Singaporean students' experiences of flow in the primary and secondary school music classroom

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Declaration of own work

I, Hoo Cher Liek, hereby declare that the work presented in this thesis is my own. Where it has been taken from other sources, I confirm that they have been duly acknowledged.

Signed: 

ABSTRACT

First articulated by American psychologist Mihaly Csikszentmihalyi in 1975, flow theory describes a state of deep involvement in an activity which is valued by the person doing it for its own sake and has an element of challenge. With its strong association with intrinsic motivation and enjoyment, flow can potentially play an important role in the Singapore education system as it embarks on the 'learn for life' phase to encourage and cultivate a mentality of lifelong learning in students. Flow is particularly relevant in music education as research had shown that music, being an inherently enjoyable activity, has an affinity with flow. This study therefore sought to examine and understand the flow experiences of Singaporean primary and secondary school students in the context of their school music classroom. The main objectives of the study were twofold: firstly, to determine if Singaporean students experienced flow during their school music classes, and if so, what the nature of their flow experiences were. In addition, the study sought to explore if the flow experiences of students with and without additional music training differed, and if so, how. The findings could then potentially inform practices and strategies to engender flow in the music classroom to realise the synergies between flow and music to improve students' dispositions towards music learning.

The sample was made up of 310 primary five (year 5) students from three primary schools and 100 secondary one (year 7) students from three secondary schools. A mixed method approach was adopted for the study to build a multi-faceted perspective of the students' flow experiences by triangulating data from different sources. This involved the collection of quantitative data using a questionnaire and qualitative data through focus groups and video observations. The findings showed that the nine dimensions of flow could be mapped to the students' experiences, indicating that they enjoyed flow-like experiences. Strongly characterised by enjoyment, the students' experiences were generally positive, although the apparent prominence of some flow dimensions over others appeared to lend credence to the view that there were different nuances of flow and these impacted how students experienced flow. In particular, the relative weakness of challenge-skill balance in the students' experiences could have resulted in their adopting a 'relaxed' attitude towards musical learning, which would not be conducive to cultivating a mindset of lifelong learning in students. The implication was that stronger elements of challenge needed to be planned in the classroom activities in order to bring about students'

musical growth through their enjoyment of the process of continually overcoming musical challenges to develop their intrinsic motivation to want to learn music. There was also a need to enable greater student autonomy and ownership in the music learning process to better facilitate flow.

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IMPACT STATEMENT

This research study explored the flow experiences of Singaporean students in the primary five and secondary one (10-11 and 12-13 years old respectively) school music classrooms. The key objectives were twofold: to determine if the students did experience flow, and if so, the nature of those experiences.

Flow has been extensively researched in the music domain. According to Tan and Sin (2019), a total of 95 such studies published in English had been conducted between 1998 and the first quarter of 2019, mainly comprising journal articles and book chapters. Based on their findings, the vast majority of these studies focused on people who could be considered to have a certain level of musical ability, e.g., professional and amateur musicians, conservatory students and school-going children (up to secondary or high school) who had undergone some form of formal musical training beyond the school classroom. There were very few studies exploring flow in school-going students whose only music learning experiences comprised lessons mandated in the school (in the case of Singapore, the national) curriculum, and even fewer investigating the nature of their flow experiences. A mixed method approach was adopted in the design of this research, operationalised through multiple approaches to examining the student experiences viz a quantitative questionnaire, focus groups and video observations of music lessons. This multi-pronged approach provided both breadth and depth to the findings to enhance our understanding of students' flow experiences in the regular music classroom in terms of its nine dimensions of challenge-skill balance, clear goals, unambiguous feedback, concentration, action-awareness merging, loss of self-consciousness, sense of control, time transformation and autotelic experiences.

This study has added impetus in the form of Singapore's recently declared national educational agenda of encouraging lifelong learning. It was hoped that in the context of music education, flow could be harnessed to synergise with inherently enjoyable qualities of music to encourage and cultivate stronger long term student interest and engagement in music.

The study found that both the primary and secondary school students experienced some form of flow, revealing that the students generally enjoyed music and manifested some intrinsic motivation to take part in music lessons and musical learning activities (autotelic experiences). While this underlined the potential for flow to be utilised in the classroom to enhance student learning and engagement, the

opportunities for flow to be facilitated were not optimised. Students generally found musical activities not to be challenging and perceived music classes as a time of relaxation (weak challenge-skill balance). While strong teacher influences led to clearer classroom guidance (clear goals and unambiguous feedback), this also resulted in weaker student-centricity (sense of control).

The potential impact of this study can be set out as follows:

1. As flow and its inherent element of enjoyment has been found to have a positive impact on student learning (see e.g. Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003), the findings of the study can potentially inform the development of student-centric pedagogies and classroom practices that can bring about stronger intrinsic motivation in musical learning. In the Singaporean education context, this could support the national agenda of encouraging lifelong learning and engagement in the music domain.
2. The intent behind this study in examining and understanding the students' musical learning experiences via the nine flow dimensions could allow for deeper insights into how students experienced flow. While many studies have found the intrinsically rewarding characteristics of flow and its connection to optimal experiences to be convincing raisons d'être and recommended its incorporation in musical learning, the understanding gleaned through this study could go one step further in shedding light on how music educators could leverage on its dimensions to more intentionally facilitate flow in the music classroom.
3. As this study focused on the experiences of ordinary, and not musically talented students, musical teaching pedagogies or practices developed and found to be effective can have a very wide impact and broad application in the classrooms of Singaporean schools through incorporation in the national curriculum and teacher training, both pre- and in-service.
4. Following from Points (1), (2) and (3), there is the potential for effective flow-based pedagogies and practices developed for musical learning to be transferred and adapted to the teaching and learning of other subjects in school. Any benefit of a flow-based approach to learning can then be further extended.
5. In the context of flow research, it is hoped that this study can encourage more interest in music education researchers to conduct studies on the flow experiences of regular students rather than the current apparent focus on those who are already musically trained. A better understanding of flow as experienced

by regular students (as opposed to a narrower sample) is more likely to have wider potential implications as they could apply to a bigger student population.

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CHAPTER 1 – INTRODUCTION

1.1 BACKGROUND AND RESEARCH INTEREST

My interest in music education comes as result of 15 years in its service (as at the start of my PhD studies), first as a secondary school classroom music teacher, subsequently and most recently as a music administrator with the Ministry of Education of Singapore (MOE). As a music specialist, firstly with the Co-Curricular Activities Branch and, subsequently with its successor organisation, the Arts Education Branch of MOE, one of my responsibilities was to look into music talent development programmes for students. In the process of developing the MOE framework, my colleagues and I came across Treffinger's levels of service approach (Treffinger, 1998), which advocated the equal importance of developing talents at all levels by providing developmental programmes commensurate to student ability, potential and/or interest. Applicable to all learning contexts, this inclusive approach was refreshing when compared to most other talent development literature that focused on developing only those considered as 'gifted' (see e.g. Bloom, 1985; Gagné, 1985; Renzulli, 1998). The underlying assumption was that all students had some potential for musical development and it was the responsibility of music educators to provide accordingly (see in general Sloboda, Davidson, & Howe, 1994)[1].

This resonated with my personal experience and values during my stint as a classroom music teacher, where I saw students with good musical potential or interest not realised, because the system provided few avenues or encouragement for their further development. Conversely, in my experiences managing national-level music talent development programmes, I came across students on the opposite end of the spectrum who were intrinsically motivated in their pursuit of musical excellence and wondered whether the average student could somehow also be imbued with some measure of their desire to learn music and enhance their musical skills. Beyond simply providing policies, programmes and platforms, there also loomed the larger question, of how and what motivated students to want to be musically engaged in the first place, and how students from both ends of the motivational spectrum could be nurtured into a lifelong engagement in music. It was thus that I became interested in the topic of motivation in the context of music education.

1. Interestingly, Gagné subsequently evolved his Differentiated Model of Giftedness and Talents from a model of giftedness to a developmental model for talents (Gagné, 2004).

1.2 MUSIC EDUCATION IN SINGAPORE

Being a former British colony, Singapore inherited many features from the British education system. In the system of formal schooling following the national curriculum, students typically go through six years of primary school education, after which they sit for the milestone Primary School Leaving Examinations (PSLE), followed by 4-5 years of secondary school education, leading to the General Certificate of Education (GCE) O-level examinations. Around 30-40% of each cohort then go through an additional 2-3 years of pre-university education before sitting for the GCE A-level examinations or International Baccalaureate, and then to university. The aforementioned educational pathway is referred to in Singapore as the formal schooling system and comes directly under the purview of MOE.

In schools, music education takes place in two settings. Music is typically a non-examinable compulsory subject for all six years of primary and the first two years of secondary school and is allocated a minimum of either 60 minutes (primary 1-4) or 30 minutes (all other levels) of classroom time per week. This formal aspect of the music education that is taught during curriculum time is commonly referred to as the primary and lower secondary music syllabus (hereinafter 'music syllabus' for short). While most of these lessons are taught by certified music teachers (i.e. they have gone through the only recognised national teacher certification programme at the National Institute of Education and trained in music teaching), there is an increasing trend of schools employing freelance, uncertified but musically-qualified instructors with specialised skills in order to provide a wider range of programmes for students (for an overview of the music education landscape in Singapore and its history, see Stead & Lum, 2014). Outside the music syllabus, students may choose to join formal after-school music performing arts co-curricular activities (CCAs; formerly referred to as extra-curricular activities or ECAs) such as a wind band, choir, Chinese orchestra or instrumental ensemble. The music CCA programmes are led and taught largely by freelance specialist instructors hired by the school and meet about 1-2 times per week for a total of 2-6 hours. CCAs are available through all levels of schooling, allowing students to pursue their musical interest through the different schooling stages. As a policy, CCA participation is mandatory for secondary school students and encouraged for students at the primary school and pre-university levels.

Outside of school, many students from families with the means also take private music lessons, usually learning the piano or violin, and then sit for practical

and theory exams conducted by the Associated Board of the Royal Schools of Music (ABRSM). For these and other students with music knowledge and experience, there is the additional option of joining the Music Elective Programme (MEP), or the O- and A-level programmes in music. Available at the secondary level and only in certain designated schools, these studies cater to students who are interested in taking music as an examinable academic subject.

1.3 MUSIC EDUCATION ISSUES IN SINGAPORE

In Singapore, as in many countries around the world, there is a general apathy towards music education, an issue that will be further explored in the Literature Review section under the sub-heading, *Motivation in the context of music education in schools*. I perceive that there are many possible reasons for this.

Firstly, there is a general lack of employment opportunities open to musicians, other than becoming either classroom or freelance music teachers, or teachers in private music schools. In terms of job openings for Singaporean professional musicians, there are only two professional orchestras in Singapore, namely the Singapore Symphony Orchestra, and the Singapore Chinese Orchestra. Competition for admission into both is highly competitive as places are few and musicians from other countries also come into the equation, further limiting employment prospects. While there are also professional military bands in the armed forces and police force, they are not seen as having the same musical status and therefore not as appealing to most 'classically-trained' musicians. For composers, the situation is no better, as opportunities for commissions are few and the general demand for new music low, though the situation is slowly starting to change due to an increasingly vibrant music scene. This is linked to the recent formation of more semi-professional music groups due to more students graduating with higher education qualifications in music.

Secondly, as a country heavily influenced by Asian (Confucian) values, jobs in the music or arts sector are not seen as being of 'high' social status or prestige, therefore children interested in music are not given great, if any, encouragement by their parents or even teachers to take up tertiary music studies with a music career in mind. Academic achievement in traditional subjects such as maths and the sciences are most highly valued and seen as a stepping-stone to a good professional career in medicine, law, engineering or the civil service. As such, the extent to which most parents are prepared to involve their children in music outside school is to send them for the ABRSM exams, not to cultivate or affirm any interest in music, but to shore up

their CVs to aid them in future applications for scholarships or admissions into prestigious schools. In this regard, parallels can be drawn from the Hong Kong music education context as articulated by Leung and McPherson (2011), where the authors elaborated on the cultural and achievement behaviour of Hong Kong students. Hong Kong is a suitable model for comparison with Singapore due to their many cultural and historical similarities, such as a predominantly Chinese population, strong Asian values emphasising academic achievement in education above all, and as former crown colonies, inheriting a largely British system of education.

Thirdly, there is the perennial perception that learning music is 'good to have' but not necessary, as compared to other academic subjects such as math or sciences or languages, which equip students with skills and knowledge that have more practical uses or lead to better employment prospects (Csikszentmihalyi & Schiefele, 1992). In addition to the unfavourable perceptions parents have of music already mentioned, music teachers in Singaporean schools constantly find their fellow educators encroaching on their already limited curriculum time and must fight a perpetual war against prevalent mental models of music education among school management that relegate its importance to an afterthought.

Faced with such an unencouraging landscape, it is hardly surprising that most students in Singaporean schools treat learning music as nothing more than a distraction from their academics or as a form of relaxation at best – music is the only lesson in school that is taught in a special air-conditioned classroom in hot and humid Singapore. While it may not be feasible to change the mindset of society at large, it is still possible for music educators to try to influence students' perceptions and attitudes towards music and thereby enhance their motivation to want to learn music or at least interest to be engaged in musical activities. In her survey of research literature, (Hallam, 2015) found that active engagement with music can lead to a wide range of benefits such as enhancing creativity, aural and perception skills, as well as literary skills, to mention but a few. At the national level in Singapore, sustaining a lifelong musical (and hence arts) engagement has also been identified as one of the strategic thrusts in the Report of the Arts and Culture Strategic Review (Ministry of Information, Communication and the Arts, 2012). The importance of lifelong learning and engagement was further affirmed when the Minister for Education of Singapore announced recently announced the start of the 'learn for life' phase of education, which is focused on cultivating in students a positive disposition towards continuous learning in life to ensure that education will

always remain an uplifting force in society (Opening Address by Mr. Ong Ye Kung, then Minister for Education at the Schools Workplan Seminar, 28 September 2018). A strong case can therefore be made for greater attention to be paid to the delivery of music education both to realise its potentially wide-ranging benefits as well as fulfil the national aspirations for music and the arts.

The latent interest in music is there: almost all students (and indeed just about everyone) enjoy listening to some kind of music. One of the key issues as noted by Green (2002) is that the advancements in recording and sound reproduction technology has made music all too accessible, transforming the music industry to one more focused on music consumption than creation, which has resulted in people's general reluctance to directly engage in music-making. The challenge for music education is how that latent interest can be harnessed and translated to a greater willingness to participate in school-level musical activities (see in general McPherson, Davidson, & Faulkner, 2012, chapter 1). The wider objective would be to engage students in active music-making to inculcate a lifelong active (as opposed to passive) interest in music. While not everyone will eventually take up a music-related career, at the very least they can still participate in the development of the cultural life of the nation by becoming part of interested and informed audiences needed to sustain the long-term cultural growth of the nation.

1.4 CONCLUDING REMARKS

Based on my understanding of the music education context in Singapore as delineated in the preceding paragraphs, I believe that in order to enhance student engagement in music in schools, an issue that needs to be addressed is how to spark their inherent interest in music, thereby encouraging them to learn music and/or to engage in musical activities in the longer term. In this regard, flow theory provides a possible solution as a means of cultivating that latent musical interest in students beyond mere passive music consumption. First espoused by American psychologist Mihaly Csikszentmihalyi (1975), flow describes a state of deep engagement in an activity in which there was an element of challenge with enjoyment being the outcome. Researching in the late 60s and early 70s, Csikszentmihalyi was concerned that in a world with finite resources where people focused on extrinsic rewards (and hence extrinsic motivation), there would come a day when the value of rewards diminished to the point where there was no longer the motivation for people to better themselves. His proposed solution was to look for

alternative ways of engaging people in their daily activities to find greater meaning and purpose therein so that they would become more deeply invested in those activities and through that, derive greater intrinsic motivation to become better human beings. Flow theory and its potential application in music education will be further elaborated in the Literature Review chapter.

For most students in the Singaporean context, their only encounter with formal music education comes during their eight years (Primary 1 to Secondary 2) going through the music syllabus, hence it is the area which I believe holds the highest potential as a leverage point in terms of influencing students' perceptions of music and music-making. While the window of opportunity is small due to the limited curriculum time allocated to the music syllabus, it is nonetheless a precious one and if careful thought is given to the approach and design of students' musical learning and experiences during this period of time, it may be possible to maximise the impact of music education to cultivate longer-term interest and musical engagement. This research is especially timely as the Singapore education system enters the 'learn for life' phase. In this context, developing and leveraging on sources of motivation such as flow will be critical in developing in students not just the need to continually upgrade themselves, but also to pursue their lifelong interest in music.

1.5 STRUCTURE OF THESIS

In this chapter I have elaborated the origins and motivations behind my embarking on this research. In Chapter 2, I review the literature on theories of motivation to give context to its importance in the education context before going on to the literature on flow research in music and music education which will ground the study. The chapter ends with the distillation of the research questions. Chapter 3 sets out my epistemological considerations in coming up with the research design and methodology. The design and trialling process of the research instrument and data collection processes are also detailed. Chapters 4-8 contain the findings from the different data collected and analytical approaches used in this study. Chapter 4 sets out the quantitative analysis findings from the research questionnaire and Chapter 8, the findings from the factor analysis conducted on the quantitative data. Chapters 5 and 6 provide an insight into the everyday experiences of primary and secondary school students respectively in the music classroom in Singapore as articulated in focus groups conducted with them, and through that, a glimpse into their flow experiences. With student self-reporting the key data collected thus far,

Chapter 7 then provides a more objective lens through video observations of actual music lessons conducted in primary and secondary school music classrooms. Finally, in Chapter 9 I bring together and consider the different findings in the light of extant literature to present my conclusions for the research, their possible importance and impact on music education, as well as some limitations.

CHAPTER 2 – LITERATURE REVIEW

2.1 INTRODUCTION

In 1975, American psychologist Mihaly Csikszentmihalyi articulated his theory of flow (Csikszentmihalyi, 1975), challenging the established behaviour-centric paradigm of motivation and presenting a humanistic model of motivation that went beyond the mere satisfaction of needs, but as being key to human flourishing. This chapter begins with a brief overview of the motivation paradigm prior to the emergence of flow theory. As this research is focused on music education, the next section reviews how motivation has been applied to support musical learning and its increasing importance in the current context of lacklustre interest in musical learning among students. Flow theory as the overarching theory guiding this research is introduced, mainly due to its strong inherent element of intrinsic motivation and affinity with and potential to cultivate a longer-term engagement in music. The nature of flow is then examined and alternative views of the flow experience that have emerged from research studies over the years are presented to provide a more nuanced understanding of flow. Flow is then examined in the music education context, and how its potential for human betterment has been used to form the basis of music education. The final section looks at how flow research has been conducted in music education to better understand its potential impact in musical learning. The chapter ends with a distillation of the research questions for the research.

2.2 TRADITIONAL VIEW OF MOTIVATION

Motivation is usefully defined by Wentzel and Brophy (2014) as follows:

> *"At the most general level, motivation is a theoretical construct used to explain the initiation, direction, intensity, persistence, and quality of behavior, especially goal-directed behavior. Motives are hypothetical constructs used to provide general reasons for why people do what they do. Motives typically refer to relatively general needs that energize people to initiate purposeful action sequences, such as hunger, a need for social acceptance, or a need to satisfy curiosity. Motives are distinguished from goals… and strategies…" (p2-3)*

Traditionally, motivation has been most commonly thought of as being derived in two ways: it can either be intrinsic, i.e. internally driven due to the inherent enjoyment or value of the activity as perceived by the individual; or extrinsic, i.e. driven by external factors such as rewards or disincentives (Lehmann, Sloboda, & Woody, 2007). While it is generally accepted that intrinsic motivation serves as a much more powerful driving force behind goal-oriented behaviour (see e.g.

Csikszentmihalyi, 1978; Remedios & McLellan, 2009; Ryan & Deci, 2000b), extrinsic motivation can also be important in influencing behaviour. Extrinsic motivation can be positive, most commonly in the form of rewards provided for the successful completion of the activity; or negative, i.e. the activity is undertaken in response to the desire to avoid unpleasant consequences. Beyond rewards, an environment in which the individual enjoys strong family support, the guidance of good teachers and affirmation of his achievements can also provide strong extrinsic motivation to persevere with specific activities, especially when paired with a positive disposition (Evans & McPherson, 2014; Howe & Sloboda, 1991). A mix of intrinsic and extrinsic factors is therefore usually needed to ensure a prolonged desire to continue with the activity (Bloom, 1985; Lehmann et al., 2007) .

It was in this context of motivation seen as a dichotomy of intrinsic and extrinsic motivation that flow theory was first conceived as key to human betterment and advancement (Csikszentmihalyi, 1975, 1990).

Csikszentmihalyi found in his extensive research studies on people in various professions, games and pursuits that when they had sufficient skill to meet the challenge of an activity in their chosen field, they sometimes experienced a deep state of engagement and enjoyment during the activity which motivated them to continue with and complete it in spite of the difficulty involved. He called the phenomenon ‘flow’ (Csikszentmihalyi, 1975) . He also found that having succeeded in overcoming the initial challenge, the promise of more enjoyable (flow) experiences was a sufficiently powerful intrinsic motivator to drive the participants to seek increasingly higher challenges in order to experience the feeling of enjoyment again. These enjoyable experiences, called ‘autotelic experiences’ by Csikszentmihalyi, inspired the dedication the participants had for their chosen activities. Through their continued quest to be better in their chosen field, they experienced psychological growth or complexity, which was seen as a key component of human growth, while the enjoyment experienced was seen as a predictor of a better life (Csikszentmihalyi, 1990).

The more recent development of self-determination theory (SDT) marked an evolution in the classic intrinsic-extrinsic dichotomous view of motivation, suggesting motivation was more a continuum than dialectic. Proponents of SDT believed that extrinsic motivation could be influenced by the level of autonomy in deciding on the task. When a high form of “self-determined extrinsic motivation” influenced action, it closely approximated intrinsic motivation owing to the person exercising a conscious

choice to perform a task because of the internalisation of extrinsic factors deemed important by the individual (Deci & Ryan, 2008; Ryan & Deci, 2000a). This dimension of motivation was useful in explaining high motivation levels for unpleasant or difficult tasks in which intrinsic motivation may be lacking. This meant that extrinsic motivation could still serve as a powerful enabler when cultivated appropriately to give individuals greater autonomy when there was a need to perform tasks that may be beneficial but not found to be inherently interesting or enjoyable (Deci & Ryan, 2008). A good example of this is musical practice. All musicians need to undergo many hours of practice in order to achieve and maintain high levels of performance. However even top classical musicians have ironically admitted that they do not enjoy practising but they do so in order to achieve their musical goals (Lehmann et al., 2007). In this case they have internalised the importance of deliberate practice and therefore chosen to practise willingly and without need for additional incentive. High levels of extrinsic motivation due to internalisation of external factors as articulated in SDT has also been found to be strongly correlated with flow (Kowal & Fortier, 1999; Valenzuela, Codina, & Pestana, 2018) underlining the importance of autonomy in flow and demonstrating that extrinsic motivation (albeit at high levels) was also capable of generating flow.

The concept and nature of flow will be discussed in greater detail in a later section of the literature review.

2.3 MOTIVATION IN THE CONTEXT OF MUSIC EDUCATION IN SCHOOLS

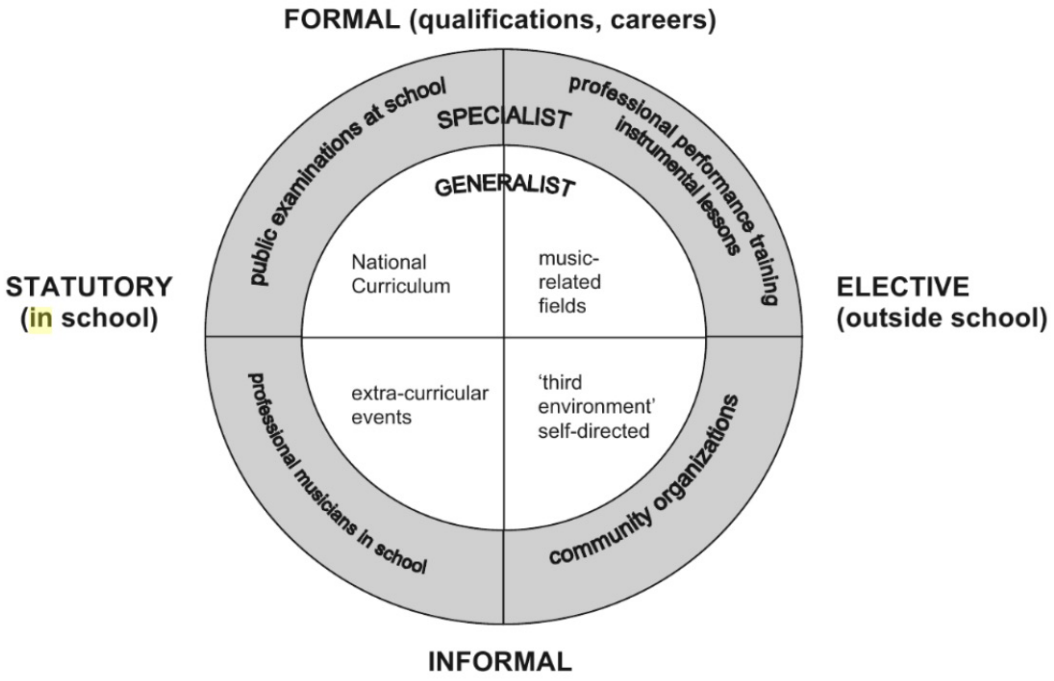
Historically, education in general has been delivered in a formal and structured manner in schools and classrooms. Calling it “schooling”, Jorgensen (1997) described its key features succinctly:

> *“…It has become customary to associate schooling more restrictively with what happens in state-operated schools modeled internationally on Western elementary and secondary state schools. These schools are typically organized into classes, governed by administrators, and taught by state-certified professional teachers according to set curricula, with stipulated times and places of instruction. Instruction is predominantly formal, laid out within the school timetable, and more or less allows extracurricular activities. Students are generally taught in teacher directed groups. Student-initiated learning projects and tutorials for individual students are less common. School administrators, teachers, and students have clearly defined roles that evidence remarkable consistency cross-culturally.” (Jorgensen, 1997 p4-5)*

Treated as a subject taught in the classroom, Green (2002) noted that the above western mode of delivery of music education in schools was widely practised around the world, including in Singapore.

Building on the work done by David Hargreaves in the 1990s North and Hargreaves (2008), developed the Globe Model of Opportunities in Music Education to rationalise the different contexts and settings in which music education can take place for students (Figure 2.1). This can be a useful starting point for my discussion of motivation in music education.

Figure 2.1: Globe Model of Opportunities in Music Education (North & Hargreaves, 2008 p340)



As the model illustrates, students may learn music in either the generalist or specialist contexts. The generalist context applies for students who are engaged in music typically at a basic level either as mandated by the education system or by choice, most likely acquiring basic music literacy, knowledge and instrumental skills. In the specialist context, the students choose or are sometimes identified to participate in programmes that are focused on the acquisition of higher-level instrumental skills and/or musical knowledge that may eventually lead to admission to tertiary-level studies at music schools or conservatories (Hargreaves, 1996). Viewed from the perspective of formal school-based music education, the authors

argued that all students should be provided with opportunities for musical development in either context:

> *"…music is something to be participated in by everyone, and across the lifespan. It should no longer be the specialized territory of a small number of experts or professionals with highly specialized and cultivated sills, but something accessible to all. The implication is that we need to* ***apply*** *educational thinking to those areas of life in which music occurs… By doing so, music educators can capitalize on the power of music to promote the emotional, social, and cognitive development of pupils of all ages." (North & Hargreaves, 2008, emphasis in original)*

Hargreaves stressed that music education in both contexts should be taken seriously with equal purpose (Hargreaves, 1996). However, he was also quick to warn against an over-simplification of the generalist-specialist dichotomy (Hargreaves, 1996 p150-151), cautioning that this distinction was intended as a convenient way of studying differing learning contexts, and not as a means of categorising students into those who were 'talented' or 'not talented' in music.

Research appeared to show that students in the specialist context who had aspirations or had chosen to pursue musical studies at conservatory or tertiary level, were generally more self-motivated and over time acquired greater self-efficacy and self-concept, both of which have an important impact on their continued motivation to improve and hence future success (Ho & Chong, 2010; Leung & McPherson, 2011; Sloboda & Davidson, 1996). Self-efficacy refers to the individual's belief in his/her ability to choose and execute the actions needed to achieve his/her goals, while self-concept refers to the individual's perception of his/her own abilities (Hallam, 2009; O'Neill & McPherson, 2002). For example, in a case study by Ho and Chong (2010) of a highly talented young pianist in Singapore, the researchers reported that she had a good appreciation of her talent for music and had decided that she wanted to become a concert pianist at a very young age. This had motivated her to practise as much as six hours a day, despite also having to balance the demands of school. Similarly, in their study of the motivations of high music achievers in Hong Kong primary and secondary schools, Leung and McPherson (2011) found that over time, these students became less reliant on external factors such as parents and teachers and developed greater intrinsic motivation to achieve their musical goals and strive towards better performance levels, even if some of them did not intend to eventually pursue higher-level music studies. In a research study on aspiring music students in the UK by Sloboda and Davidson (1996), the researchers found that the high achievers exhibited greater intrinsic motivation and a willingness to practise even

outside teacher supervision, often practising twice as much as the moderate achievers and up to eight times as much as those that subsequently gave up. The findings of the above cited research studies affirm the greater intrinsic motivation of students in the specialist context, evidenced particularly by their willingness to put in hard practice hours.

2.4 MOTIVATIONAL CHALLENGE FOR MUSIC EDUCATION

However, students in the specialist context are in the minority; the generalist context is where the vast majority of students learning music are found. From the Globe Model, their interactions with music mainly take place in the school music classroom or in the form of school-based music extra-curricular activities (or co-curricular activities in Singapore), or when they take part in community-based or private musical activities outside of school. In this context, the motivation levels of students may vary considerably owing to a diversity of attitudes and reasons both musical and non-musical.

Recent literature suggests there is currently a low, even declining level of interest in music as a subject in schools, both in the specialist, but especially in the generalist contexts (Byrne & Sheridan, 2000; Green & Hale, 2011; Leung & McPherson, 2011; Lowe, 2011; McEwan, 2013; Ng & Hartwig, 2011; Sloboda, 2001). Green (2002) noted the irony that while music education is more accessible than ever, the number of people in the UK actively engaged in music post-education is also lower than ever. Bray (2000) proffered a number of reasons for this, such as music taught in schools not being seen as catering to the interests of students (a point Sloboda also made) and music not being regarded as important by parents and non-music teachers, a perception that is then reinforced in students.

The view of students' generally low or declining motivation to learn music was also supported in a large-scale international quantitative study. Conducted by McPherson and colleagues, the study involved over 24,000 students across elementary and high schools in eight countries (Brazil, China, Finland, Hong Kong, Israel, Korea, Mexico and the USA), focusing on students' competency beliefs and perceived value of a range of subjects in school including music (findings summarised in McPherson & O'Neill, 2010). The researchers found that students in all the countries except Brazil had generally low competency beliefs for music as compared to other academic subjects such as maths, science and mother tongue, and hence were not as motivated to learn music. However, students engaged in

advanced music studies were found to have higher competency beliefs, and hence more motivated. This was deemed the case for Brazil as music was not offered in all Brazilian schools, hence the students in those that did (and were sampled) were more likely to have higher competency beliefs as they had chosen the schools due to the availability of music programmes. They further found that the students' perceived value of music declined as they progressed through school. This last finding was also corroborated in a study by Lowe (2011) on secondary one students in Western Australia, who found that while enjoyment was a key motivating factor at the primary school level, by secondary school, more pragmatic attitudes vis-à-vis a greater focus on doing well in academics had taken root in students.

A further reason explaining the declining interest in music was proffered by Green (2002), who noted that the proliferation and widespread consumption of popular music had led to an estrangement from the western classical music tradition mostly found in the formal music curriculum in schools. She added that the lack of interest in what was taught in the classroom was further exacerbated by the fact that the pop musicians who created the music favoured by students were themselves mostly not classically trained and hence wrote music not of the classical genre. The disconnect for students between their preferred music and what was taught in the classroom was also reflected in a study by Welch and Ockelford (2009). They found in their interview with 44 secondary school students that only the minority who were already classically trained or possessed musical skills identified themselves with the music taught in the classroom. The majority was found to be disengaged as they lacked the skills, could not identify themselves with what was taught or did not find it relevant to their needs even though some of them could be considered as competent musicians.

However, research has shown that when students participate in musical activities, they experience more enjoyment than when they do academic subjects such as maths and science. In a longitudinal research study conducted by Csikszentmihalyi and Schiefele (1992) on students considered to be gifted in music, art, science and maths, they found that all of them, including the students gifted in science and maths, enjoyed more positive experiences when they were engaged in music and art than in science or maths. The researchers postulated that this may be because academic subjects such as maths and science were seen as necessary for future employment (extrinsic motivation), while music and art, having albeit more limited prospects, provided enjoyment (intrinsic motivation). This refers back to the

earlier point made about self-determined extrinsic motivation and the internalisation of important external goals, highlighted by Ryan and Deci (2000b), which would mostly explain the motivation of the students gifted in maths and science in terms of their desire to do well in those subjects in order to improve their future career prospects.

In summary, there is a belief that music is an enjoyable activity and experience (Lehmann et al., 2007) and as such, the low level of interest in music learning revealed by extant literature seemed counter-intuitive. The issue may be that current music education approaches and pedagogies do not sufficiently tap into music's inherent capacity to delight and hence inspire a greater interest to learn or engage with it.

2.4.1 Informal music learning

In the preceding paragraphs, I have highlighted a number of reasons for the lack of interest in music learning in the 'formal' classroom-based teacher-centric learning context prevalent in schools (North & Hargreaves, 2008). One proposed solution to the disconnect and de-motivation of students in the generalist context is the adoption of informal music learning processes. Studying this alternative form of acquiring musical skills and knowledge, Lucy Green (2002) first articulated its nature and potential application in the classroom, which:

> *"…share few or none of the defining features of formal music education… young musicians largely teach themselves or 'pick up' skills and knowledge, usually with the help or encouragement of their family and peers, by watching and imitating musicians around them and by making reference to recordings or performances and other live events involving their chosen music." (p5)*

In his study of extant research on formal and informal learning in music, Folkestad (2006) noted that whereas for formal learning, the focus was on learning how to play the music, informal learning was more about playing the music. Citing Jorgensen's five concepts of music learning (namely schooling, training, eduction, socialisation and enculturation), he noted that of the five, schooling and training clearly referred to formal learning while socialisation and enculturation were more closely associated with informal learning (Jorgensen, 1997). He concurred with Green (2002) that the two should not be seen as irreconcilable opposites but as markers for a pedagogical continuum that music educators should take advantage of and apply as best suited the situation.

As discussed earlier, enjoyment can be a powerful motivating factor, and when students have control or autonomy over the musical activities they want to do, they are known to be more motivated and do it better than when they was decided for them (Csikszentmihalyi, Rathunde, & Whalen, 1993; O'Neill & McPherson, 2002; Rusinek, 2008). There is therefore support for the notion that informal learning can enhance motivation, due to its association with enjoyment and the greater control students have over their learning (Hallam, Creech, & McQueen, 2011). Synthesising the ideas of Green and critical theorist Paolo Freire (Freire, 1970), Narita (2017) further theorised that informal music learning approaches had the potential to achieve what she called 'liberating music education' (p38), which would enable both the teacher and learner to transform their knowledge through a deliberate pedagogical process of the teacher applying his/her authority, practical musicianship and taking cognisance of his/her relationship with learners' musical worlds. There was therefore much to commend for the broad adoption of informal learning practices in music education.

While the adoption of informal musical learning practices had been held up as a possible solution to the problem of motivation in the music classroom, it also had its limitations. These included a tendency towards a narrow focus on pop music due to students' interest, limited learning experiences due to students learning what they like and a lack of musical depth in what they learn (Jenkins, 2011) and as such, it cannot wholly replace formal learning. In Singapore, there had been some attempt to bring informal music practices into the music classroom by the Singapore Teachers' Academy of the ARts (STAR), MOE's in-service training academy for music and visual art teachers through in-service teacher training. In spite of this, it was noted that many Singaporean music teachers did not adopt informal music learning approaches due to a lack of confidence in the use of popular music learning pedagogies (Ng, 2020). As noted by O'Neill (2014) implementing the kinds of learner-centred activities in informal learning was often a difficult task.

In summary, while informal learning approaches could motivate students in the music classroom due its association with student autonomy and enjoyment, its inherent limitations to musical learning and general teacher discomfort with its pedagogies limited its widespread adoption. Beyond informal musical learning approaches, how can a more pervasive sense of enjoyment be brought to the music classroom to both cultivate and sustain students' motivation and interest in musical

learning and engagement? Another possible solution could be found in Csikszentmihalyi's concept of flow with its organic element of enjoyment.

2.5 FLOW

I had earlier discussed Csikszentmihalyi's concept of enjoyment in flow theory and how it was symptomatic of personal growth. In the arts context, Csikszentmihalyi and Schiefele (1992) argued in support of a greater emphasis on arts education in schools, believing that it had "…possible value for human evolution and for the development of the individual human being" (p170). They theorised that the arts, with its vivid depiction of life, was a rich medium through which one could gain greater wisdom either through creating or interacting with it. They argued that the sciences and math, with their focus on the acquisition of rational knowledge, were not the most appropriate mediums for attaining the insights needed to better understand life and thus, in their view, a balance needed to be struck between arts and sciences education. From this perspective, both sciences education and arts education serve distinct and complementary purposes: whereas rational knowledge is seen as a means to achieving an end or external good, arts experiences are an end in themselves through the enjoyment in engaging with the artwork and the insights into life gained, which directly contribute to an enhanced quality of life. They used as the basis of their research the theory of flow (Csikszentmihalyi, 1975, 1990).

To support their contentions, Csikszentmihalyi and Schiefele (1992) examined the quality of experiences of four groups of high school students identified as gifted in math, science, music and art. The researchers framed their research through the lens of flow, using the Experience Sampling Method (ESM) to measure the quality of experiences of the students. This methodology involved the participating students completing detailed questionnaires at eight random times throughout the day over a one-week period. The responses required the students inter alia to indicate what they were doing, where they were, what they were thinking about and how they were feeling, which enabled the researchers to capture rich details representing the students' quality of experiences throughout the day. Using the rating scales in the questionnaires, the researchers were able to translate the students' quality of experiences into scores. They then compared the students' scores for the time they were engaged in lessons for their respective talent areas with their weekly average scores to see if they found the lessons in their talent areas more enjoyable than their average weekly experience. They found that the music and art students reported

higher scores (i.e. better quality of experience and higher levels of enjoyment) during the lesson time for their art and music lessons than compared to their weekly scores, while the science and math students reported lower scores during lesson time for their talent areas than their weekly scores. This would seem to imply that the science and math students had less enjoyment during science and math classes than compared to their weekly average. Conversely, when the music and art students were doing math and science, they reported scores lower than their weekly average, i.e. there was less enjoyment, while the science and math students reported generally higher scores when doing music and art as compared to their weekly average, i.e. they found music and art classes more enjoyable than their science and math classes.

Based on these findings, Csikszentmihalyi and Schiefele (1992) concluded that participation in music and art was more enjoyable and more conducive to flow and intrinsically rewarding, whereas the more academic math and science lessons saw less flow and were not comparatively as enjoyable or immediately gratifying. Further interviewing the students, they also found that the math and science groups frequently experienced anxiety while the music and art groups generally experienced flow (and hence enjoyment) when engaged in their respective talent areas. They found in general that students in the music and art groups were more intrinsically motivated to work hard to do well in their respective areas due to the enjoyment from the flow experiences and liking for the arts. Though there was also strong motivation to do well in science and math, it was found to be more extrinsic (self-determined) in nature, driven by the students' belief that they could improve their future prospects in spite of there being less enjoyment (flow) in the learning process.

In spite of the findings, it is worth noting that Csikszentmihalyi and Schiefele (1992 p180) admitted that the lack of enjoyment in math and science classes compared to the art and music classes could be due to "…a function of their [the subjects] nature", i.e. the more academic and outcome-biased nature of math and science education informed the manner of its teaching, which was more pragmatic and therefore less conducive to flow. The researchers also did not investigate if there was any 'teacher effect' on the outcome, though it seemed likely that the nature of the subjects would also inform the teachers' pedagogy. Nevertheless, the study provided some measure of empirical affirmation of the belief that music is inherently enjoyable through its natural affinity to flow experiences.

2.5.1 The nature of flow

The nature and purpose of flow can be usefully summarised in the following passage (Nakamura & Csikszentmihalyi, 2002):

> *"What constitutes a good life? Few questions are of more fundamental importance to a positive psychology. Flow theory has yielded one answer, providing an understanding of experience during which individuals are fully involved in the present moment. Viewed through the experiential lens of flow, a good life is one that is characterized by complete absorption in what one does… Flow research and theory had their origin in a desire to understand this phenomenon of intrinsically motivated, or autotelic, activity: activity rewarding in and of itself (auto = self, telos = goal), quite apart from its end product or any extrinsic good that might result from the activity." (p89; emphases in the original)*

The state of flow describes an optimal experience where there is a match between the challenge of the specific activity undertaken and the skill level of the participant and can occur in the course of almost any activity and at any level of challenge (Csikszentmihalyi, 1990). During the activity, the participant experiences deep involvement to the extent that he or she loses track of time and everything else except for the activity itself (Csikszentmihalyi et al., 1993).

In his research conducted in the late 60s and early 70s, Csikszentmihalyi held extensive interviews with a wide range of professionals (such as doctors, artists and musicians) and experts in various fields and activities (such as rock climbers, chess players and bikers) on the impetus behind their pursuits and the nature of the enjoyment they experienced. Threading together the common themes in their experiences, he found that the activities were enjoyed for the challenge they provided and pursued, not because of extrinsic rewards, but as ends in themselves and the satisfaction of having overcome the challenge was its own reward. He named the phenomenon 'flow' as it was a "…native category – a word frequently used by the informants themselves to describe the experience" (Csikszentmihalyi, 1975 p36) and he felt that it appropriately denoted the "effortless movement" (Csikszentmihalyi, 1990 p54) that they described in their experiences. Flow was also something that cut across different cultures, and not unique to western cultures, though research appears to show that how flow is experienced may vary across cultures (Moneta, 2004). He further put forward the idea that flow experiences were the key to happiness and hence a better quality of life.

The presence of flow is defined by the following nine dimensions: challenge-skill balance, clear goals, unambiguous feedback, action and awareness merging, concentration on the task at hand, sense of control, loss of self-consciousness,

transformation of time and autotelic experience (Jackson, 2012)[2]. The first three dimensions of challenge-skill balance, clear goals and unambiguous feedback can be sub-grouped as flow precedents (Beard, 2015; Jackson, 2012; Nakamura & Csikszentmihalyi, 2002), or the conditions necessary for flow to take place. The dimensions of action and awareness merging, concentration on the task at hand, sense of control, loss of self-consciousness and transformation of time can be thought of as the characteristics of the flow experience (Beard, 2015); and autotelic experience is the end result or outcome of the aforementioned eight dimensions of the flow experience (Shin, 2006). Each dimension is further elaborated below.

1. Challenge-skill balance

This is the key pre-condition of the flow experience. The level of difficulty of the activity needs to be sufficiently high for the participant and must match his or her skill level to the extent that while it poses some challenge, the participant possesses the ability to complete it. When there is high challenge met by high skill, flow takes place; when there is high challenge and low skill, anxiety is the outcome; when there is low challenge and high skill, boredom results and when there is low challenge and skill, there is apathy (Csikszentmihalyi, 1975). Recent research studies have however questioned the nuancing of challenge-skill balance, suggesting that a measure of 'imbalance' of more challenge than skill may better facilitate flow, at least in certain situations or for persons of certain dispositions (Løvoll & Vittersø, 2014; Moneta, 2004).

2. Clear goals

The participant has to have clear objectives to achieve in doing the activity. The goals themselves have no direct impact on satisfaction, but they mark out the parameters that define the flow experience and hence the enjoyment of the activity itself (Csikszentmihalyi, 1975).

3. Unambiguous feedback

During the activity, the participant receives clear feedback either from himself or herself or an external source regarding his or her progress in achieving the set goals, usually of a nature confirming that the participant is succeeding, though feedback on failure can also be important (Jackson, 1996). The type and quantity of the feedback is usually highly subjective and depends much on the participant and also on the activity.

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2. Csikszentmihalyi (1990) r only eight dimensions as he had classified 'clear goals and feedback' (at p54) as a single dimension, but it is clearer to have them as separate dimensions.

4. Action-awareness merging

The participant's attention becomes so focused on the activity that his or her actions almost seem spontaneous and automatic and he or she experiences a sense of becoming 'one' with his or her actions. Csikszentmihalyi (1975) placed great emphasis on this dimension in the flow experience, calling it "…the clearest sign of flow" (p38). Once the participant becomes conscious of his action and awareness and perceives the activity from the 'outside', flow is interrupted, which sometimes happens when the participant receives either internal or external feedback to improve. Agreeing, Quinn (2005) went one step further and opined that action-awareness merging was essentially the embodiment of flow.

5. Concentration on the task at hand

This dimension is most commonly cited among the participants in flow research (Csikszentmihalyi, 1990). The participant is so immersed in the activity that he or she is not aware of anything else around his or her environment and takes unkindly to disruptions. This is closely linked to the dimension of action-awareness merging, as any disruption in concentration is likely to affect that as well. More recently, Csikszentmihalyi seemed to regard this dimension as being the 'origin' of the other four experience dimensions (Beard, 2015 p358).

6. Sense of control

The participant has a sense of being in total control of what he or she is doing even though the external conditions may be very challenging and are in reality constraining his or her very actions. This dimension is also sometimes referred to as 'the paradox of control' (Csikszentmihalyi, 1990 p59) as in most situations, the participant is not really in control of the situation (e.g. in rock climbing), but perceives oneself to be in control and is able to act as such, which gives him or her the confidence without which he or she cannot achieve the goals. More recently, sense of control has also been linked to self-determination theory (Ryan & Deci, 2000b) in terms of the extent of the participant's autonomy in the activity, i.e., the degree to which he/she had control of the decision-making process influencing the outcomes (Valenzuela et al., 2018). This suggested that the degree of autonomy of the participant in his/her decision-making in the activity played a key role in the flow experience.

7. Loss of self-consciousness

The participant is no longer conscious of his or her 'self' and how he or she is perceived by others. In this state, the participant is doing things instinctively and

confidently, seeming to know what to do without much thought or deliberation (Jackson & Marsh, 1996).

8. Time transformation

In general, the participant's experience and perception of time is 'altered' making it seem shorter than normal. However, research participants have also reported the opposite that time seemed to pass slower when they were doing something difficult within the activity itself. What appears to cut across all accounts of this dimension in the research is that the participant are no longer bounded by the normal precepts of time (Csikszentmihalyi, 1990).

9. Autotelic experience

This dimension is the outcome of the flow experience and is strongly associated with enjoyment. Derived from the Greek words 'auto' (self) and 'telos' (goal), it means that the person is involved in the activity for its own sake, and not because of some extrinsic reward. An autotelic activity is one in which participation is its own reward and such activities can be placed on an 'autotelic continuum' (Csikszentmihalyi, 1975 p21). Autotelic activities are more conducive to flow as they are inherently enjoyable and designed to make the achieving of optimal experiences easier, such as having clearly defined rules that require the learning of skills, clear goals and avenues for feedback (Csikszentmihalyi, 1990). It should also be noted that the experience of 'enjoyment' is distinguished from 'pleasure'. Whereas pleasure is experienced when a biological or social expectation is met, enjoyment is a deeper experience that goes beyond these expectations, usually accompanied by a feeling of achievement. According to Csikszentmihalyi, enjoyment can only come about through the investment of some effort or psychic energy and results in psychological growth (Csikszentmihalyi, 1990).

2.5.2 Nuances in flow experiences

While Csikszentmihalyi in his writings had delineated in detail the nature of the flow experience viz its nine dimensions, questions remained about the actual process of flow or exactly how and when flow took place (Wright, Sadlo, & Stew, 2006). Emerson (1998 p42) had noted that there were "…very few critiques of flow in the literature", seeming to imply that while researchers had been eager to embrace flow for its uplifting characteristics and conduct research based on its defined nine dimensions, few had sought to question the exact nature of its construct and the process behind the flow experience. For example, would it 'diminish' the flow

experience if a person had a deep experience involving some dimensions but not others? What if some dimensions were more prevalent than others, in which case would these still be considered as flow experiences (Kimiecik & Stein, 1992)? In other words, were there degrees or nuances of flow experiences and if so, how did we distinguish them (Emerson, 1998)?

Csikszentmihalyi had alluded to such nuances when he sought to explain flow as a continuum of experiences, ranging from everyday perfunctory 'microflow' events that took place daily that the person may not even be aware of, to deeper and more engaging 'macroflow' or deep flow experiences that may only be experienced a few times in a lifetime, if at all (Csikszentmihalyi, 1975, 1992). However, he had been personally been reluctant to define the process of flow to any degree of clarity or attempt its measurement, content (if not always happy) to leave others to do so (see e.g. Jackson & Marsh, 1996), while choosing to concentrate mostly on its phenomenological aspects (see in general Csikszentmihalyi, 1992). While he had admitted (with what felt to me like some degree of self-interest) to some lingering doubt that defining flow more precisely and thereby subjecting it to rigorous testing might disprove or discredit it, he nevertheless stated his position that any attempt to crystallise the exact nature of flow precisely missed the point that it was a highly subjective and personal experience:

> *"The important thing, in my opinion, is not to **reify** flow. The moment we say that 'flow is the balance of challenges and skills' or that 'flow is a score of 'x' on the Flow Questionnaire,' we have lost it. We have mistaken the reflection for the reality. The concept of flow describes a complex psychological state that has important consequences for human life. Any measure of flow we create will only be a partial reflection of this reality." (Csikszentmihalyi, 1992 p183, emphasis in original)*

Csikszentmihalyi's more recent pronouncement that deep concentration may be the "origin" of the other four experience dimensions of flow (Beard, 2015 p358) raised further questions about the relationship of the nine dimensions when flow took place. Ironically, one of the reasons he appeared to proffer for saying this was to facilitate ease of measurement. This ambiguity encouraged researchers to try to better understand the how complex flow phenomenon operated (see e.g. Emerson, 1998; Kimiecik & Stein, 1992; Wright et al., 2006; Wright, Sadlo, & Stew, 2007).

These uncertainties prompted Quinn (2005) to question the widely-held view of flow being the result of the presence of its nine dimensions, saying that this meant flow was a second-order rather than first-order factor, i.e., flow was the outcome of its dimensions rather than an outcome in itself. Citing Csikszentmihalyi (1975 p38)

who had said that the dimension of action-awareness was the clearest sign of flow, Quinn went further and argued that in essence, the flow experience **was** action-awareness merging, or the merging of awareness and application as he called it. He postulated that the key to the flow experience was the automaticity of the actions of the person performing the activity, the ability to make quick decisions on what to do when faced with different challenges. Examining the characteristics of the other eight dimensions, he then built a model of flow (action-awareness merging) as a first-order factor and the other dimensions as being factors influencing the flow experience. In Quinn's model, it was thus critical from the outset to establish the challenge-skill balance and clear goals of the task, while concentration and feedback received during the activity also contributed to the flow experience. The remaining four dimensions were second-order factors that were experienced as a result of flow. While Quinn's study was in the context of knowledge application, his flow model illustrated possible relationships between flow and its dimensions and, more importantly, suggested the possibility of flow without the presence of all nine dimensions. According to Quinn, this could account for instances when experiences were strongly flow-like in which not all nine dimensions were present.

Another attempt to examine the nuances in the flow experience vis-à-vis its nine dimensions was made by Wright et al. (2007). The researchers sought to investigate the nature of flow by examining the experiences of seven people in five different 'occupations' who were thought to have experienced flow in the sense that they engaged in those activities for the sheer sake of doing it on a daily basis. The researchers discerned four states of flow-like experiences that, while having similarities, nonetheless had key differences in terms of how the participants experienced flow which they named 'challenge-skills', 'enjoyment', 'positive distraction' and 'mindfulness'. 'Challenge-skills' was the state that was closest to flow as conceived by Csikszentmihalyi, in terms of how the participants overcame challenges by applying their occupational skills and operated at optimal levels of performance. While the state of 'enjoyment' was also predicated by the participants having to overcome challenges and being absorbed in the activity, there was comparatively less anxiety in the experience. 'Positive distraction' took place when the activities were less challenging and engrossed the participants only to the extent that they were taken away from their everyday worries. When the participants were in a state of 'mindfulness' the dominant experience was one of relaxation while still being focused to the extent of maintaining a 'moment-to-moment' awareness of their

surroundings. This research was instructive in that it explored differing levels of flow and suggested that the extent of the presence or absence of its dimensions could define the nuances of flow.

The studies by Quinn and Wright et al. are important in their attempts to examine and better understand the nature of flow through the interplay of the nine dimensions. This study takes cognisance of their conclusions that flow could be present even when its nine dimensions are not clearly so.

2.5.3 State of flow research

Over 40 years after its inception, flow theory has been widely researched and applied in diverse fields (see Csikszentmihalyi, 2009 for more examples), such as computer-based learning and online experiences (Shin, 2006), sports (Jackson & Marsh, 1996), occupational therapy (Wright et al., 2006, 2007), work environment (Bakkar, 2005), early childhood education (Custodero, 1998, 1999, 2005), knowledge work (Quinn, 2005), theatre (Martin & Cutler, 2002) as well as music (Diaz, 2013; O'Neill, 1999), to give but a few examples. Attempts to better understand the flow phenomenon have resulted in the design of quantitative instruments to 'measure' the person's mental state during flow experiences in a more expedient manner than the prevalent ESM and qualitative methods used by Csikszentmihalyi himself (see e.g. Jackson & Marsh, 1996; Shin, 2006). The proliferation of such an extensive body of research lent credence to the validity and value of flow as a construct for understanding the positive human condition. While the precise nature and process of flow has remained nebulous, as a concept it has stood the test of time and been applied in a diverse range of fields and disciplines, in the process helping to give birth to a distinct branch of psychology known as 'positive psychology', which studies the attainment of human flourishing (Jackson, 2012).

Given flow theory's robustness as a concept and its affinity with enjoyment and intrinsic motivation, it therefore seemed to me a worthwhile endeavour to better understand flow in the Singaporean music classroom as a precursor to how it could be leveraged on to cultivate in students a more positive lifelong disposition towards music and music learning.

2.6 FLOW AND MUSIC

This section of the literature review examines the possible synergy between flow and music and how that relationship can potentially be harnessed in music education in order to enhance student motivation to learn music.

Csikszentmihalyi had consistently advocated strongly in favour of arts, especially aesthetic, education for the role it played in bringing about happiness, which he called "…the highest goal of human life", something which "…cannot be achieved through material means such as wealth, a good job, creature comforts, or even physical health" (Csikszentmihalyi, 1997 p36). He noted that his research had shown that "…a person will report significantly higher levels of happiness, self-esteem, and other positive responses when actively engaged in art or music, as compared with other activities" (Csikszentmihalyi, 1997 p36). He therefore argued that aesthetic education was as important as cognitive education as follows:

> *"Reasoning and knowing are held in high esteem because they are indispensable tools for survival. Nevertheless, they are only tools. Aesthetic experiences, on the other hand, are valued in their own right because they enhance the quality of life directly. While cognitive processes can also be enjoyed for their own sake, this only happens when reasoning is used in a playful mode, as in scholarship or problem-solving – that is, when thinking becomes an aesthetic experience." (Csikszentmihalyi, 1997 p37)*

Csikszentmihalyi believed that musical engagement was rich in potential for flow experiences (Csikszentmihalyi, 1975, 1990; Csikszentmihalyi & Schiefele, 1992). Noting that the manipulation of sound (music) for positive and social purposes was paradigmatic of almost every known culture, music, he argued, was able to "…organise the mind that attends to it, and therefore reduces psychic entropy, or the disorder we experience when random information interferes with goals." (Csikszentmihalyi, 1990 p109) As an example, he explained that when we listen to music at a certain level of attention, we notice things such as the structure, the instrumentation etc. of the music, sometimes even comparing its quality with other performances. In doing so, our mind becomes more analytic music-wise, hence 'ordering' the mind so that we are able to experience flow more often as we can better enjoy the music. When we make music, the experience goes one step further: making music in addition to listening to it makes the activity even more complex, challenging and enjoyable (and hence flow-rich). Hence actively engaging in music helps enhance the complexity of the mind, which to Csikszentmihalyi is key to self-growth (Csikszentmihalyi, 1990).

2.6.1 Praxial philosophy of music and flow

Csikszentmihalyi's two key ideas set out above on the potential of flow as a means of enhancing the human experience and music-making as a flow-rich activity were subsequently taken up and further developed firstly by David Elliott, and later in conjunction with Marissa Silverman, in the music context (Elliott, 1991, 1995; Elliott & Silverman, 2015) to challenge the prevailing approach of music education as aesthetic education (MEAE). In essence, MEAE advocated the idea of music as an object or a body of (master) works to be listened to and passively appreciated as aesthetic experiences. MEAE therefore focused on the imparting of aesthetic principles so that students could apply these as a framework to appreciate and critique the 'beauty' of both existing and new musical works or performances and have aesthetic experiences in the process (Reimer, 1970). The experiences themselves ultimately provided an insight into the world of feelings, which MEAE proponents put forward as the raison d'être of music education (Reimer, 2003).

MEAE as a philosophy was emphatically rejected by Elliott in his various writings, arguing that merely treating music as an aesthetic object to be appreciated was severely flawed, culturally (western) biased and failed to appreciate the true value of music (Elliott, 1991, 1995). Instead, he proposed a praxial philosophy of music education centred on the premise that music was a quintessentially human activity and hence not something to be passively consumed through mere 'disinterested' listening and appreciating as advocated by MEAE. Instead music had to be realised through an active process of making and listening to music reflectively, a process he called "musicing" (Elliott, 1995 p40). He summarised the key beliefs of his praxial philosophy as follows:

> *"By calling this a praxial philosophy I intend it to highlight the importance it places on music as a particular form of action that is purposeful and situated and therefore, revealing of one's self and one's relationship with others in a community. The term praxial emphasizes that music ought to be understood in relation to the meanings and values evidenced in actual music making and music listening in specific cultural contexts." (Elliott, 1995 p14)*

As a distinct discipline of knowledge that could be taught in the classroom, the basis of music under the praxial philosophy was its uniqueness among academic subjects taught in schools in reflecting music's true value as a human activity (Elliott, 1995 see Chapter 1).

In developing his praxial philosophy, Elliott latched onto Csikszentmihalyi's ideas of music as inherently enjoyable and conducive to flow and optimal experiences. He believed that the praxial approach to music could lead to human

flourishing because it brought about enjoyment, self-growth and self-knowledge, which he framed as the values of music-making and listening (Elliott & Silverman, 2015 p379). Enjoyment was the key end product of flow experiences and reflective of the inherent autotelic quality of music-making and listening. Csikszentmihalyi (1990) had spoken about the increased complexity of the consciousness resulting from flow (optimal) experiences, which Elliott regarded as indicative of self-growth. Flow experiences push us to seek ever greater challenges, which in the context of music is through the performance of and listening to musical works. Through this iterative process, as we seek to tackle and overcome ever more challenging musical works, we grow and realise our potential as human beings through music and as we reflect on our experiences, also gain valuable self-knowledge (see in general Elliott & Silverman, 2015, chapter 11).

Elliott and Silverman (2015) advanced the following argument strongly linking flow with music:

> *"…**music making and music listening are unique and major ways of bringing order to consciousness, and therefore unique and major ways of achieving self-growth and self-knowledge, or constructive knowledge**. Stated in terms of affect: dynamic musical practices provide the conditions necessary to attain optimal experience, 'flow', or happiness." (p370-371, emphases in original)*

While Csikszentmihalyi had stated that there are activities other than music that have an affinity to flow, Elliott believed that praxial musical engagements were unique in their capacity to foster self-growth as compared to, say rock climbing or chess. As Alperson (1991) explains, in the praxial approach:

> *"…The attempt is made rather to understand art **in terms of the variety of meaning and values evidenced in actual practice in particular cultures**… The truths and values of art seen rather to be rooted in the context of human practices, which… are forms of human activity that are defined (in part) precisely in terms of the specific skills, knowledge, and standards of evaluation appropriate to the practice… The basic aim of a praxial philosophy of music is to understand, from a philosophical point of view, **just what music has meant to people**..." (p233-234, emphases added)*

Music as a praxis is therefore perceived by Elliott as inherently valuable due to its being representative of the values, ethics, culture, function and social uniqueness of the practice from which it derives, something which Elliott felt could not be achieved with other activities. It did not matter if the student was being learning music in the 'generalist' or 'specialist' contexts (North & Hargreaves, 2008) because it was all about calibrating the challenge of the music activity with the skill of the learner. As Elliott and Silverman (2015) explain:

> *"**Music making is a unique and major source of self-growth, self-knowledge (or constructive knowledge)** and flow. Even for students who are just beginning to… deploy their musical thinking-in-action, musicing in a practice-specific context provides second-by-second feedback about how well they are musicing. So, too, for proficient, competent, and expert music makers. When a person's level of musicianship matches a given musical challenge, his or her powers of consciousness are completely engaged. Consciousness and action merge to 'take us up' into the actions of musicing. Music making done well engages the whole self… **Music making is valuable and significant in itself because it propels the self to higher levels of complexity**. As a student's level of musicianship progresses upward in complexity to meet the demands of ever challenging works, all levels of consciousness are propelled upwards." (p380, emphases in original)*

For Elliott and Silverman, the objective of music education would be to enhance students' musical understanding by providing progressively challenging musical tasks in order to generate the flow experiences necessary for musical growth, and hence, self-growth (Elliott & Silverman, 2015 p384). Noting that enjoyment can only result from effort, they theorised that providing an appropriate level of challenge to an activity was the key to musical learning. When the challenge was overcome through the application of effort, the student would feel a sense of achievement of having learnt something and enjoyment was the outcome. They opined that music education should therefore be structured as a progression of calibrated musical challenges to provide a structure and context for musical learning and enjoyment.

While Elliott's ideas linking music with psychological growth via flow theory and enjoyment have been criticised (Koopman, 1998 p384), it does not diminish the potential of flow and optimal experiences to inspire greater intrinsic motivation in the learning of music, especially given flow's affinity to music. From this perspective, there is some value in gaining a deeper understanding of flow in the music context. The balance of challenge and skill is never static and a person engaged in an activity is constantly seeking greater challenge in order to avoid boredom (Csikszentmihalyi et al., 1993). In practice, when a person has overcome a certain level of musical challenge, he/she would need to look to a new level of challenge thereafter, fueling a need to upgrade his or her musical skills and so on. Flow therefore works in a positive reinforcing loop that challenges the person to continually enhance his or her musical skills and knowledge as the person looks to higher levels of challenge in order to achieve flow and growth (Custodero, 1999). In addition, this self-reinforcing process also has a positive impact on intrinsic motivation (Burak, 2014). As such, regardless of the expertise level of the learner, channeling musical experiences to achieve a state of flow can engender positive learning experiences to maintain high

levels of motivation as students gain positive reinforcement from their ability to finish adequately challenging tasks and therefore, look forward to their next musical challenge (Austin, Renwick, & McPherson, 2006; O'Neill & McPherson, 2002).

2.7 FLOW IN MUSIC EDUCATION

This section examines literature on how researchers have approached flow in music education to get a better understanding of how flow may be applied to potentially impact music education and enhance musical learning. I will firstly touch on how flow has been examined for its impact on learning.

In their research on education in schools, Shernoff and colleagues sought to examine how flow could engender greater student engagement through the key flow characteristics of concentration, enjoyment and interest (Shernoff et al., 2003). The sample involved 526 students randomly selected from 13 American schools, using the ESM to find out the kinds of learning activities the students were engaged in in a school day, and which were the ones that most fostered student engagement. They found that student engagement was most influenced by activities with two characteristics: challenge-skill balance, particularly when students were presented with tasks slightly too difficult to master, and those that fostered positive emotions, i.e. students enjoyed. They further advanced the proposition that engendering more flow in classrooms could provide part of the solution. This research showed the potential positive impact flow could have in the education context viz positive student engagement in the classroom, and the key role that teachers could play in shaping these experiences through judicious planning of appropriately challenging and enjoyable activities. In a further review of different student learning contexts, Shernoff and Csikszentmihalyi (2009) also noted that two key enablers of student engagement were academic intensity and a positive emotional response (p143). Viewed through the lenses of flow, this meant cultivating a stimulating and enjoyable learning environment through the provision of sufficiently challenging activities.

While Shernoff and colleagues were concerned with flow in the general education context, there were also music educators who recognised the potential of flow in enhancing music learning and called for its application in music education (see e.g. Byrne & Sheridan, 2000; Csikszentmihalyi & Schiefele, 1992; Custodero, 2002; Sinnamon, Moran, & O'Connell, 2012).

2.7.1 THE CONDITIONS OF FLOW

From the preceding section reviewing literature on flow and music, flow, with its affinity to music and enjoyment, would appear to be a potentially useful concept to apply in the music classroom to bring out enjoyment, and in doing so, positively influence student's musical learning experiences and cultivate motivation in the process.

Csikszentmihalyi, in his many studies on flow, did not specify a hierarchy of importance vis-à-vis the nine dimensions, though he did consider loss of self-consciousness as the defining dimension of the flow experience dimension cluster, as already mentioned. Nor did he state clearly exactly how flow came about (Csikszentmihalyi, 1992). While he did admit that flow could occur "…by chance… it is much more likely that flow will result either from a structured activity, or from an individual's ability to make flow occur, or both (Csikszentmihalyi, 1990 p71)." He also said that the key to the engendering of flow experiences was the presence of a challenge which had to be met by a certain set of skills (Csikszentmihalyi, 1978). This suggests that flow experiences may to some extent be 'engineered' or at least facilitated at the first instance by structuring an activity at an appropriate level of challenge to the participant(s) (Csikszentmihalyi & Schiefele, 1992). If effectively applied in the classroom, flow could engender greater engagement and intrinsic motivation for students to want to learn more about music or musical activities. If carried out effectively, school music classes could provide a platform for students' self-knowledge, self-growth and enjoyment as envisioned by Elliott.

In their tracing of the evolution of the music curriculum in Scotland since the introduction of rock music into the syllabus Byrne and Sheridan (2000), advocated for the direct application of flow in the design of music lessons by music teachers. While they acknowledged that classically trained music teachers may neither be familiar nor comfortable with using rock music in the classroom, they argued that in order to create an authentic environment for musical growth it was incumbent on teachers to be "…open to all types of music and should not feel inhibited in encouraging students to explore different forms of music and, in a spirit of partnership, even those which they are unfamiliar or with which they feel uncomfortable…" (p51). The authors went on to encourage teachers to create an environment conducive for flow by ensuring appropriate challenge-skill balance for musical activities and facilitating a supportive, happy and friendly classroom setting. Finally, they urged teachers to:

> *"…use the 'flow' model as a reflective tool in order to initiate and plan innovative and exciting learning opportunities, to monitor, regulate and assess learning and to ensure that tasks are achievable and have clear goals within an environment where collaboration, peer learning and development of the person as well as the musician is valued." (p54)*

The question is how flow can be brought about in the environment of the everyday music classroom.

As already discussed in the earlier section on *Flow*, the dimensions of challenge-skill balance, clear goals and unambiguous feedback are considered as flow precedents (Csikszentmihalyi, 2009; Nakamura & Csikszentmihalyi, 2002). This suggests that certain prerequisites may need to be present for flow to take place. The nature of the dimensions cited suggest that flow experiences can be facilitated either by providing a suitable environment or through third party inputs, which in the education context would very likely come from the teacher, peers taking part in the same activity or in some cases, a parent. This view is reinforced by Csikszentmihalyi (1978), noting that in order for an activity to be intrinsically rewarding, it had to take place in a meaningful context in which a third party's "…concern for the performance of the activity will lend reality to its challenges" (p213). Diaz (2013 p43), summarising the findings of various research studies on flow, also concluded that music was most conducive to flow when the challenge of the musical task was matched by the skills of the participants, had clear goals and provided opportunity for feedback on progress.

2.7.1.1 Flow conditions and music education

In the music education context, based on her extensive research on flow in young children, noted flow researcher Lori Custodero has consistently observed flow in young pre-school children when they are engaged in musical activities and used her findings to advocate strongly for the application of flow as a pedagogical tool in the music classroom (Custodero, 1998, 1999, 2002, 2005). She opined that "…the dynamism created by challenging, intrinsically rewarding activity and requisite skill suggests that the identification of flow in learning environments should inform pedagogical practices. (Custodero, 2002 p5)"

Starting from the premise that young children are in a constant state of flow, she sought to understand how they experienced flow in the context of making music. Realising that the self-reporting ESM most commonly used in flow research may not be feasibly administered to very young children (Custodero, 2005), Custodero

developed an observation tool for use in her studies called the Flow Indicators in Musical Activities (FIMA), which sought to adapt the investigative properties of the ESM in the naturalistic setting of young children's music classes (Custodero, 1998). Using the FIMA in a series of recorded observations, she concluded that flow was closely linked with children's cognitive development, noting that they reacted dynamically to inputs from adults and stimuli from their peers as well as things that were happening around them during the music class in order to maintain a state of flow (Custodero, 1999). She then expanded her study, observing four different age groups of children (7-23 months, 25-34 months, 5-6 years, 6-8 years) engaged in age-appropriate musical activities or lessons and mapped their actions to the different dimensions of flow, comparing how the efforts of the children in the different age groups attempted to remain in flow differed (Custodero, 2005). She observed a "waning of flow" (p203) as the activities became more formal or 'academic' in nature, which she attributed to a diminished autonomy of the learner or participant in the overall flow experience and an increased desire to conform to the teacher's norms in a more structured classroom context. In this regard, it would appear ironic that while some structure is desirable in order to help bring about flow, too much structure would inhibit flow experiences.

While Custodero's research was confined to very young children, the utility of her findings should not be underestimated in terms of enhancing our understanding of the human dynamics and its impact on flow experiences. In particular, her detailed observations on the interactions of the learner with peers and adults may provide valuable insights on the potential application of flow in music education:

> *"…this study suggests new directions for music education practice involving the fundamental importance of perceived challenge as an antecedent to skill development, and the more specific applications of the flow indicators and their developmental implications. In seeking flow, both learners and teachers operate in a state of inquiry. Learners ask questions about how a given activity can be made more complex; teachers, in response to thoughtful observation, assess the pedagogical milieu and adjust their delivery and feedback to be responsive to demonstrations of the learner's engagement with the musical task." (Custodero, 2005 p205)*

The preceding words provide a timely reminder that while flow is often perceived as a highly personal and even individualistic experience, in the music education context, flow does not take place in a vacuum and is often the outcome of dynamic human interaction and deliberate action.

In summary, there is support from extant literature that while flow can be a spontaneous occurrence when the participant is engrossed in the activity, it can also

be brought about through the efforts of the participant or facilitated by interested third parties. In this regard, Custodero (2002) provides useful guidance, outlining an approach under which flow can be used in the music classroom to enhance learning and cognitive development through: (a) adult (teacher) inputs to provide the appropriate level of challenge to the activities; (b) allowing for student input and autonomy in the learning process; and (c) engaging the learner guided by an authentic pedagogy and authentic musical activities (p6-8).

2.7.2 How flow enhances musical learning

I have tried to show in the preceding section on '*Flow and Music'* how Elliott and Silverman have argued for the adoption of flow in the music education context via the praxial approach in order to achieve the lofty human goals of self-growth, self-knowledge and enjoyment (Elliott, 1995; Elliott & Silverman, 2015). At the more practical level, it needs to be examined how the incorporation of flow into music learning helps in the attainment of educational goals.

A number of research studies have found flow to be a strong indicator of a student's motivation to continue being engaged in their chosen activity. In their seminal longitudinal study over four years, Csikszentmihalyi et al. (1993) examined the daily lives of 208 grade 9 and 10 students nominated by their teachers as being talented in music, art, math and science to determine if and when they experienced flow and the nature of those experiences. They found that the art and music students experienced flow more regularly than the math and science students due to the autotelic nature of the arts, and likewise the art and music students also showed greater intrinsic motivation. The researchers even found that the students inclined to math and science in general also experienced more and flow and demonstrated higher motivation in art and music classes than in math and science classes. This finding again demonstrates the affinity between flow and the arts and flow's accessibility through music, reaching even those not considered to have any particular disposition towards music.

A study by O'Neill (1999) sought to follow up on what she perceived as a deficiency in the Csikszentmihalyi et al. (1993) study vis-à-vis music by examining if flow had an actual positive impact on students' motivation to practise and their musical achievement. Her research participants were 40 students attending a selective specialist music school and 20 students from a non-specialist state school in the UK. The 40 specialist students were further divided into a group with 20

‘moderate’ and 20 ‘high’ achievers while the 20 from the state school were selected based on their high level of involvement in musical activities in the school. Adapting the ESM, she measured the amount of time the students spent in flow playing music and also in other activities over a one-week period and compared them. She found that the students in the ‘moderate’ group spent less time in flow compared to the ‘high’ group and the state school group, which would appear to show that the presence of flow did have a positive impact on musical performance[3].

In a similar vein, Garces-Bacsal, Cohen, and Tan (2011) conducted a qualitative study of the flow experiences of 14 artistically talented students at Singapore’s only specialised arts (high) school. They found that flow permeated the artistic lives of the students, mapping out eight of the nine flow dimensions in their experiences, less action-awareness merging. Such was the students’ engagement in their art that many of them saw it as a necessity in their lives and some were indeed prepared to defy their parents should they be prohibited from continuing to pursue them (p203-204). This would appear to corroborate the conclusion of Csikszentmihalyi et al. (1993) and O'Neill (1999) that the presence of flow experiences had a direct influence on the student’s engagement with and achievement in their art form.

In a more recent study by Miksza and Tan (2015) the researchers studied the teaching and practice strategies and approaches of 52 studio lesson teachers and 241 of their students in 25 large collegiate music programmes in the US to determine if they correlated with, inter alia, flow. The researchers found that flow was strongly related to ‘grit’, or a quality reflecting “…perseverance and passion for long-term goals”, further noting that “…An individual who is ‘gritty’ not only completes short-term tasks but also works toward long-term outcomes (Miksza & Tan, 2015 p164).” They concluded that as “…gritty individuals are likely to practise more… they may improve their skills, which in turn leads to flow as their level of skill matches the challenge of the task (p174).” Hence the more frequent the flow experiences, the greater, it would appear, the motivation of the student and his or her willingness to pursue long-term music goals and outcomes. This may in turn have an impact on other motivational factors such as self-concept.

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3. It was not apparent in the article, but it appeared that O’Neill treated the ‘state school’ group as being on par with the ‘high’ group as having high musical achievement albeit in the context of a non-specialist music school. While the ‘state school’ group did report spending more time in flow than the ‘moderate’ group, they spent less time practising, a fact that was not accounted for. The large amount of time the ‘moderate’ group spent practising, which was about the same as that for the ‘high’ group, perhaps reflected the necessity of practice in a specialist school.

Flow has also been found to have a positive impact on creativity. Byrne, MacDonald, and Carlton (2003) attempted to include flow as an intrinsic aspect of an assessment tool for creativity to study if the presence of flow had a direct impact on the level of creativity in a composition assignment for music students at a Scottish university. In their study, the researchers attempted to embed flow in the assessment process by (a) setting the tasks in such a way as to ensure that the flow domains of skill-challenge balance, clear goals and unambiguous feedback were present and (b) requiring the students to report on these three-dimension mini 'flow states' after their meetings. They found that the presence of flow had a direct correlation with the levels of creativity and concluded as follows:

> *"We can envisage a teaching and learning tool that makes use of the flow model in which the learner is kept on-task, regular and immediate feedback is given, clear targets are well defined and achievable, and in which there is a balance between challenges and skills. Of course activities in which participants can attain feelings of flow are likely to be highly intrinsically rewarding in themselves… The attainment of high levels of flow would be a strong indicator of the progress by the learner and of good-quality attainment in creative music-making." (p287)*

This research study demonstrates it is feasible for the flow model to be adapted in some form in the music education context. It also underlines the importance of the teacher in facilitating flow by focusing on the dimensions of challenge-skill balance, clear goals and unambiguous feedback.

In summary, the research showed that flow in the music learning context had a positive impact on student engagement and achievement. Though encouraging, it should be noted that the studies cited above largely focused on students who have at least an above-average level of interest and/or ability in music (specialist context). Their abundance of flow experiences should therefore not come as a surprise given that the central flow idea of optimal performance can be most easily realised at high performance or achievement levels. The key question is whether these flow experiences are also found in students who have no particular stake in music learning (hereinafter referred to as 'generalist students'), i.e. they neither have music lessons outside of school nor take part in additional musical activities in school other than the prescribed classroom music lessons.

2.7.3 ROLE OF THE TEACHER

From the literature, there is strong support for the notion that the music teacher plays a key role in the motivation levels of students in music education (Bloom, 1985; Garces-Bacsal et al., 2011; Ho & Chong, 2010; Rusinek, 2008; Sloboda & Davidson, 1996). But as O'Neill (1999) put it:

> *"Although there is little doubt that motivation to persist in instrumental learning is inextricably linked to the educational, social and cultural environment, there must be a limit beyond which no amount of support and encouragement can make a child without any **intrinsic** interest in music engage in the amount of effort required to achieve even modest levels of musical competence." (p129-130, emphasis in original)*

For musically engaged or talented students, the intrinsic interest and motivation to constantly seek challenges (that then lead to flow experiences) may already reside in themselves (Csikszentmihalyi et al., 1993); for the regular student, such latent interest may need to be cultivated. The role of the music teacher in facilitating flow would firstly be to set an activity at the appropriate level of challenge for the students, setting clear goals to be achieved and then providing clear feedback to the students during the activity. As Custodero (1998) noted, in the music education context, while children are the agents of their own learning, "…the quality of adult [teacher] intervention plays an important role in the children's quality of experience and flow" (p26).

The importance of the role played by the teacher in bringing out flow in the teaching of music was demonstrated in a research study by Bakkar (2005) involving 178 music teachers and 605 students from 16 music schools in the Netherlands. Examining flow from the perspective of the teacher rather than the student, the researcher wanted to find out if improved teacher well-being and support in terms of better guidance, resources and feedback had a positive impact on their flow experiences, and whether that in turn had a crossover effect on the students' own flow experiences in a process called 'emotional contagion'. Framing his hypothesis in the affirmative, he surmised as follows:

> *"…During the teaching, several ongoing interactive (verbal as well as non-verbal) processes take place between the teacher and his or her students. In addition to seeing each other and talking to each other, the teacher plays an important role in designing the lessons. The mood of the teacher thus influences many factors to which students are exposed during the lesson, and in this way, the processes of emotional contagion may take effect. In addition, the flow experience of a teacher not only includes a component of work enjoyment, which may influence the student, it also contains the components of intrinsic work motivation and absorption. This may determine the quality of the lesson and, indirectly, the enjoyment of the student." (p29-30)*

He found that the frequency of the music teachers' flow experiences indeed had a direct correlation with that of the students. This could be due to the teacher's direct manifestations of flow, such as a more positive attitude in and openly showing his or her enjoyment of the music teaching rubbing off on the students, as well as additional effort put in during lesson preparation to include music and activities attractive to the students.

In the study by Garces-Bacsal et al. (2011) concerned with the lives of artistically-talented children, it was found that many of them not only credited their teachers as being inspiring role models, but even attributed their flow experiences to their teachers:

> *"…[the teachers] have served as an inspiration to them, being artist-practitioners themselves. Mentorship is highly evident not just through the transfer of technical knowledge but the emphasis on reflective thinking and thinking for one's self, the creative process (not the product), the individualized approach to providing feedback to the student's progress, as well as providing constant encouragement and support in instances when they encounter enormous difficulties in their arts forms." (p204)*

The studies cited thus far have all been conducted in the context of students involved in some level of high-performance music studies. A qualitative research study by Rusinek (2008) focusing on a music class in a high school in Spain comprising a group of students considered by the school as delinquents illustrated the potentially decisive role of the teacher in facilitating flow in a school music classroom setting for regular students. The researcher interviewed the teachers (including the class' non-music teachers), administrators and the students, and also observed their music classes and performances. The music teacher had adopted Elliott's approach (Elliott, 1995) of authentic music making (musicing) as a means and end of the classes, transforming the music classes into a series of rehearsals that culminated in a school performance. He actively involved students both in the creative process for the musical preparation of the concert, as well as the management process of preparing and planning for the performance, giving them greater ownership of the project (autonomy). Following the ideas of Green (2002) on informal learning, the use of popular music and empowering students, he made arrangements of music favoured by the students while also seeking their inputs on the concert repertoire. In the process, he managed to transform the attitudes of the students, increase (intrinsic) motivation, enable them to become agents of their own learning and enhance self-efficacy and self-regulation. Though Rusinek did not expressly use flow theory to frame his study, it was evident from the teacher's

adoption of Elliott's approach and ideas (with their connection to flow) and the observations and anecdotes Rusinek cited that flow experiences were very much a part of the outcome. Mapped to the flow dimensions, there was 'concentration' (Rusinek, 2008 p18), 'enjoyment' (autotelic experience) in the music making process (p16), 'feedback' (p17), 'challenge-skill balance' (p18-19), sense of control in the extent of student involvement in the concert preparation and repertoire selection, and a 'clear goal' (p14) which was the concert. To Rusinek, the teacher had played an important role in the transformation of the students' attitudes, providing the necessary conditions and motivation for them to thrive, completing their conversion from a disinterested group into music enthusiasts and confounding his colleagues who had believed that the class was unteachable.

From the studies cited above, the role of teachers in bringing about flow in the music classroom can be summarised in the following ways: serving as a role model, creating the necessary conditions to facilitate flow through lesson planning and adopting appropriate pedagogies, and giving the students a measure of autonomy in the learning process. They also affirmed the findings of Shernoff et al. (2003) in the potential of flow in engendering greater student engagement in the music classroom.

2.7.4 RESEARCH ON THE FLOW STATE IN MUSIC EDUCATION

While much of the research on flow in music education has focused on the context of musical activities or learning processes, two studies by Sinnamon et al. (2012) and Wrigley and Emmerson (2013) have focused on understanding the flow state in the performance context, or the quality of the flow experience.

In the first research study by Sinnamon et al. (2012), their objective was to find out if the flow experiences of students pursuing an 'amateur' level of music study (i.e. not majoring in music but taking lessons) were different from those of students studying at a 'professional' level at a conservatory (i.e. full time music students seeking a career in music). A total of 205 students took part in their study, of which 125 were 'amateurs' and 80 'professionals'. The researchers found that while the frequency of flow experienced by the 'amateurs' and 'professionals' did not vary significantly, their respective experiences vis-à-vis the nine flow dimensions were different. The dimensions of challenge-skill balance and clear goals for the amateurs were less significant compared to professionals, but their experience of loss of self-consciousness was (somewhat surprisingly) more pronounced. Nevertheless, the

researchers concluded that flow was important for both amateur and professional music students:

> *"Although there are important differences between the amateurs and elite musicians the fact that large majorities in both groups had experienced flow in musical settings means that educators could potentially begin thinking about supporting and looking for flow experiences even in those who are in the early stages of their learning experiences in music. Given that flow is an unambiguously positive experience, then a case could be made that promoting its frequency for the novice musician is especially important since it is likely to encourage the individual to persist in learning, at a stage when his or her performance will lack the necessary polish to elicit positive feedback from audiences." (p21)*

While the researchers acknowledged that the general weakness of flow research lay in the fact that flow can (at least currently) only be measured after its occurrence, they encouraged music educators to consider harnessing its potential, for "…at least knowing that the phenomenon of flow exists and is beneficial to performance could be a useful asset to the educator (p21)."

As most research studies on flow in music education have tended to focus on musicians operating at high levels of performance, the findings of this study are significant as it provides clear empirical evidence that flow is also equally experienced by students who are not pursuing music at a high level. This affirms Csikszentmihalyi's assertion that flow can take place at any level of difficulty provided that there is challenge-skill balance (Csikszentmihalyi, 1975).

The subjects of the Wrigley and Emmerson (2013) study were 236 music students majoring in five different instrumental families at an Australian tertiary institution, whose flow states were measured immediately at the end of their mid- or end of year music assessments based on the nine flow dimensions. The analysis confirmed that the flow model was valid and reliable in the context of a musical performance and consistent with research on the flow state in other performance domains, such as sports. Confirmatory factor analysis also found that all the nine dimensions predicted the flow state, with the dimensions of sense of control, autotelic experience and challenge-skill balance accounting for the most variance, and transformation of time the least. In terms of the actual flow experiences of the students, only the dimension of clear goals featured highly (4.12 on a 5-point Likert scale), with challenge-skill balance (3.61), concentration (3.53) and autotelic experience (3.51) also featuring moderately highly, while loss of self-consciousness was the lowest among the domains (3.12). The comparatively lower score for autotelic experience, the key end product of flow, was explained by the fact that the

measurements were taken in a highly stressful exam context, perhaps reducing the level of enjoyment of the students more than usual and inhibiting them from getting absorbed in their performance. The findings also did not indicate any differences in scores based on gender. The researchers concluded as follows:

> *"…while the flow state cannot be taught or made to happen, improving the pre-conditions for flow can increase its likelihood… it may be that the inclusion of teaching and learning methods in the curriculum that enhance the antecedents of flow in music performance… can increase the likelihood of students experiencing improved states of flow." (p303)*

While the research study focused on the flow state in performance, its conclusion stressing the importance of the flow precedents in engendering flow experiences is consistent with the findings of other research studies. The variance of the flow scores among the nine dimensions suggested that in the music flow experience some dimensions may be more salient than others.

The two preceding flow state studies cited are informative as they provide some insight into the quality of the flow experience during music-making. The study by Sinnamon et al. (2012) is particularly useful as it showed that there is no significant difference in the frequency of the flow experiences between expert and amateur musicians, affirming the view of Csikszentmihalyi (1975) that flow can be experienced meaningfully at differing levels of expertise in the music context. It also showed that while both groups of musicians encountered flow, the nature or nuances of their experiences differed, which suggests the possibility that there may be no consistency of flow experience even among people doing the same activity. That being the case, there is therefore a case for an investigation into the nature of flow experienced by students in the music classroom, especially given that flow studies so far have largely not covered this particular group of learners.

2.8 CONCLUSION

From the preceding review of the current literature on flow and music, the following conclusions can be made:

(a) While flow is defined by its nine dimensions, it would appear that flow or flow-like experiences can still take place even if all nine are not present or are manifested evenly during the experience;

(b) Music is an activity that is conducive to engendering flow;

(c) Musical learning can be planned and structured to facilitate flow;

(d) Flow can complement musical learning and, in the process, cultivate longer term motivation and interest in music; and

(e) In an ideal state, musical learning can be a key enabler of human flourishing.

It is my opinion that more research needs to be done to better understand the students' flow experiences in terms of the dynamics of the flow dimensions. As there is currently a paucity of research on flow in the generalist context, there is a greater urgency for research in this domain of learners to understand if and how generalist students experience flow. With a better understanding of how flow is experienced in the school music classroom, I am in full agreement with Sinnamon et al. (2012) there is the compelling possibility that music educators can harness flow to improve the quality of musical learning and cultivate a long-term interest in musical engagement among students.

2.9 RESEARCH QUESTIONS

Based on the background information set out in the Introduction regarding my motivations for conducting this research study and the understandings of flow gleaned from the Literature Review, the following are the research questions for this study:

(1) Do primary five and secondary one students in Singapore experience flow or some iteration of flow during their regular school music classes?

(2) If so, what is the nature of their flow experiences?

(3) Do the flow experiences of primary five and secondary one students differ, and if so how?

(4) Do the flow experiences differ between students with and without some additional musical learning experiences either within or outside the school context?

(5) How do the music teachers impact the students' flow experiences?

CHAPTER 3 – METHODOLOGY

3.1 INTRODUCTION

This chapter sets out the epistemology behind the different research approaches and sets out the basis for my choice of the specific methods used in the research project while taking cognisance of and critiquing the different approaches to flow research in music education adopted by other music researchers. I detail how the quantitative instrument key to the research was designed, developed and trialled in a pilot study to establish its reliability and make any necessary changes to its items. This is followed by the elaboration of the design processes for the development of the qualitative methods of data collection, namely the focus group schedules and frames for video observations. I then delineate the different approaches to analysis adopted for the focus groups and video observations and outline the rationale behind their selection. Finally, I deal with the ethical issues behind the study and the steps I took to ensure that the standards of research ethics were adhered to.

3.2 EPISTEMOLOGY

The realm of social (and educational) research is and has long been dominated by the conflict between the positivist and constructivist paradigms. Citing the belief that the key tenets of one were diametrically opposed to the other, purists of both had regarded the two as incompatible, i.e. research conducted could only utilise either approach to the exclusion of the other (see in general Tashakkori & Teddlie, 1998, chapter 2). This uncompromising position has long divided researchers into one camp or the other (Johnson & Onwuegbuzie, 2004).

3.2.1 POSITIVISM

The positivist philosophy can be succinctly stated as follows (Pecca, 2000):

> *"The positivistic paradigm is characterized by the view of reality that is independent of the knower. The ontological position can be traced historically to Aristotle's conception of reality as independent of a person's volition. An objective reality does exist and is knowable. The reality is outside of a person and an individual can at the same time be the knower and known. A person is the knower because the reality exists regardless of the person's desires and he is known as the object of knowledge by another person." (p3)*

It is thus often considered as being 'scientific' and objective, echoing the traditional idea in the sciences that the truth is already 'out there' and simply awaiting discovery by the researcher (Creswell, 2009; Feilzer, 2010). The researcher applied (usually)

mathematical methods using specially designed instruments, collecting and analysing quantitative data that resulted in ostensibly objective and bias-free conclusions that were intended to affirm what was thought to already be in existence. The aim was to reduce the possibility of the researcher having any subjective input that may impact the conclusions, thereby robbing it of its objective quality (Teddlie & Tashakkori, 2009). The modus operandi of positivist researchers was quantitative methods, utilising a wide variety of statistical tools and approaches that had been formalised over time. Data collected were reduced to numeric form and therefore tended to be detached from the research participants. The underlying purpose behind such rigour, and the purported strength of positivism, was the claim that since the findings were 'true' they were thus generalisable and could be replicated (Tashakkori & Teddlie, 1998).

Critics of positivism contended that the objective, value-free research expounded by the positivists was neither possible nor desirable. Even using the most controlled quantitative methods, some element of researcher input into the research process was unavoidable and necessary, inserting the very 'subjective' element that the positivists were so keen to avoid. The generalisability of research findings had also been questioned, that just because something had been observed to happen many times, it did not mean that it would always happen again even in the same conditions (Teddlie & Tashakkori, 2009). The reduction of findings to a measurable numerical form was criticised as an over-simplification and totally missed the point of the complexity of human experience (Cohen, Manion, & Morrison, 2011). These criticisms resulted in an evolution of positivism into what is today known as post-positivism, which while still clinging to the central tenets of positivism, looked at research as a process of falsification, rather than proof (Crotty, 1998). The result was an evolved approach in quantitative research of hypothesis testing using probability, i.e. if the same experiment was repeated several times, how often (or how certain) would the outcome be observed.

3.2.2 CONSTRUCTIVISM

In contrast, the constructivist approach emphasised subjectivity and purposefully placed the researcher at the centre of the research process. (Crotty, 1998) defined constructivism as:

> *"… epistemological considerations focusing exclusively on the 'meaning-making activity of the individual mind'… constructivism taken in this sense points to the unique experience of each of us. It suggests that each one's way*

of making sense of the world is as valid and worthy of respect as any other…" (p58)

Constructivists rejected the positivist approach of reducing everything into numeric form as simplistic; instead they embraced the premise that human experiences were complex and unique, and therefore real-world empirical research should reflect so accordingly (Creswell, 2009). They utilised qualitative methods that placed the researcher at the heart of the data collection process, such as observations, interviews and ethnography, allowing the researcher to establish a closer relationship, even interacting and having a direct impact with the research environment and participants. They also placed greater emphasis on giving the research participants a voice, often reflecting the experiences from their perspective. In the process of analysis, the researcher also lent his/her own expertise and perspective in the interpretation of the data (Teddlie & Tashakkori, 2009). There was therefore a deliberately strong element of subjectivity in the qualitative research process, not just in terms of the data collected, but also in the way it was interpreted. Constructivists believed that through this process, a richer narrative about the experiences could emerge, providing more valuable insights into human experiences, compared to the detached numerical findings preferred by positivists. While there was a greater emphasis in giving voice to subjectivity and diversity in qualitative research, it did not follow that there was a lack of rigour in its processes, and some measure of quality was needed in the researcher's approach, albeit within the constructivist sphere of validity (see e.g. Yardley, 2000).

The biggest criticism of constructivism and qualitative research was precisely its highly subjective nature: that everyone's perspective was valid and unique begged the question of what the point of research was, if the findings were not intended to be generalisable or had no reusable value. While it was acknowledged that such knowledge could be meaningful, it could not form the sole basis of social sciences research (Cohen et al., 2011). With its emphasis on subjectivity, constructivism had also been criticised as being anathema to cultivating the critical spirit needed for meaningful research (Crotty, 1998).

3.2.3 PRAGMATISM

Due to the dialectic nature of the positivism-constructivism debate, there emerged a third possible social research paradigm guided by pragmatism, defined by (Tashakkori & Teddlie, 2003) as:

> *"A deconstructive paradigm that debunks concepts such as "truth" and "reality" and focuses instead on "what works" as the truth regarding the research questions under investigation. Pragmatism rejects the either/or choices associated with the paradigm wars, advocates for the use of mixed methods in research, and acknowledges that the values of the researcher play a large role in interpretation of results." (p716)*

As stated, the research method of choice for pragmatists was mixed method research. This approach freely used both quantitative and qualitative methods since it was not bound by the researcher's philosophical allegiance to positivism or constructivism, but on what the most appropriate tools for the particular research in question were (Patton, 2002). As Johnson and Onwuegbuzie (2004) put it succinctly, "…the goal of mixed methods research is not to replace either of these approaches but rather to draw from the strengths and minimize the weaknesses of both in single research studies and across studies…" (p14-15). While its lineage was said to trace all the way back to Aristotle (Teddlie & Tashakkori, 2009), its emergence in the consciousness of mainstream research was fairly recent and evidenced by the promulgation of academic journals and textbooks dedicated to its discussion over the last 30 years or so (Teddlie & Tashakkori, 2009).

Though there are some purists in the positivist and constructivist tradition who remain skeptical, mixed method research is increasingly gaining acceptance as a distinct research paradigm on its own (Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 1998). Quantitative and qualitative methods were increasingly less seen as being in opposition or incompatible, based on their respective underlying philosophies of positivism and constructivism; rather they were considered as being on opposite ends of a continuum on which the researcher placed himself/herself as appropriate (Creswell, 2009; Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2009).

3.2.4 METHODOLOGICAL APPROACHES TO FLOW RESEARCH IN MUSIC AND MUSIC EDUCATION

Since its articulation in 1975, flow theory (Csikszentmihalyi, 1990) had become a well-established concept in applied psychology, having been researched and applied in diverse fields, such as computer-based learning (Schaik, Martin, & Vallance, 2012; Shin, 2006), assessment (Byrne et al., 2003), education (Ainley, Enger, & Kennedy, 2008), social activities (Diaz & Silveira, 2013), knowledge management (Quinn, 2005), occupational therapy (Wright et al., 2006) and sports (Jackson, 1996). In the field of music, much of the research had focused on the

domain of elite or higher-level music studies, mainly in performance but also in composing and listening (Diaz, 2013; Garces-Bacsal et al., 2011; MacDonald, Byrne, & Carlton, 2006; O'Neill, 1999; Sinnamon et al., 2012; Wrigley & Emmerson, 2013), for which the concept of optimal experience lent itself more naturally. There had been little done in the context of the music classroom in schools and its impact (or lack thereof) in motivating student interest, although Byrne and Sheridan (2000) did comment on the teaching of rock music in the context of the Scottish music classroom and how it had affected student interest in learning music by creating an environment conducive to flow. Custodero (1998, 1999, 2005) had also conducted extensive research on flow in non-elite music education, but those had focused on the early childhood stage and how very young children developed musical understanding in the context of cognitive development.

In all the studies cited above, the researchers tended to rely on a single approach to data collection and analysis, either adopting quantitative or qualitative methods. In his initial research, Csikszentmihalyi (1975) had adopted a mixed method approach, though it was predominantly qualitative. The key data had been collected through long extensive interviews with many practitioners of diverse fields of practice through which he eventually constructed the concept of flow representing shared aspects of their experiences of optimal performance. The limitations of mono method research in the positivist or constructivist traditions are well documented (Creswell, 2009; Teddlie & Tashakkori, 2009). Quantitative research was limited by the parameters set by the researcher, leading to findings that may be narrow and limited in the extent that they can be applied beyond the hypothesis being tested. On the other hand, qualitative research accorded too much primacy to the researcher, allowing him/her to potentially generate any conclusion (Rorty, 1999).

In the quantitative musical studies on flow (Diaz, 2013; O'Neill, 1999; Sinnamon et al., 2012; Wrigley & Emmerson, 2013), while the researchers were able to make interesting broad findings about flow in music, they were unable to provide details of how the participants experienced flow. For the qualitative studies (Garces-Bacsal et al., 2011; MacDonald et al., 2006), while there was rich and varied data collected from the participants on their flow experiences, the researchers were not able to provide a more comprehensive picture as they were limited by the smaller numbers of participants and as the questions were open-ended, the responses did not cover all the flow dimensions. This may also have been deliberate as the nature

and limitations of qualitative studies meant that only particular dimensions of flow could be studied.

It seemed clear that mono-method research approaches to flow were not totally satisfactory in the sense that the picture painted somehow seemed incomplete, reflecting their respective utility and limitations. Given that flow was a highly subjective experience, Jackson (2012) opined:

> *"A multimodal approach that incorporates both qualitative and quantitative methods of measurement is likely to yield the greatest gains. A diversity of methodologies will offer the greatest potential to explain the 'what' and 'how' questions posed by the unique phenomenon of the flow experience." (p133)*

In their study of flow experienced by students in a writing assignment using a mix of quantitative and qualitative approaches, Ainley et al. (2008) also concluded that due to its complexity, a mixed method approach would best bring out the different dimensions of the students' experiences.

3.2.5 METHODOLOGY

According to Creswell (2009), a researcher needs to consider the following factors when designing a piece of research: (a) the philosophical worldview proposed in the study, (b) the definition of the basic considerations of that worldview, and (c) how the worldview shaped their approach to research. Given my understanding of the pros and cons of mono-method flow research set out previously, the research design for this study was therefore guided by pragmatism. A pragmatic approach is guided by practical considerations of applying the most appropriate research design and methods to best meet the needs of the research question (Crotty, 1998; Johnson & Onwuegbuzie, 2004). In a similar vein, Patton (2002) had asked that researchers be guided by "…a paradigm of choices rather than become the handmaiden of any single and inevitably narrow disciplinary or methodological paradigm (p257)". When purposefully applied, the proponents of mixed method research argued that it combined the best of both research paradigms to produce more illuminating and meaningful results.

As a researcher, I have always considered myself a pragmatist as I have always believed that one needed to be flexible to come up with the most appropriate solution. It also reflected my upbringing in Singapore, a society dominated by a pragmatic outlook necessitated by our geographic limitations of being a small island city-state with a small population and no natural resources. As a pragmatist, I sought to construct a multi-faceted picture of flow using a mixed method approach, which

enabled very different types of data from both the positivist and constructivist traditions to be collected and synthesised. It was hoped that this multi-faceted approach to investigating flow would harness the strengths of both quantitative and qualitative research methods and allow for a broad yet nuanced understanding of the flow phenomenon in the general music classroom in Singapore as experienced by students. I was further assured by the words of Jackson (2012) cited above, based on her review of research conducted on flow.

Greene, Caracelli, and Graham (1989) set out five ways in which the multiple approaches in mixed method research could add value to a study:

- Triangulation – using different methods to corroborate research findings
- Complementarity – using the results of one method to enhance the other
- Development – using one method to inform the development of another
- Initiation – using multiple methods to uncover paradox and contradiction
- Expansion – using multiple methods to expand the inquiry

For the current research, triangulation, complementarity and initiation were the key purposes. The parallel mixed data analysis approach was adopted as this was said to be the most appropriate in mixed methods research that were more exploratory in nature involving triangulation and complementarity (Teddlie & Tashakkori, 2009). In this approach, the quantitative and qualitative data collected would firstly be analysed independently and the requisite findings made. The findings would then be examined together to form 'meta-inferences', or conclusions generated through the integration of the findings or inferences obtained from the different strands of analysis (Teddlie & Tashakkori, 2009). It was likely that such an approach could result in findings from each research strand not converging or triangulating. However, mixed methods researchers welcomed such divergences, as they allowed for researchers to question their underlying assumptions and revealed different facets of the matter being researched, which could result in a better understanding.

3.2.6 Data collection challenges in Singapore

As Singapore is a small country, its education system is highly homogeneous and centralised, overseen and administered by the Ministry of Education (MOE). Schools follow a common curriculum drawn up by MOE curriculum planners that lead to the benchmark O- and A-level examinations. Similarly, research in schools is also tightly regulated by the MOE and mainly conducted by its specialists or researchers from the National Institute of Education. As such, the principals of

schools are generally reluctant to admit researchers not officially on MOE business to conduct research as the teachers and students are kept very busy during term time and hence unplanned disruptions to the daily flow of school activities are not welcome. It was therefore a privilege that six principals gave their consent for the research to be conducted in their schools and I was anxious not to add to this general sense of apathy towards research or abuse the trust they have shown in me for two reasons. Firstly, teachers in the Singapore school system are under extraordinary pressures from the public, parents as well as the school management and their duties and responsibilities are legion. As an MOE officer, I am acutely aware, and am also constantly given reminders from the school management and indeed the MOE division overseeing research in schools, of the need to not overtax the teachers. Having been a music teacher in Singapore myself, I was also empathetic to these concerns. Secondly, I did not wish to leave any negative mental models of researchers with the schools so as not to jeopardise the potential future opportunities of other researchers. With that in mind, I therefore adopted the practice of leaving all the research arrangements to the convenience of the school and its teachers, only requesting that a certain amount of time be allocated to each research activity. While I did give suggestions on how the logistics for the research could be arranged and my preferred means of doing so, the final decision rested with the school. For example, for the quantitative data collection, I recommended either coming to the relevant classes' music lessons (or any class the school was willing to let me come to) or for the teachers to arrange for all the students with consent to come together at an arranged time at a location within the school.

On the assigned day for administering the questionnaires, there were invariably absentees, either because students were absent from school, or were involved in other school-based activities. In one case where the collection had been arranged immediately after school hours, an entire class of students failed to show up as another teacher had kept them back after dismissal to attend remedial classes, a common occurrence in Singapore schools. That teacher, while aware of the students' involvement in the research, decided at the last minute to keep them back in class, as formal school activities took precedence. The fact that the data collection took place after dismissal was also a factor explaining student absenteeism. Some students simply did not show up as they did not consider the research as a compulsory school activity and hence not important. Consistent with my earlier stated approach of not taxing the teachers and leaving the logistical arrangements to

the school, I did not request to re-administer the questionnaires to the absentees unless the school made the offer, which none did. Otherwise I considered what I collected on the appointed day as final.

The preceding paragraphs served as a backdrop to frame the data collection approach taken and for understanding the numbers for the final sample that was collected.

3.2.7 RESEARCH SAMPLE

As one of the aims of this research was to examine and compare the flow experiences of both primary and secondary school students in Singapore, the research sample consisted of two groups of students: the first group comprised primary five students (aged 10-11) from three primary schools, and the second comprised secondary one students (aged 12-13) from three secondary schools. The rationale behind studying both levels of students stemmed from literature suggesting that student interest in music as a subject in schools waned as they moved up the academic ladder due to increased focus on academic subjects (Ng & Hartwig, 2011), which leads to diminished flow experiences due to the increasingly structured learning (Custodero, 2005). It would therefore be useful to examine if this was also the case in Singapore as an important aspect of understanding students' flow experiences. The cohorts were selected for largely practical reasons. For the primary school cohort, the participants needed to be of sufficient cognitive maturity to be able to understand the nature of the research activities and meaningfully contribute so older students were preferable. Primary six students were a non-starter, as they were involved in the Primary School Leaving Exam, a national high-stakes milestone examination which determined which of the four academic streams the students would enrol in at secondary school level and as such, consent from the school, MOE and parents were unlikely to be forthcoming. As the study also sought to distinguish the experiences of students participating in music CCA activities from those who did not, primary five students were more suitable as they would have had the benefit of at least 1-2 years' participation, as students normally joined CCAs starting in primary three or four and were thus better able to offer insights into their experiences. For the secondary school cohort, only secondary one or two students could be selected as compulsory classroom music lessons are only extended to them. The secondary one cohort was chosen so that the age gap between the two cohorts would not be too

great and to examine if the immediate transition from primary to secondary school had any impact on their flow experiences.

The schools selected were of largely similar background and were typical of most Singaporean primary and secondary schools, catering to the families from the vicinity of the densely populated towns (in which the vast majority of Singaporeans reside) where they were located. Sometimes referred to as 'neighbourhood schools', they were not 'elite' schools which usually comprised a higher proportion of students of higher academic ability and social economic status (SES), taking in students from a wide spectrum of SES and academic ability. For the primary schools, the MOE admission rules gave priority to students living within a 2-km radius of the school, ensuring that their student catchment largely comprised students from the vicinity. For the secondary schools, they offered classes for the three major academic streams which around 90% of the student population fall into, namely, the Express, Normal (Academic) and Normal (Technical) streams[4]. In comparison, the 'elite' secondary schools usually did not offer classes catering to both the normal streams. All the students in the identified cohorts were invited to participate in the study.

As I had to firstly write in to seek permission from the schools' principals to conduct the research and considering the challenges of conducting research in schools set out earlier, I was not able to purposely identify the six schools. Instead, I wrote to a number of schools that I knew met the research requirement for the type of school I was looking for and I continued writing to different schools until I obtained the desired sample. The geographic location of the schools was not a factor as Singapore is a very small country (area around 700 km^2), hence the student population of the type of schools I had in mind would not vary too much in terms of racial distribution and social background.

3.2.8 DATA COLLECTION PROCEDURES

For research to be conducted in Singapore schools, researchers needed to seek many levels of clearance. Firstly, the research project had to be approved by MOE. Having obtained prior ethical approval from IOE to proceed with the research, a request form detailing the research aims, justifications, targeted participants, procedures and research duration had to be submitted to the Corporate Research

4. The fourth stream, the Special stream, is open to the top 10% of students based on their scores in the Primary School Leaving Examination taken at the end of primary six and offered by very few schools.

Office of the Research and Management Information Division of MOE for processing. The role of the Corporate Research Office was to ensure that the research conducted in schools did not concentrate on a selected group of schools so that its students were not subject to over-research. Once clearance had been obtained, the researcher would have to approach the school principals directly to seek permission to conduct the research in the schools, outlining the research procedures and the extent of the students' involvement and the length of time needed to complete the data collection. Finally, as the students were below the age of majority of 21 in Singapore, individual written consent from their parents would have to be obtained for the student to participate in all or any of the research activities. The same data collection procedures were used for all the schools. An email was firstly sent to the principal of the school, informing him/her of the nature of the research and its objectives to seek approval for it to be conducted in the school. Upon agreement, the principal would appoint a teacher as the point of contact and liaison for the project who would be responsible for arranging and facilitating the data collection activities. The liaison officer was usually a middle-ranking teacher in the school, either the head of department or subject head for aesthetics or music, or one of the music teachers. I then arranged for a meeting with the liaison officer at the school to brief him or her on the objectives for the research and the different forms of data collection that would be used.

In all the schools, the liaison officer kindly agreed to assist in collecting the reply slips, which they either personally oversaw or sought the assistance of the class form teachers, or in some cases the class student monitors. While all the teachers made the effort to remind students to return the reply slips, a large number of students nevertheless did not do so. After a waiting period of about two weeks, I deemed the number of reply slips collected as final and indicative of the students' participation rate for the school and proceeded to the data collection phase. In that phase, I personally conducted all the research procedures to ensure uniformity in administering the questionnaires, conducting the focus groups (which were audio recorded) and making video recordings as well as taking field notes for the observed music classes. At the start of the data collection session, I would introduce myself and explain to the students the nature of my research and how they were contributing to it. I would also remind them that the school and their parents had consented to their participation in the study, but that they could withdraw if they wanted. No students who were present at the data collection sessions withdrew.

From the three primary schools, a total of 310 completed questionnaires were collected; for the three secondary schools, a total of 100 were received, making a total quantitative sample of 410 for all six schools: see Table 3.1:

Table 3.1: Breakdown of questionnaires collected by school

School	Size of cohort	No. of questionnaires collected	Male	Female
Primary School 1 (PS1)	225	152 (67.6%)	75	77
Primary School 2 (PS2)	202	72 (35.6%)	47	25
Primary School 3 (PS3)	191	86 (45.0%)	43	43
Sub-total	618	310 (50.2%)	165	145
Secondary School 1 (SS1)	277	6 (2.2%)	2	4
Secondary School 2 (SS2)	275	28 (10.2%)	14	14
Secondary School 3 (SS3)	275	66 (24.0%)	26	40
Sub-total	827	100 (12.1%)	42	58
Total for all schools	1,445	410 (28.4%)	207	203

Out of a combined total of 1,445 students, the research sample represented 28.4% of the cohort size for all six schools.

For the qualitative data, two sources of data were collected: through focus groups and video observations. The participants for the focus groups were selected by the coordinating teacher from the original pool of consented participants to share their experiences during music classes and, where applicable, their music CCAs, giving a total of 12 focus groups. The first group comprised students who were considered not to have any prior music experience, i.e. did not participate in any regular musical activities outside their school music lessons, including both school-based music CCAs and any other private lessons outside of school. The second group consisted of students who were current members of their schools' music CCAs, mainly the choir, wind band, Chinese orchestra or any of the ethnic instrumental ensembles, namely guzheng (a classical Chinese zither), angklung (a traditional Malay instrument), gamelan (a traditional Balinese instrumental group), guitar and harmonica. For balance, each group was recommended to comprise three

male and three female students, though the final composition of each group did not always meet the suggested quota due to student absenteeism or in some cases, the teacher calling up more students to compensate for any potential absentees. To ensure that the students felt at ease, all focus groups were conducted in their respective schools and the teachers were also invited to be present during the sessions. The focus groups were all audio recorded and then transcribed in verbatim by me. Table 3.2 sets out the information on the final composition of the focus groups:

Table 3.2: Composition of focus groups

School	Focus group 1 (non-music)	Focus group 2 (music)
PS1	6 (3 male, 3 female)	6 (3 male, 3 female)
PS2	6 (3 male, 3 female)	6 (2 male, 4 female)
PS3	5 (3 male, 2 female)	10 (2 male, 8 female)
PS total	17 (9 male, 8 female)	22 (7 male, 15 female)
SS1*	4 (3 male, 1 female)	2 (2 female)
SS2	3 (2 male, 1 female)	5 (3 male, 2 female)
SS3	3 (2 male, 1 female)	7 (2 male, 5 female)
SS total	11 (7 male, 4 female)	14 (5 male, 9 female)
Overall	28 (16 male, 12 female)	36 (12 male, 24 female)

** for SS1, both focus groups comprised students with and without music background but the number and gender of students with and without prior music knowledge was as indicated.*

All focus groups lasted around 25-40 minutes and were conducted in English, recorded in audio form and then transcribed, all by the researcher, for reference and analysis. When doing the transcription, I sought to remain faithful to the voices of the students as far as possible, transcribing their statements in verbatim, including recording the statements in their original 'Singlish' form. Most Singaporeans speak in a distinctly localised style of English commonly referred to as Singlish, which reflects the cultural richness of Singapore's ethnically diverse population comprising Chinese, Malay and Indians. This could be in the form of ordering words according to the syntax of any of the other three official languages (Chinese and its dialects, Malay and Tamil) or the insertion of choice words from those languages when speaking in English. While English is the medium of instruction and is taught in all schools at all levels, speaking Singlish comes naturally to Singaporean students as

many come from non-English speaking families and it is their conversational lingua franca. Even Singaporeans with a good command of English are also pre-disposed to speaking Singlish from time to time. As a born and bred Singaporean, I am able to understand the nuances and meanings of the Singlish as used by the students during the focus groups.

For the video observations, I had requested for permission to observe and make a video recording of a music lesson involving a class from the cohort sample at each school, usually the one that had the highest number of consented students. Of the six schools, four (two primary and two secondary schools) gave the necessary consent while the other two declined. Consistent with my approach of not querying the schools' decisions, I did not enquire on the reasons for the rejecting of my request. It should be emphasised here that the video observations are not intended to be the key source of data in this research study and is mainly meant to complement and enrich the data obtained from the quantitative questionnaire and focus groups and give life to the students' flow experiences beyond words and numbers. The acceptability of the small number of classes being observed should therefore be understood from this perspective.

3.3 DESIGN OF RESEARCH

Quantitative data were collected via a self-administered close-ended questionnaire distributed to all participating students on their experiences of flow during their regular music classes. As flow was a phenomenon that had been widely researched and its nine dimensions validated, the use of a questionnaire would enable me to make initial generalisations about flow as experienced by students in the Singapore music classroom (Creswell, 2009). In the Singapore context, as flow in the music classroom had not been widely researched, using a questionnaire at the first instance would allow for a broad understanding of the students' flow experiences to be established within the framework of the nine dimensions that the research could subsequently build upon (Creswell & Piano Clark, 2011). The use of a 5-point Likert scale considered the fact that the research participants were young students, giving them a sufficiently wide spectrum to nuance the depth of their experiences. Also, given that flow is a complex phenomenon, this was not a case where the finer distinctions of a longer scale would shed more light on it (Da Vaus, 2002 p107). At a more practical level, students in Singapore were also used to taking quantitative surveys using graded scales as these were conducted by the schools and MOE from

time to time, so they would have no difficulty understanding its nature and how to complete it.

The qualitative methods chosen to further investigate the students' flow experiences were focus groups with selected students and analysis of video observations of music lessons. These would play a supporting role in terms of providing possible corroboration or triangulation for the initial quantitative findings. Focus groups were selected as the main method for the qualitative approach as it had the advantage of allowing data to be collected from the individual as well as the individual in the context of a larger group (Massey, 2011). As the research study sought to determine the differences in the flow experiences between the primary and secondary school students, collecting the data in their respective groups would enable me to better contextualise and discern any subtle differences in their experiences. It was also hoped that a focus group setting in which the students were with their friends would encourage them to be more forthcoming in sharing their views. Thus far, the data collection methods used in this research study relied on students' recollection of their experiences, so the use of video observations of actual music lessons as the final piece in the data collection jigsaw provided a platform from which I could directly observe how flow manifested itself in the classrooms. The key advantage of using observations was that it provided the researcher with a window to the actual classroom experiences of the students, thus putting life to the students' recollections of their flow experiences. The added advantage of making video recordings of the classes was it potentially allowed me to pick up details that may have been missed out both in the actual observations, and also by the students in the recall process through repeated viewings of the lessons (Jewitt, 2011).

While there was no fixed sequence to the data collection, the quantitative data was collected and analysed first to establish a broad understanding of the nature of the students' flow experiences in music class. Following that, the qualitative data was then analysed to triangulate and/or affirm the initial findings or establish independent findings. I believed that this approach was most suitable for the research study as this would also give the research findings a macro-to-micro flow, allowing for the qualitative findings to add nuance to and enrich the broad strokes of the flow experiences painted by the quantitative findings.

3.3.1 DEVELOPMENT OF QUANTITATIVE RESEARCH INSTRUMENT

From a scan of the literature, I was only able to find one tool specifically designed for exploring flow in music classes: the Flow in Musical Activities (FIMA) form developed by Custodero (1998). This instrument had been developed for the pre-school context to be used by teachers 'assessing' the degree of flow observed in individual children during music class. Due to the very young age of the children, FIMA relied totally on teachers' inputs and lacked the authenticity of the children's voices in expressing their flow experiences, something which I felt was crucial so I decided it was not suitable for use in this research. As I found no other available flow instrument or tool developed for use in the music classroom context that met my needs, I decided to develop my own by adapting from existing ones used in studies on flow in other domains. I eventually found two that could be used.

The first instrument, known as the Flow State Scale (FSS), was developed by Jackson and Marsh (1996) to measure the flow experiences of elite athletes through its nine dimensions after they had completed sports activities. The FSS was developed by examining the nature of the nine dimensions of flow and then wording the instrument items to describe experiences during sporting activities corresponding to each dimension. The items were evaluated and validated by seven experts in flow theory who provided feedback on refinement of the wording and relevancy to the flow dimensions. An initial instrument comprising 54 items was piloted on 252 athletes and from there, further refined and reduced to 36. The final version was applied to a sample comprising 394 athletes aged 14 to 50 from the US and Australia representing 41 different sports with experience ranging from 1-37 years. When answering the questions, the athletes were told to recall a particular sporting experience in which they had felt great enjoyment or optimal performance.

As this instrument was intended to measure specific flow experiences immediately after the event, it may not have been particularly suitable for direct application in the current study, which focused on students' recollection of experiences over a period. Also, while the wording used in the FSS was generic in nature, I felt that the wholesale adoption of the FSS, being an instrument specifically developed for sports, might not be wholly adequate in an education setting. E.g. FSS item 2 – *I made the correct movements without thinking about trying to do so.* The immediacy implied by the wording of the item, with its reference to movements, underlined its intended use in the context of immediate recall after sports activities and was not appropriate to be directly transplanted for use in the context of students

recalling musical activities that had taken place over a period. Nevertheless, I was impressed by the fidelity of the FSS to the flow concept, attempting as it did to measure all the nine flow dimensions quite comprehensively. While it was designed for the sports context, as the experience of flow is largely consistent over different activities (Csikszentmihalyi, 1975), I decided it was worth adapting suitable items for the purposes of this research.

To address the concerns regarding the FSS' intended use for immediate recall in a non-education context, I decided to adapt additional items from a second instrument developed by Shin (2006), which explored flow in the online learning context. Shin's instrument was designed to examine the flow experiences of Korean university undergraduates in a virtual learning environment. He adopted a flow framework that was widely recognised and designed for the online learning environment, which had 13 sub-constructs (as opposed to nine flow dimensions) that divided the flow experience into the pre-flow (antecedent), flow and post-flow (consequence) phases. Specifically, he wanted to find out if there was a significant relationship between the skill-challenge balance and the actual flow experience, and if having flow experiences resulted in student satisfaction (enjoyment) with the online course. A total of 23 items were designed for the five constructs under the flow phase, namely enjoyment, telepresence, focused attention, engagement and time distortion, and validated by a panel of five psychometric experts and confirmed by factor analysis. The instrument was then used in his study, in which 525 undergraduates took part[5]. As the items from Shin were not strictly classified under the nine flow dimensions, I selectively chose suitable items that fit into the nine dimensions and classified them accordingly.

I found Shin's instrument helpful in terms of its similarity to this research project in two respects. Firstly, it was designed to investigate flow experiences in the learning context, and secondly it attempted to measure students' flow experiences over a period of time. E.g. Shin 5th item of the construct of focused attention – *When watching the lecture, I am unaware of what is going on around me.* The education context of Shin's investigation is immediately apparent, and the item is worded more suitably to stimulate students' recall over a period.

5. In my opinion, Shin's reporting of his research did not seem to be very clear and there appeared to be information gaps. For example, he did not make clear how he measured the post-flow phase and focused largely on the five constructs of the flow phase.

In summary, neither instrument was wholly satisfactory for use in the context of this research; by selecting a combination of items from both and judiciously adapting them where required, I hoped to make use of the strengths of each to compensate for their respective weaknesses. In addition, both instruments had high reliability factors and were therefore suitable for adaptation in the sense that they were both able to effectively measure flow: the FSS had an overall Cronbach's Alpha value of .83 (Jackson & Marsh, 1996 p25) based on the mean of its nine constructs (corresponding with the nine flow dimensions), while Shin's was .80, based on the mean coefficient of the four constructs the items were derived from (Shin, 2006 p713).

In developing the instrument, I also decided that I wanted to focus on some of the dimensions that had been highlighted as being more significant in flow research and also easier to understand, namely autotelic experience (enjoyment), clear goals, skill-challenge balance, unambiguous feedback and concentration. For some of the other dimensions, namely action-awareness merging, loss of self-consciousness and transformation of time, I felt that these were concepts that may prove somewhat challenging for students aged 10-14 to comprehend so I decided to include fewer items for those. All the selected items from the FSS and Shin's instrument were then further revised and adapted for use in the music education context and to ensure that its language was kept simple and could be understood by the wide spectrum of the students' language abilities, especially the 10-12-year-olds, while retaining the intent and meaning of the original. To that end, I asked two experts in the field of music psychology to vet and validate the adapted items both to ensure fidelity with the meaning of the originals and that the items were fit for the music education purposes of this research. I sent my adapted versions of the items to the experts, who provided feedback to refine and clarify the wording of the items, whereupon changes were made. The experts then cleared the further revised items, and the finalised wording was used in the pilot study (please refer to Appendix 1 for item adaptation table).

E.g. 1: FSS item 2 – *I made the correct movements without thinking about trying to do so.*

I felt that this item captured the 'automaticity' of the dimension of action-awareness merging succinctly and decided it should be adapted by using words suitable to describe a similar state during music lessons.

Original adaptation – *During performance, I play/sing the correct notes without hesitation.*

The experts felt that the word 'performance' referred to a particular type of musical activity that may not take place frequently in class to be meaningfully incorporated into the item, so they amended it to something more generic and broadly applicable in the context of the music classroom.

Final adaptation after feedback from experts – *During musical activities in class, I play/sing the correct notes without hesitation.*

E.g. 2: Shin 5th item of the construct of focused attention (concentration) – *When watching the lecture, I am unaware of what is going on around me.*

I had selected this item as it clearly described the state of students when concentrating and similarly adapted it for the music classroom.

Original adaptation – *During music lessons, I am unaware of what is going on around me.*

The experts felt that the context was ambiguous and needed greater clarity with regard to the music classroom context and also to heighten the sense of 'absorption' when in deep concentration.

Final adaptation after feedback from experts – *During music class, when listening to the teacher I am so interested that I am unaware of what is going on around me which is not related to the music class.*

The final number and distribution of the items by flow dimension reflected conscious decisions on my part based on a number of considerations. Firstly, from my own experience in developing an instrument measuring musical aptitude in Singapore, as with the approach adopted by Jackson and Marsh, we had started with a large item bank of 50 items. After field tests to determine the reliability of the individual items, the final instrument had a total of 36 suitable items and this provided the instrument with a sufficiently high overall Cronbach alpha reliability factor of > .8 to meet its purpose of a screening tool for identifying student's musical potential. In a similar vein, I was assured by the fact that the FSS also had 36 items, which enabled it to be sufficiently detailed yet could be completed within a short time, both of which I regarded as key requirements for my research instrument.

Based on these observations, I decided that the instrument should ideally have a total item quantity of 30-40 items to be sufficiently long enough to achieve sound reliability and rigour but short enough to be completed in a reasonably short amount of time. The items I eliminated were those I felt were either difficult for

students to understand, or which I found problematic to adapt. E.g. the wording for FSS item 11 – *Things just seemed to be happening automatically.* Unmodified, the wording of the item could be understood to refer to 'things' that were happening around the student rather than the experience itself. I found my attempts to make this item understandable unconvincing and unable to adequately capture the meaning of the original wording without the use of difficult words the students might not comprehend. I felt that this probably reflected the inherent difficulty of the concept of action-awareness merging, hence I decided not to adapt this item.

When determining the number of items per dimension, I was guided by the literature in terms of what my research questions sought and hence chose not to follow the approach used by Jackson and Marsh (1996) of allocating the same number of items per dimension. As I was seeking to understand how flow could be facilitated in the education context, the flow precedents of challenge-skill balance, clear goals and unambiguous feedback were hence allocated more items as these were related to the role of teachers in bringing about flow. The literature had also mentioned the importance of concentration as having an important influence on the other flow experience dimensions (Beard, 2015). Finally, autotelic experience was the decisive dimension that defined the flow experience, especially in the music context. I therefore decided to allocate more items to the aforementioned five dimensions. The final version of the adapted instrument designed for measuring flow in the music classroom had a total of 35 items, with 23 adapted from Jackson and Marsh and 12 from Shin (please refer to Appendix 2 for instrument items indicating origin and flow domain breakdown, and Appendix 3 for final version of instrument administered).

Table 3.3 shows the final number of items in the instrument by flow dimension:

Table 3.3: Flow instrument item adaptation table

Flow dimension	No. of items
Challenge-skill balance	4
Clear goals	6
Unambiguous feedback	4
Concentration	5
Action-awareness merging	2

Flow dimension	No. of items
Sense of control	3
Loss of self-consciousness	3
Transformation of time	2
Autotelic experience	6
Total	35

The items were framed in the form of statements relating to the students' experiences of flow based on their recollection of music classes they took part in over the past six months. The items required responses using a five-point Likert scale ascending from: 1 = strongly disagree, 2 = disagree 3 = neutral, 4 = agree, to 5 = strongly agree, reflecting the students' perceptions of the intensity of their experiences. I had chosen to use a 5-point scale for a number of reasons. Firstly, as the instruments from the FSS and Shin also similarly used 5-point Likert scales in ascending order, no adaptations in this respect were required, and the items also retained some measure of their original psychometric robustness. Secondly, the ascending Likert scale was more intuitive in that the scale rated increasing levels of agreement and would be easier to analyse as higher numbers reflected higher levels of agreement, and hence more positive experiences. Thirdly, it had been noted that having too wide a rating scale often confused the respondents (Da Vaus, 2002). In the context of quantitative research involving children, this could be exacerbated as they may not be mature enough to discern the nuances of the intervals in a wide rating scale. Increasingly, there is recognition among experts that research involving children needed to take into account their needs rather than treating them as 'mini-adults', hence the need to ensure that the instrument was designed appropriately (Fargas-Malet, McSherry, Larkin, & Robinson, 2010). I felt that the wording describing the different Likert scale intervals showed clear gradation and provided adequate guidance for the children to respond to the items intuitively. All the items were also positively phrased so that all the responses had a direct correlation with the level of agreement for consistency of student responses and to ensure that students were not confused by the sudden insertion of negatively phrased questions. The original wording of the items in the FSS and Shin was also phrased in the positive so adopting a similar approach would have the added advantage of better fidelity to its meaning. As the questionnaire was intended for all students without regard to their background, I did not deem item discrimination to be an issue. Also,

as the flow experience comprised the same nine dimensions regardless of age, there was no need to word the items differently for the different school levels. On my part, I tried to ensure that the wording of the questions was uncomplicated and understandable by both the primary and secondary school students.

Finally, in addition to the quantitative data for analysis, the questionnaire also collected information on the student's involvement in any additional regular musical activities outside their music classes, particularly music CCAs. This was to facilitate investigating if additional regular musical experiences outside the music classroom had an impact on their flow experiences.

3.3.2 Pilot study for quantitative instrument

A pilot study was conducted in advance of the main study with the following objectives:

- To test the properties of the quantitative flow measurement instrument and obtain feedback on the individual items so as to make refinements and adjustments, if necessary
- To trial the implementation system for the study on a small scale to determine the feasibility of the eventual sample size and data collection methods to be used
- To familiarise the researcher with the mechanisms and processes for seeking research consent in Singapore

The pilot sample consisted of a cohort of primary five students (10-12-year-olds) across six classes from a primary school in Singapore. The school was selected based on it being fairly representative of most primary schools in Singapore, which are located within densely populated towns and typically have students from a wide spectrum of family social-economic backgrounds and academic ability. The processes for obtaining permission to conduct research, which would be the same for the main study, namely through MOE, the school and parents were followed through. The procedures for administering the research were also tried out and found to work. In the end, written consent of parents was received from a total of 152 students to be involved (N = 152), comprising 75 male and 77 female participants. The analysis revealed that the mean score or the overall measure of flow for all students (N = 152) was 3.74.

3.3.2.1 Reliability of instrument

Checking the reliability of an instrument ensures that it produces consistent outcomes of what it purports to measure, e.g. two students who had high flow experiences during music class should both score highly on the instrument. Before a psychometric instrument can be applied, it needs to be established as having internal consistency, i.e. the items need to be correlated or measure the same thing it purports to (Tavakol & Dennick, 2011). It is the level of internal consistency that establishes the extent of the instrument's reliability. I chose to analyse the instrument's reliability using Cronbach's Alpha, as it is one of the most widely used reliability coefficients. A potential issue that arose as a result of the design of the instrument in this regard was that as it sought to measure all the nine dimensions of flow, it could not be said to be unidimensional, i.e. it could not be said to measure the 'same thing' as each flow dimension was distinct, hence any measurement of the 35-item instrument as a whole may not be an accurate reflection of its true reliability (see in general Schmitt, 1996; Tavakol & Dennick, 2011). To mitigate this flaw, I used Cronbach's Alpha to measure the reliability of the set of questions for each flow dimension.

The Alpha values of the instrument and the individual flow dimensions as measured in SPSS are set out in Table 3.4:

Table 3.4: Reliability of instrument by flow domain (pilot study)

Domain	No. of Items	Cronbach's Alpha
Overall for instrument	35	.97
Challenge-skill balance	4	.81
Clear goals	6	.82
Unambiguous feedback	4	.73
Action-awareness merging	2	.65
Concentration	5	.80
Sense of control	3	.81
Loss of self-consciousness	3	.62
Transformation of time	2	.82
Autotelic experience	6	.92

On the issue of interpreting Alpha scores, though such factors as number of items and sample size matter, it has generally been thought that scores of more than .7 are considered reliable, while scores of more than .6 are still quite acceptable, especially given that the instrument was not measuring anything involving high stakes (Field, 2013).

The overall reliability of the instrument was therefore strong (.97) while that for the various flow domains were also good, with the lowest values seen in the action-awareness merging and loss of self-consciousness dimensions, with Alpha scores of .65 and .62 respectively. It was noteworthy that the dimensions with values that were at the 'acceptable' level were those with fewer items (loss of self-consciousness: .62 – 3 items; action-awareness merging: .65 – 2 items).

3.3.2.2 Analysis of data

Based on the mean score for the overall measure of flow being moderately high at 3.74 (>3.5), this suggested that in overall terms, the students did have flow experiences to at least a moderate degree during music class. Additional analysis of differences in flow scores, comparing students who had participated in regular musical activities outside the classroom, which included students who were current or ex-members of music CCAs or engaged in regular musical activities outside school hours, and those who had no such experiences also showed no significant difference (p = .62): those without additional musical enrichment (N = 103) had a mean score of 3.72 while those with additional experiences (N= 49) scored marginally higher at 3.78. This would appear to affirm Csikszentmihalyi's belief that flow is not dependent on the level of expertise acquired in the activity and can be experienced by everyone (Csikszentmihalyi, 1990).

Further analysing the flow experience based on the nine domains revealed the following data in Table 3.5:

Table 3.5: Mean score breakdown by flow domains

Flow domain	N	Mean	SD
Challenge skill balance	149	3.62	.79
Clear goals	146	3.77	.76
Unambiguous feedback	150	3.95	.83

Action-awareness merging	147	3.44	.92
Concentration	150	3.77	.74
Sense of control	151	3.75	.80
Loss of self-consciousness	147	3.56	.88
Transformation of time	150	4.03	1.01
Autotelic experience	151	4.14	.89

Looking at the scores, it would appear that flow experiences in the domains of autotelic experience (4.14), time transformation (4.03) and unambiguous feedback (3.95) were somewhat higher than for the others: a gap of .18 was observed between unambiguous feedback and the next highest domain score for clear goals (3.78). The highest scoring domain being autotelic experience would appear to reinforce the observation made by Csikszentmihalyi and Schiefele (1992) that music is an inherently enjoyable (and hence flow-rich) activity. Also, the high score for unambiguous feedback (3.95) might be significant in the education context, implying the potential importance of the role of teachers in providing external feedback in enabling flow experiences, which was something already alluded to earlier (see also in general Custodero, 2002).

The lowest scores observed were in the domains of loss of self-consciousness (3.56) and action-awareness merging, which was the only domain score that fell just below 3.5 (3.44). Interestingly, these were also the domains that reflected the lowest reliability scores. This might suggest that in the context of the everyday music classroom, these two domains are less pre-eminent in the flow experience given that the activities are tailored towards mass participation and therefore not intended to be too challenging. This would not be surprising given that classroom music activities tend to be shorter, simpler and usually broken down into smaller chunks for easier consumption and to fit short lesson times (30 minutes) and therefore not conducive to ‘generating’ these flow dimensions. The low score for loss of self-consciousness also echoed the findings of two other psychometric studies of flow in the music learning context (Sinnamon et al., 2012; Wrigley & Emmerson, 2013), which were conducted on full-time music students in universities. A qualitative study by Garces-Bacsal et al. (2011) on artistically talented students from

Singapore's School of the Arts also found that their flow experiences did not strongly reflect the dimension of action-awareness merging. It would therefore appear that these dimensions are especially problematic in music and may not be that prevalent in either the flow experiences of advanced or novice musicians.

3.3.2.3 Feedback on instrument items

Feedback was sought from the students on the wording of the instrument items, focusing on whether students had issues understanding the meaning of the questions, or if they were in any way unclear. The students responded that they generally had no difficulty understanding what the questions were asking. This was corroborated by my observations during the data collection sessions, in which I encountered very few clarifications from the students on the items. Also, the administration of the questionnaires took around 10-15 minutes at all the sessions, including the administrative briefing. Inspecting the students' individual responses, while they were fairly positive in general, there was a range of responses in each questionnaire which suggested that students did indeed read through each item and respond accordingly rather than lazily select the same answer for each item.

3.3.2.4 Conclusions from pilot study

The pilot study largely went well and achieved the objectives stated at the beginning of this section. The instrument proved to be fit for purpose and the experience had been invaluable in identifying minor kinks in the field management of the study that were ironed out for the main study. Considering the students' feedback on the instrument and the lack of issues encountered, coupled with the instrument's high reliability scores, I concluded that it was not necessary to make any changes to the wording of the instrument items and I decided to include the data obtained in the pilot study as part of the main study. On the administrative side, the process of obtaining the different levels of clearance needed to conduct the research and the actual research administration also went smoothly and provided confidence that those processes were sound and would not pose too many issues when the main research was conducted.

3.3.3 Approach to quantitative analysis

Each completed questionnaire submitted by the students was issued with a unique identification number and the data collected was collated and analysed using

version 26 of the Statistical Package for Social Sciences (SPSS) software run on an Apple MacBook laptop. The first stage of analysis involved examining the students' responses through the lenses of descriptive statistics to establish an initial understanding of their flow experiences. Each of the responses in the 35-item questionnaire was accorded a numeric score ranging from 1-5 as outlined earlier and SPSS calculated the overall mean flow score as well as the mean score for each flow dimension for each student. In cases where students did not respond to all the items, SPSS by default discarded these scores, usually resulting in sample sizes lower than the actual numbers in both the overall as well as flow dimension scores.

The students' scores were firstly analysed by flow dimension based on the items ascribed to each dimension to gain further insights into the prominence of each in the overall flow experience. The flow dimensions for the combined primary and secondary school sample were ranked based on their mean flow scores to establish which dimensions were most prominent in the overall flow experience. The flow dimensions of the overall sample were then ranked and compared by prior music experience to establish the extent to which there were similarities in the flow experiences of students based on those groupings. The flow scores for the primary school and secondary school samples were then similarly ranked by flow dimension and compared by prior music experience to examine the nature of the flow experiences of the students in these two groups. The ranks of the flow dimension scores of the primary and secondary school samples were then themselves compared by prior music experience to determine if there were similarities in the flow experiences.

T-tests were then conducted to determine if there were significant differences in the students' flow scores to examine if prior music experience had any impact on students' flow experiences in the following groupings: the combined sample, the primary school sample and the secondary school sample. In addition, t-tests were also conducted to compare the scores of the primary school sample with those of the secondary school sample to examine if the flow experiences of students at different levels of schooling differed, and if so in what respects.

Finally, exploratory factor analysis was conducted to establish whether the data supported Csikszentmihalyi's original proposition of flow experience based on nine dimensions. Most flow research in music education sought to measure the extent of research participants' flow experiences based on the established nine dimensions, with some conducting confirmatory factor analysis to check that their

data conformed to the model of a nine-factor solution (see e.g. Sinnamon et al., 2012; Wrigley & Emmerson, 2013). In this research, I sought to go one step further to determine if the data of the flow experiences of Singaporean students in music classes deviated from the nine-dimension model, and if so in what ways. While the nine-dimension flow model has been largely accepted as a fait accompli, I felt it would be meaningful to examine Csikszentmihalyi's original assertion that all the nine dimensions were necessary for flow to take place in the context of his more recent remarks suggesting that some flow dimensions were possibly more significant than others in the overall experience. This was especially so given other literature had suggested there were nuances of flow that were influenced by the prominence of certain dimensions in the experience (Wright, Sadlo, & Stew, 2007).

3.3.4 Development of qualitative approaches

Compared to the more established quantitative data analysis approaches and standards, qualitative approaches are somewhat less well-defined; as such, questions of the reliability and validity of qualitative analysis arise. Acknowledging that qualitative research methodologies were not compatible with the fixed procedures and standards that provided the rigour in quantitative research, Yardley (2000) proposed the following as characteristics of good qualitative research:

(a) Sensitivity to context – the research being grounded in established theory and literature pertaining to that theory;
(b) Commitment and rigour – thoroughness in the investigative and reporting processes of the research;
(c) Transparency and coherence – the transparency in the reporting of the data collection and analysis and its persuasiveness; and
(d) Impact and importance – the value of the research to its intended community.

Sensitivity to context refers to the research being grounded in established theory and literature pertaining to that theory. As flow is a phenomenon, qualitative interviews are a common means of data collection and analysis in flow research as it allows the participant to articulate his/her experience and better facilitate the researcher's understanding (Jackson, 2012). Csikszentmihalyi himself used interviews in establishing the nine dimensions of flow (Csikszentmihalyi 1975). As explained earlier, focus groups were used as the method of collecting qualitative data from the students on their experiences as this provided the supportive platform

needed for them to articulate their ideas freely. While video observations were less commonly used in flow research, they were nevertheless used extensively by Custodero in her research on flow in young children (Custodero 1998, 2005).

My attempts to honour the remaining three characteristics are elaborated in the following paragraphs, which elaborate on the development of the focus groups and video observations.

3.3.4.1 Focus groups

Focus groups are often used in mixed methods research to triangulate and also to explain unexpected outcomes and explore the processes behind quantitative outcomes (Cohen et al., 2011). This was selected as the main method for collecting qualitative data in this study. The key characteristics of a focus group are as follows: a semi-structured session, multiple participants who usually share a common background or experiences, an informal setting and utilising the dynamics of a group setting through a facilitator (see in general Carey, 2015). The format of the focus group is said to be particularly useful when the participants are young students, as they were in this case mainly aged 10-11 and 12-13. The presence of their friends, an informal atmosphere and a neutral facilitator provided the non-threatening environment needed to encourage them to share their honest views and experiences with less inhibition (Cohen et al., 2011). For instance, focus groups were used in a flow study examining the link between flow and motivation of a group of high school students engaged in artistic activities (Beese & Martin, 2019). These conducive conditions are particularly essential in an East Asian society like Singapore where students are generally more reserved and not so given to expressing their opinions. It was also hoped that collecting qualitative data from a bigger pool of students would elicit a wider range of responses, and with it the potential of uncovering convergences and enable more general observations to be made in their classroom music learning experiences (Vicsek, 2010). Compared to conducting interviews involving single students, this would also allow the views of more students to be obtained efficiently as it uniquely reflected both the views of the individual student speaking as well as the particular group of students they represented (Massey, 2011).

The focus groups were conducted in a semi-structured format, with a reference list of open-ended questions guiding the discussion that encouraged the students to speak freely while allowing me to ensure focus on the key points of the

conversation (see Appendix 4 for schedule of questions). The semi-structured format allowed me to keep to clearly defined lines of inquiry while allowing for the flexibility to respond to and explore additional issues the students may have raised in their answers. I started by thanking the students for their participation, explaining the purpose of the research, assuring them of the confidentiality of what they said, and encouraging them to speak their minds and contribute to the conversation. The opening set of questions asked them generally about their attitudes towards listening to and making music and were intended to get the students to start talking and put them at ease, but was also an opportunity for me to better understand their personalities so as to better aid my facilitation (Carey, 2015):

> "How do you feel when you listen to music? Why? Do you prefer to listen to music by yourself or with friends? Do you feel the same when you make music?"

The remaining questions were more directly related to gaining a better understanding of their flow experiences in class. E.g.:

> "Do you find that time passes very quickly or very slowly during music lessons? Can you remember occasions when time passed quickly or slowly?"

In order to mitigate the potential of 'group think', I asked additional questions to the participants that would cause them to recall and provide details of specific experiences, e.g. the above question, '*can you remember…*' (Carey, 2015). I personally conducted all the sessions, ensuring a level of consistency of approach and management. During the facilitation, I made sure that the conversation was not dominated by the more eloquent students by proactively engaging those I noticed were more reticent in giving their views. I also sometimes made it a point to ask every student to respond to the question to ensure that everyone contributed to the discussion.

Unlike the quantitative questionnaire, the questions for the focus groups were not piloted for a number of reasons. Firstly, during a feedback session for the pilot for the quantitative instrument, the students had indicated that they did not have any issues understanding the meaning of the items. As the questions for the focus groups used the same kind of language and touched on the same areas as the questionnaire, I therefore decided that it was not necessary to pilot it. Also, the qualitative questions did not face the same inherent issues of validity and reliability that a quantitative survey brought. Overall, I felt that the questions were quite clear and I was expecting the students to answer them directly, though I was also

confident that my years of experience in conducting focus groups in my work had equipped me with the necessary skills to facilitate or take advantage of any 'unexpected' responses.

3.3.4.2 Video observations

While the focus groups were useful in painting a broad picture of students' experiences during music lessons, like the quantitative questionnaire, the data collected was based on selective recall as the students were asked to reflect on music lessons they had over the past year. As such, the sense of currency and spontaneity was somewhat lacking in the data. Therefore, I decided to collect additional data via direct observations of the students' music lessons using video recordings at each school to complement and supplement the qualitative data from the focus groups. The use of classroom observations to collect additional data takes advantage of its directness, allowing for a firsthand authentic view of the flow phenomenon (or not) in the classroom without any filtration through the students' perspectives, and has been said to be highly useful in complementing other forms of research techniques (Robson, 2011, see chapter 13 in general). Flow being a phenomenon, it would seem apposite to apply observations as one of the research techniques in its investigation for a first-hand view of how it is manifested in the classroom. The video recordings would allow the lessons to be analysed in greater detail, providing real time perspectives on the students' classroom experiences and how flow plays a role therein (Jewitt, 2011). From a wider perspective, observations of activities and interactions among students and teachers could also help me build insights on how music lessons were conducted in the Singaporean classroom (Simpson & Tuson, 2003).

To minimise potential ethical issues, I chose the class from each cohort that had the highest number of students who had consented to participate in the research. For the students who did not consent, as it was neither right nor appropriate to exclude them from their music lesson, I had asked that they be moved to the back of the class and I positioned my video camera somewhere halfway along the side of the classroom, and at an angle where they would not be caught on video. This angle proffered the additional advantage of capturing the profile view of the teacher and students, enabling their interactions to be better recorded and subsequently studied (Erickson, 2006).

Having positioned the camera, I took up position behind it where space allowed, or if not, at another position in the classroom, where I was able to observe the lesson but out of the camera's field of vision. As most of the music classes were conducted in a rather static manner, i.e. didactically, where the teacher stood in front of the class and the students seated before him/her, the entire lesson could be adequately captured without having to pan the camera's field of vision or change its position. In one of the lessons where the teacher had conducted a fluid lesson in which the students moved around the classroom, she ensured that the activities largely remained in the camera's field of vision. All this ensured that the subsequent analysis of the lesson can be done in a neutral manner as the static camera angle captured the continuous interactions between the students and teachers during the lessons without focusing on specific events, which might otherwise unduly influence my focus or cause me to miss out other events that might be taking place at the same time (Erickson, 2006). Though the students had been informed of the recording at the start of the lesson, minimising my movement in the classroom and that of the camera also helped them 'forget' my presence and the fact of the video recording, allowing them to behave in their usual selves and giving authenticity to their actions.

To further make the lessons as authentic as possible, I did not suggest to the teachers what type of lesson to teach, even though it was possible for me to propose activities or topics that were more conducive to generating flow. Leaving it up to the teachers to teach whatever they had planned for the lesson that had been designated for the recording made the setting more naturalistic, enabling me to take snapshots of everyday music lessons in 'real world' settings as they took place in these four typical Singapore schools. As I understood that Singaporean music teachers can sometimes be too helpful to a fellow colleague – some had indeed asked if I would like them to conduct a particular type of music lesson – I also did not explain to them in detail the nature of flow to ensure that they did not purposely design or choose a lesson which was more conducive to its occurrence. The teachers therefore conducted the music lesson they had planned to teach that day, resulting in four lessons that ranged from being flow-rich to flow barely emerging.

3.3.5 ANALYSIS OF QUALITATIVE DATA

3.3.5.1 Focus groups

The analysis of the focus group data was conducted in two stages. At the first stage, the data was analysed broadly to paint a picture of the activities and happenings in the music classroom of Singaporean schools to gain a broad understanding of the students' learning experiences. At the second stage, the key experiences distilled at the first stage were then analysed through the lens of flow to determine if the various dimensions of flow were manifested and if so, in what ways. The second stage qualitative findings were then compared with the quantitative findings to determine if the latter was supported vis-à-vis the nine flow dimensions and more importantly, give greater depth to the understanding of the nature and quality of the students' flow experiences. The decision to analyse the focus group data from a general music education perspective rather than mapping the data to the flow dimensions at the first instance was deliberate as I wanted to portray the students' experiences in as naturalistic a setting as possible. Given that I already had a clear idea of the features of the flow experience, this was also to prevent myself from falling into the unconscious trap of mining for flow-like features from the data and ignoring the wider significance of the students' musical learning experiences, or missing the woods for the trees, as it were (Braun & Clarke, 2006).

As the objective behind the qualitative part of this research was to understand the student's experiences in the classroom context in the words of the students themselves, a thematic approach was adopted for the analysis to surface patterns in the data. The process of analysis adopted the six-step approach delineated by Braun and Clarke (2006 p87):

(a) familiarising oneself with the data;
(b) generating initial codes;
(c) searching for themes;
(d) reviewing themes;
(e) defining and naming themes; and
(f) producing the report

Under this approach, I firstly looked through the transcripts of all 12 focus groups to code key points mentioned by the students in relation to their music classroom experiences within each focus group. Following from that, I clustered all the key points raised across all the focus groups that shared common threads or may suggest a pattern to the experiences under broad 'themes'. Guided by these broad

themes, I attempted to paint a picture of the students' experiences. As an illustration, two responses to the general question of how the students found their music class and whether they looked forward to it, and my approach to coding and theming the data follow:

Example from PS1, FG1 (CCA), student (female)	
Data	Code
Yes. Because music lessons just like, help you feel a little more refreshed.	Provides a refreshing experience
Then when you sing you just feel like you want to tell the whole class that you are like, good at singing and show your talent.	Showcasing self
Example from PS3, FG 2 (non-CCA), Student	
Data	Code
I also think it's better than other subjects because if you keep listening to the teacher all day long talking, talking, talking, later you still need to use your pencil or pen and need to keep writing and do the homework.	More interesting than other academic subjects
But then music you can like, enjoy yourself	Enjoyment
and express yourself.	Self-expression

Different forms of thematic analysis were conducted at each of the two stages of inquiry. An inductive approach, i.e. surfacing the themes directly from the data without consideration of the research question, would be germane at the first stage of the investigation to compose a 'thick' description of the students' learning experiences in the music classroom to better understand their nature (Hennink, Hutter, & Bailey, 2011). At the second stage, a theoretical thematic approach was adopted, informed by my interest in flow which drove this research. This enabled me to code the data more specifically towards building an understanding of the students' flow experiences based on my understanding of the nine flow dimensions and form the basis for the building of a 'theory' of the quality of the students' flow experiences (Braun & Clarke, 2006).

In analysing the focus group data, I considered the possibility of using computer software, namely NVivo, to aid in the analysis. There were certainly advantages to be had in using such software, such as efficiency in the data management process by leveraging the AI to assist in the identifying of themes, and the possibility of adopting a 'statistical' approach to qualitative analysis by tallying the recurrence of certain key words in the dicta. However, I eventually decided against

using the software for a number of reasons. Firstly, as I was not very experienced in conducting qualitative research, personally doing the analysis would provide a valuable learning to me as a researcher. Secondly, I felt that the process of going through the data would allow me to be more familiar with the data at first hand and better gain insights into the students' thinking. To do so, I manually coded the data on hard copy printed transcripts of the focus group dicta. Finally, as this was my PhD thesis, I felt it was important for me to both be familiar with all aspects of the content and be in control of the analytical processes to inform the research decisions.

3.3.5.2 Video observations

The approach to the analysis of the video data follows on from the naturalistic approach set out in the preceding sub-section on focus groups. Two levels of analysis were conducted: from the angle of setting out the nature of music lessons in Singapore, followed by a subject matter content focus on flow (Erickson, 2006). It was hoped that this two-stage approach would paint a more authentic picture of music lessons in Singapore, while also allowing for a more naturalistic investigation of how flow manifested itself in the classroom. Firstly, the recordings were analysed in one-minute segments to provide micro details of what was going on at that time during the lessons. These details were then themed to paint an overall picture of the lessons, e.g. pedagogy, teacher-student interaction, activity etc to set the context for understanding flow in the classroom (Simpson & Tuson, 2003). This more 'neutral' approach would also go some way in addressing the issue of potential observer bias, in this case, the assumption that flow would occur and hence deliberately looking out for its manifestations. As such, I devised an observation schedule that recorded the interactions between the students and teachers to inform the emergent themes and possible flow dimensions observed. A sample of the schedule is at Appendix 5. At the next level, the recordings were re-analysed also in one-minute segments through the lens of flow to determine if any of its dimensions were present during the lessons and if so, how pervasively, e.g. the level of concentration of the students, whether students enjoyed the activities, did the teacher set out clear instructions and expectations for the lesson etc (Simpson & Tuson, 2003). Finally, the recordings were analysed to focus on specific events in which the flow dimensions were manifested and how it ensued.

To aid me when analysing the video data through the lens of flow, I devised an observation table based on my experience as a teacher and my understanding of

the literature on how the characteristics of the different dimensions might manifest themselves in the classroom (Erickson, 2006). The table is set out in Table 3.6:

Table 3.6: Observation table of flow dimension characteristics

Flow dimension	Observable manifestations
Challenge-skill balance	• Teacher breaks lesson activity into different segments of increasing difficulty • Teacher adopts teaching approach that takes into account the difficulty of the activity and current student ability to perform the activity
Clear goals	• Teacher tells students of lesson objectives • Teacher explains lesson activity
Unambiguous feedback	• Teacher asks students for their views on their performance of the activity • Teacher gives and explains his/her views of the students' performance of the activity • Teacher gives students feedback on how to improve their performance of the activity • Students share their opinions on their own or their peers' performance of the activity
Concentration	• Class is watching and paying attention as the teacher explains the activity • Students do not do anything unrelated to the lesson while the teacher is explaining • Students do not disrupt the class
Loss of self-consciousness	• Students are fully engaged in the activity • Students do not hesitate when carrying out activity • When doing the activity, students are not bothered by what their friends think of what they do to carry out the activity
Action-awareness merging	• Students are able to carry out the activity successfully in a fluent manner • In doing the activity, students are able to multi-task and carry out a few actions and thought processes at the same time
Sense of control	• Students are allowed to make decisions on how they want to conduct the activity • Students are able to continue with the activity even when they make mistakes
Time transformation	• Students are surprised that the lesson has ended • Students express surprise when they realise that the lesson has ended

Flow dimension	Observable manifestations
Autotelic experience	• Students show enjoyment while doing the activity (e.g., laughing, excitement) • Students try continuously to accomplish the activity • Students show happiness at completing the activity • Students show enthusiasm when discussing or preparing for activity

When analysing the data, I also referred to the field notes I took of each lesson to supplement the analysis and observations, where necessary. This overall analytical approach mirrored that used in the focus groups in examining the comings and goings of the music lesson and through those findings, link the observations with flow.

3.4 ETHICS

According to the British Educational Research Association (BERA), the researcher should consider the following areas with regards to his/her responsibility to research participants: consent, transparency, right to withdraw, incentives, potential harm, privacy and disclosure (BERA, 2018). In my opinion, there were two key ethical considerations that needed sensitive handling in this research project. The first was ensuring the wellbeing of the students and obtaining their consent for participating in the research. The second was ensuring that I was not 'advantaged' by my position as an officer of the Ministry in obtaining the necessary administrative clearances to proceed with the research and in gaining access to schools to collect data. In the following paragraphs, I detail the processes which I implemented to ensure that the research was conducted with sound ethical principles.

In research, it was important for the parties involved to fully understand the nature of the research, data collected and mode of collection in order to give informed consent to participate in the research. The necessary information on the research had to be provided so that informed consent could be given or not and there also had to be assurances of confidentiality of the students' responses. At the first instance, the overall approach to the data collection processes needed the approval of the research committee of UCL IOE. After that, administrative approval was also needed in Singapore both at the MOE and school levels. Screened by educators and research experts, these approvals provided additional checks to ensure that students were not put in a potential position of harm or disadvantage due

to the research procedures or nature of the data collected. Final consent was then obtained from the parents and students, who had the final say on whether to participate in the research.

In the process of obtaining clearance from the MOE Corporate Research Office (CRO) and the schools to conduct the data collection, I did not benefit from my position as a Ministry officer. My research proposal and request to access schools had to be vetted by CRO and I also had to seek permission to collect data from each individual school Principal, just like every other researcher who wished to conduct research in schools. During the period when I was collecting data, I was also on official study leave and hence not on official duties. As such, I identified myself as a PhD candidate from UCL IOE and all my communications were sent via the UCL email account, though I generically indicated that I was an MOE officer on study leave as a matter of being upfront in providing information about myself. MOE officers and teachers being on study leave was not an unusual occurrence as we were encouraged to upgrade ourselves through further studies, but I consciously avoided stating my MOE appointment so that the Principal could consider the merits of my request and the needs of the school without fear or favour. The fact that I was rejected by a number of the schools I approached further attests to my not benefiting from my station.

Clearance from MOE was firstly obtained successfully. I then wrote to a number of school principals to seek permission to conduct the research in their schools. While some of my requests were rejected (or simply ignored), I eventually managed to obtain permission to conduct the study in three primary and three secondary schools, the original number targeted. I then personally visited each school and met with the principal to introduce myself and explain the nature of my research, assuring them that all responses gathered would remain confidential. I then met with the nominated teacher to also explain the nature of the research and provide him/her with the consent forms to be issued to the relevant cohort of students, namely the primary five students for the primary schools and the secondary one students for the secondary schools (ref. Appendix 6 for a copy of the consent form).

In research involving young children, it is important to ensure that the consent of the child is obtained to participate in the research activities (see in general Bell, 2008; Fargas-Malet et al., 2010). As mentioned earlier, under the laws of Singapore, consent from children below the age of majority of 21 has to be obtained from their

parents. The consent form informed the parents of the nature of the research, its aims and the data collection processes and sought their written consent for their children to take part in the research. To that effect, a reply slip was included in the letter for the parent (in some cases where the student's parents were not in Singapore, the guardian) to clearly indicate his or her explicit consent for the student to participate in all the different parts of the research, namely the quantitative questionnaire, focus group and video observation. The consent forms were brought home by the students to be completed by their parents and they were given around two weeks to make their decision on whether they wished to participate in all, part of, or decline to participate in the research altogether. It was also indicated in the consent form that information collected would remain confidential and used only for the purposes of the research. These processes ensured that parents and students were given adequate time to consider and make an informed choice on whether to consent to participate in the research and assured them of confidentiality.

In Singapore schools, when issued with a consent form for a school activity, the parents would discuss the nature of the activity with their children and decide if they wanted to participate in them. As such, the children's 'consent' was expressed through their parents who would initial on the form on their behalf. In conducting this research, to ensure that the consent was documented, only returned original reply slips that unequivocally indicated the parent's choice by deleting 'do not consent' or circling 'consent' were deemed as having given consent. The parents who wished to decline participation could indicate so through the consent form. Consent was also considered not given if returned slips did not indicate any choice. At all times, participation in the research was purely voluntary and while the form did not explicitly indicate, students were allowed to withdraw from any or all of the research activities that had been consented to.

As the quantitative data collection was carried out first, at the start of each session, I would introduce myself and brief the students on the nature of the research and its purpose. I would also ask if students wished to withdraw from the research and also informed that they could do so anytime, though none did. When students did not turn up, I considered them to have withdrawn from the research and no follow-up action was taken to collect data from them unless they themselves requested for it. On the few occasions when the students indicated their parents' consent without the form, their questionnaire was accepted conditionally; if the consent form did not arrive later, the questionnaire was discarded.

3.5 SUMMARY

In conclusion, a mixed method approach was determined as being the most appropriate both at the personal level as well as best meeting the needs of the exploratory nature of the research, the intent being to investigate flow from multiple angles in order to paint a more holistic picture of the students' experiences. Quantitative data was gathered via a questionnaire and analysed through factor analysis to determine if the primary and secondary school students experienced flow, and subsequently, to gain a macro perspective of the nature of their flow experiences. Qualitative data was collected via focus groups provided the nuancing of the students' flow experiences and triangulate with the quantitative findings. Video observations of music lessons provided a window into the Singapore music classroom to give an authentic insight into how flow was manifested in the lessons and provide further triangulation of the quantitative and focus group data. The data was compared both by primary and secondary school cohorts and also by prior music experience to examine if there were any differences in how the students experienced flow. Through the proposed approach, it is hoped that this research can make an original contribution to the understanding of the flow phenomenon as experienced by primary and secondary school students in Singapore in the school music classroom context.

CHAPTER 4 – QUANTITATIVE DATA ANALYSIS

4.1 QUANTITATIVE DATA FINDINGS

This chapter sets out the following quantitative findings of the research study: (a) comparisons of the flow measurements for the combined primary and secondary schools sample by flow dimension and further broken down by prior music experience; (b) comparisons of flow measurements for primary schools by flow dimension, prior music experience; (c) comparisons of flow measurements for secondary schools presented in a similar manner as set out in (b) above; (d) comparisons of the flow measurements between primary schools and secondary schools by the sample as a whole, and prior music experience.

4.2 MEASUREMENTS OF FLOW FOR COMBINED PRIMARY AND SECONDARY SCHOOLS COHORT

Based on the collated data based on the students' responses to the 35-item flow instrument using a 5-point Likert scale, the overall mean flow scores and the scores for each flow dimension for the primary and secondary school students based on the combined sample size of 410 are set out (Table 4.1), with the rank for each dimension indicated:

Table 4.1: Overall mean flow scores and mean scores for each flow dimension

	N	Mean	Rank	Std. Deviation
Overall mean score for flow	364	3.67	-	.67
Challenge-skill balance	405	3.62	5	.74
Clear goals	401	3.70	3	.74
Unambiguous feedback	401	3.48	8	.81
Autotelic experience	405	4.03	1	.87
Concentration	407	3.58	6	.78
Time transformation	406	3.88	2	1.04
Action-awareness merging	403	3.34	9	.92
Sense of control	408	3.64	4	.83
Loss of self-consciousness	401	3.51	7	.87

From Table 4.1, it can be noted that the two highest ranked and lowest ranked of the flow dimensions by mean score of time transformation, action-awareness merging

and autotelic experience (tied with loss of self-consciousness) had the highest standard deviation values in that order. This would appear to suggest that the students' experiences in these three dimensions had greater variance compared to the others, possibly explained by there being more outliers among the students who gave very high and very low scores in those two dimensions.

4.2.1 COMPARISONS BY PRIOR MUSIC EXPERIENCE

In this research study, students were considered to have prior music experience if they were current or former members of music CCAs in their schools or were involved in musical activities that took place on a regular basis outside of school, such as private music lessons. The flow scores for students without prior music experience (N = 234 or 57.1% of the sample) were set out in Table 4.2:

Table 4.2: Overall mean flow scores of students without prior music experience

	N	Mean	Std. Deviation
Overall mean score for flow	203	3.63	.63
Challenge-skill balance	230	3.52	.72
Clear goals	228	3.64	.73
Unambiguous feedback	229	3.42	.81
Autotelic experience	230	4.00	.85
Concentration	232	3.55	.71
Time transformation	232	3.86	.95
Action-awareness merging	229	3.30	.87
Sense of control	233	3.59	.79
Loss of self-consciousness	228	3.54	.79

For students with prior music experience (N = 176 or 42.9% of the sample), their flow measurements were in Table 4.3:

Table 4.3: Overall mean flow scores of students with prior music experience

	N	Mean	Std. Deviation
Overall mean score for flow	161	3.72	.71
Challenge-skill balance	175	3.76	.75
Clear goals	173	3.78	.74
Unambiguous feedback	172	3.56	.81
Autotelic experience	175	4.06	.91
Concentration	175	3.62	.86
Time transformation	174	3.92	1.15
Action-awareness merging	174	3.40	.98
Sense of control	175	3.71	.89
Loss of self-consciousness	173	3.48	.96

Table 4.4 compared the flow scores of students without and with prior music experience, with the similarities in rank shaded:

Table 4.4: Comparison of flow dimension scores for students without and with prior music experience

	Without prior music experience		With prior music experience	
	Mean	Rank	Mean	Rank
Challenge-skill balance	3.52	7	3.76	4
Clear goals	3.64	3	3.78	3
Unambiguous feedback	3.42	8	3.56	7
Autotelic experience	4.00	1	4.06	1
Concentration	3.55	5	3.62	6
Time transformation	3.86	2	3.92	2
Action-awareness merging	3.30	9	3.40	9
Sense of control	3.59	4	3.71	5
Loss of self-consciousness	3.54	6	3.48	8

Four of the nine dimensions were similarly ranked for both groups of students: autotelic experience (1st), time transformation(2nd), clear goals (3rd) and action-awareness merging (9th). It could be argued that in terms of the overall flow experience, there were some similarities in that these same four dimensions shared

the same levels of prominence for both the students without and with prior music experience.

Examining the flow scores, the students with prior music experience had a higher overall mean flow score (3.72) compared to those without prior music experience (3.63), with a difference of .09. The students with prior music experience also scored higher in eight of the nine dimensions, being challenge-skill balance (3.76 vs 3.52, difference = .24), clear goals (3.78 vs 3.64, difference = .14), unambiguous feedback (3.56 vs 3.42, difference = .14), autotelic experience (4.06 vs 4.00, difference = .06), concentration (3.62 vs 3.55, difference = .07), time transformation (3.92 vs 3.86, difference = .06), action-awareness merging (3.40 vs 3.30, difference = .10) and sense of control (3.71 vs 3.59, difference = .12). Students without prior music experience scored higher for loss of self-consciousness (3.54 vs 3.48, difference = .06). T-test comparisons of the mean scores were set out in Table 4.5:

Table 4.5: t-test comparisons of mean scores of overall samples of students without and with prior music experience

	t	df	Sig (2-talied)	Cohen's d
Overall mean score	-1.24	362	.22	.13
Challenge-skill balance mean	-3.30	403	.00	.33
Clear goals mean	-1.80	399	.07	.19
Unambiguous feedback mean	-1.71	399	.09	.17
Autotelic experience mean	-.74	403	.74	.07
Concentration mean	-.97	355.19	.34	.09
Time transformation mean	-.58	331.18	.56	.06
Action-awareness merging mean	-1.08	401	.28	.11
Sense of control mean	-1.42	406	.16	.14
Loss of self-consciousness mean	.71	328.98	.48	.07

The t-test results suggested that other than for challenge-skill balance, the differences of mean scores in the other flow dimensions were not significant at the 95% confidence interval, while the Cohen's d value for challenge-skill balance would also appear to suggest that the effect size of the difference was small. With the students with prior music experience having the higher overall mean score and also

scoring higher in eight of nine flow dimensions, it could be said that they enjoyed more positive flow experiences compared to the students without music experience, though the differences were not shown to be large. In terms of the range of the mean scores by flow dimension, the variation for the students without prior music experience was wider (3.30 to 4.00, range of .70) compared to that for the students with prior music experience (3.48 to 4.06, range of .58), with a difference of .12. The wider range of scores for the students without music knowledge would appear to suggest that the flow dimensions had a more varied contribution to their overall flow experiences. With a narrower range of scores, the flow experiences of the students with music experience would appear to be more consistent across the nine dimensions.

4.3 FLOW MEASUREMENTS FOR PRIMARY SCHOOLS

The overall mean flow scores and scores for each flow dimension for the primary schools are set out in Table 4.6:

Table 4.6: Primary schools mean flow scores and mean scores for each flow dimension

	N	Mean	Std. Deviation
Overall mean score for flow	270	3.70	.67
Challenge-skill balance	306	3.65	.73
Clear goals	303	3.71	.75
Unambiguous feedback	303	3.46	.83
Autotelic experience	306	4.05	.89
Concentration	308	3.62	.77
Time transformation	306	3.92	1.06
Action-awareness merging	303	3.38	.92
Sense of control	308	3.67	.84
Loss of self-consciousness	301	3.53	.87

The order for the mean scores for the nine flow dimensions was as follows: 1st = autotelic experience (4.05), 2nd = time transformation (3.92), 3rd = clear goals (3.71), 4th = sense of control (3.67), 5th = challenge-skill balance (3.65), 6th = concentration (3.62), 7th = loss of self-consciousness (3.53), 8th = unambiguous feedback (3.46), 9th = action-awareness merging (3.38). While the scores for autotelic experience and

time transformation were the highest, it was worth noting that their respective standard deviations (.89 and 1.06) were also high relative to the other dimensions. This would appear to suggest that in spite of the high mean score, there were outliers among students who did not find either dimension prominent in their flow experiences. The standard deviation for the lowest-ranked dimension of action-awareness merging was also high at .92, suggesting that the students' experience of this dimension varied widely.

4.3.1 COMPARISONS BY PRIOR MUSIC EXPERIENCE

The flow scores for primary school students without and with prior music experience are shown in Tables 4.7 and 4.8 respectively:

Table 4.7: Mean flow scores for primary school students without prior music experience

	N	Mean	Std. Deviation
Overall mean score for flow	151	3.67	.63
Challenge-skill balance	175	3.55	.70
Clear goals	172	3.64	.75
Unambiguous feedback	174	3.42	.82
Autotelic experience	175	4.04	.87
Concentration	177	3.60	.69
Time transformation	176	3.92	.95
Action-awareness merging	173	3.34	.86
Sense of control	177	3.62	.79
Loss of self-consciousness	172	3.57	.81

Table 4.8: Mean flow scores of primary school students with prior music experience

	N	Mean	Std. Deviation
Overall mean score for flow	119	3.73	.72
Challenge-skill balance	131	3.80	.75
Clear goals	131	3.81	.76
Unambiguous feedback	129	3.52	.85
Autotelic experience	131	4.07	.92
Concentration	131	3.65	.86
Time transformation	130	3.92	1.19
Action-awareness merging	130	3.45	.98
Sense of control	131	3.75	.90
Loss of self-consciousness	129	3.49	.95

The flow scores for the primary school students with and without prior music experience are next compared in Table 4.9, with the similarities in rank shaded:

Table 4.9: Comparison of flow dimension scores for primary school students without and with prior music experience

	Without prior music experience		With prior music experience	
	Mean	Rank	Mean	Rank
Challenge-skill balance	3.55	7	3.80	4
Clear goals	3.64	3	3.81	3
Unambiguous feedback	3.42	8	3.52	7
Autotelic experience	4.04	1	4.07	1
Concentration	3.60	5	3.65	6
Time transformation	3.92	2	3.92	2
Action-awareness merging	3.34	9	3.45	9
Sense of control	3.62	4	3.75	5
Loss of self-consciousness	3.57	6	3.49	8

Comparing their mean scores, the primary school students with and without prior music experience had similar ranks for four of the flow dimensions: autotelic experience (1st), time transformation (2nd), clear goals (3rd) and action-awareness merging (9th). These same dimensions were also ranked similarly in the overall

sample for students with and without music experience as shown in Table 4.4. As such, it could be inferred that the flow experiences of the primary school students with and without music experience were similar to the overall sample in terms of the three most prominent flow dimensions (autotelic experience, time transformation and clear goals) and also the least prominent (action-awareness merging).

The students with prior music experience scored higher in the overall mean flow score (3.73 vs 3.67, diff. = .06) and also in seven of the flow dimensions compared to those without prior music experience (challenge-skill balance: 3.80 vs 3.55, diff. = .25; clear goals: 3.81 vs 3.64, diff. = .17; unambiguous feedback: 3.52 vs 3.42; diff. = .10; autotelic experience: 4.07 vs 4.04, diff. = .03; concentration: 3.65 vs 3.60, diff. = .05; action-awareness merging: 3.45 vs 3.34; diff. = .11; sense of control: 3.75 vs 3.62, diff. = .13). They scored lower in the dimension of loss of self-consciousness (3.49 vs 3.57, diff. = -.08) while the scores for time transformation were similar (3.92).

The t-test comparisons of these two groups of students are set out in Table 4.10:

Table 4.10: t-test comparisons of mean scores of primary school students without and with prior music experience

	t	df	Sig (2-talied)	Cohen's d
Overall mean score	-.78	268	.44	.09
Challenge-skill balance mean	-3.03	304	.00	.34
Clear goals mean	-1.87	301	.06	.23
Unambiguous feedback mean	-1.08	301	.28	.12
Autotelic experience mean	-.21	304	.84	.03
Concentration mean	-.47	244.30	.64	.06
Time transformation mean	-.02	241.09	.98	0
Action-awareness merging mean	-1.04	301	.30	.12
Sense of control mean	-1.28	306	.20	.15
Loss of self-consciousness mean	.76	299	.45	.09

The t-tests revealed that the differences between the mean scores were significant for the dimension of challenge-skill balance at the 95% confidence interval, and the Cohen's d value was .36, meaning that the effect size was not large. This would

seem to suggest that in spite of the higher scores of students with prior music experience in most flow dimensions, the difference in the quality of the flow experiences compared to the students without music experience was not large. This would be consistent with the earlier reported finding at Table 4.5 for the students without and with prior music experience in the overall sample. However, the students without prior music had a wider range of differences in score by flow dimension (3.34 to 4.04, difference = .70) compared to those with prior music experience (3.45 to 4.07, difference = .62), with a difference of .08. These findings were consistent with those made for the combined sample, where the students without prior music experience were also found to have a wider range of mean flow dimension scores by .12 compared to the students with prior music experience. From these findings, the primary school students with music knowledge could be said to have had more positive flow experiences in which the nine dimensions contributed more evenly to the overall experience compared to the students without music knowledge.

4.4 FLOW MEASUREMENTS FOR SECONDARY SCHOOLS

The mean flow score and scores for each flow dimension for the secondary schools (N = 100) are set out in Table 4.11:

Table 4.11: Secondary schools mean flow score and scores for each flow dimension

	N	Mean	Std. Deviation
Overall mean score for flow	94	3.59	.66
Challenge-skill balance	99	3.52	.78
Clear goals	98	3.66	.68
Unambiguous feedback	98	3.54	.74
Autotelic experience	99	3.94	.82
Concentration	99	3.44	.80
Time transformation	100	3.77	.97
Action-awareness merging	100	3.22	.93
Sense of Control	100	3.55	.81
Loss of self-consciousness	100	3.44	.87

The order for the mean scores for the nine flow dimensions was as follows: 1st = autotelic experience (3.94), 2nd = time transformation (3.77), 3rd = clear goals (3.66),

4th = sense of control (3.55), 5th = unambiguous feedback (3.54), 6th = challenge-skill balance (3.52), 7th = a tie between concentration and loss of self-consciousness (3.44), 9th = action-awareness merging (3.22). Compared to the primary school students (Table 5.10), the range of the standard deviation for the flow dimensions was somewhat lower (.68-.97 vs .73-1.06), though the dimensions with the highest standard deviation were similar here and also in the same order: time transformation, action-awareness merging and autotelic experience. The same conclusions could be reached, namely that the students' experiences of the two most prominent and also the least prominent flow dimensions showed the widest range.

4.4.1 COMPARISONS BY MUSIC EXPERIENCE

The secondary school students without (N = 56) and with prior music experience (N = 44) obtained scores set out in Tables 4.12 and 4.13 respectively:

Table 4.12: Mean flow scores for secondary school students without music experience

	N	Mean	Std. Deviation
Overall mean score for flow	52	3.52	.63
Challenge-skill balance	55	3.42	.80
Clear goals	56	3.65	.68
Unambiguous feedback	55	3.44	.78
Autotelic experience	55	3.85	.79
Concentration	55	3.36	.75
Time transformation	56	3.66	.92
Action-awareness merging	56	3.19	.90
Sense of Control	56	3.50	.78
Loss of self-consciousness	56	3.45	.76

Table 4.13: Mean flow scores for secondary school students with prior music experience

	N	Mean	Std. Deviation
Overall mean score for flow	42	3.68	.68
Challenge-skill balance	44	3.64	.74
Clear goals	42	3.69	.69
Unambiguous feedback	43	3.68	.68
Autotelic experience	44	4.06	.86
Concentration	44	3.55	.86

Time transformation	44	3.91	1.03
Action-awareness merging	44	3.26	.97
Sense of Control	44	3.61	.85
Loss of self-consciousness	44	3.43	1.01

Table 4.14 compared the mean flow scores for students with and without prior music experience with the similarities highlighted:

Table 4.14: Comparison of flow dimension scores for secondary school students without and with prior music experience

	Without prior music experience		With prior music experience	
	Mean	Rank	Mean	Rank
Challenge-skill balance	3.42	7	3.64	5
Clear goals	3.65	3	3.69	3
Unambiguous feedback	3.44	6	3.68	4
Autotelic experience	3.85	1	4.06	1
Concentration	3.36	8	3.55	7
Time transformation	3.66	2	3.91	2
Action-awareness merging	3.19	9	3.26	9
Sense of control	3.50	4	3.61	6
Loss of self-consciousness	3.45	5	3.43	8

The students without and with prior music experience shared similar ranks in four of the flow dimensions: autotelic experience (1st), time transformation (2nd), clear goals (3rd) and action-awareness merging (9th). These four dimensions were also similarly ranked for the overall (Table 5.8) and primary school (Table 5.18) samples comparing students without and with music experience. This would appear to suggest that in the overall flow experience for students without and with music experience in both primary and secondary schools, the dimensions of autotelic experience, time transformation and clear goals were similarly prominent, while the action-awareness was least prominent.

Table 4.15 set out the t-test comparisons of the mean scores for secondary school students without and with prior music experience:

Table 4.15: t-test comparisons of mean scores of secondary school students without and with prior music experience

	t	df	Sig (2-talied)	Cohen's d
Overall mean score	-1.15	92	.25	.24
Challenge-skill balance mean	-1.43	97	.16	.29
Clear goals mean	-.29	96	.77	.06
Unambiguous feedback mean	-1.63	96	.11	.33
Autotelic experience mean	-1.22	97	.23	.25
Concentration mean	-1.19	97	.24	.24
Time transformation mean	-1.28	98	.21	.26
Action-awareness merging mean	-.39	98	.70	.07
Sense of control mean	-.65	98	.52	.13
Loss of self-consciousness mean	.12	98	.91	.02

The students with prior music experience scored higher in the overall mean score (3.68 vs 3.52, difference = .16) and also in eight of the flow dimensions (challenge-skill balance: 3.64 vs 3.42, difference = .20; clear goals: 3.69 vs 3.65, difference = .04; unambiguous feedback: 3.68 vs 3.44; autotelic experience: 4.06 vs 3.85, difference =.21; concentration: 3.55 vs 3.36, difference = .19; time transformation: 3.91 vs 3.66, difference = .25; action-awareness merging: 3.26 vs 3.19, difference = .05; sense of control: 3.61 vs 3.50, difference = .11), scoring lower for loss of self-consciousness (3.43 vs 3.45, difference = -.02). The t-test comparisons showed that none of the difference in mean scores between the students without and with prior music experience were significant at the 95% confidence interval, which would suggest that any difference between the flow experiences of these two groups of students was not significant.

These findings would appear to corroborate the earlier findings made for the overall and primary school samples, that the students with prior music knowledge had a somewhat more positive flow experience, though this difference may not be large. In terms of the range of the flow dimension scores, the students with prior music experience had a wider range of scores (3.26 to 4.06, difference = .80) compared to those without music experience (3.19 to 3.85, difference = .66), with a difference of .14. This was in contrast to the findings made for the overall and

primary school samples, both of which showed the students without music experience having a wider range of scores.

4.5 PRIMARY AND SECONDARY SCHOOL FLOW MEASUREMENTS COMPARED

4.5.1 COMPARISONS OF OVERALL PRIMARY SCHOOL AND SECONDARY SCHOOL SAMPLES

Comparing and ranking the mean scores for each flow dimension for the primary and secondary schools yielded the following outcome set out in Table 4.16, with the dimensions similar in rank highlighted:

Table 4.16: Comparison of overall flow scores for primary and secondary schools

	Primary school		Secondary school	
	Mean	Rank	Mean	Rank
Challenge-skill balance	3.65	5	3.52	6
Clear goals	3.71	3	3.66	3
Unambiguous feedback	3.46	8	3.54	5
Autotelic experience	4.05	1	3.94	1
Concentration	3.62	6	3.44	8
Time transformation	3.92	2	3.77	2
Action-awareness merging	3.38	9	3.22	9
Sense of control	3.67	4	3.55	4
Loss of self-consciousness	3.53	7	3.44	7

Based on their respective mean scores, six of the nine flow dimensions, namely autotelic experience (ranked 1st), time transformation (2nd), clear goals (3rd), sense of control (4th), loss of self-consciousness (7th), and action-awareness merging (9th), had the same rank for both the primary and secondary school students in their flow experiences. This would appear to suggest that the primary and secondary school students shared considerable similarities in terms of which flow dimensions were prominent in their flow experiences.

In terms of the mean scores, the primary school overall mean score was higher than that for the secondary school (3.70 vs 3.59, difference = .11) and also had higher mean scores for all the flow dimensions (challenge-skill balance: 3.65 vs 3.52, difference = .13; clear goals: 3.71 vs 3.66, difference = .05; autotelic

experience: 4.05 vs 3.94, difference = .11; concentration: 3.62 vs 3.44 difference = .18; time transformation: 3.92 vs 3.77, difference = .15; action-awareness merging: 3.38 vs 3.22, difference = .16; sense of control: 3.67 vs 3.55, difference = .12; loss of self-consciousness: 3.53 vs 3.44, difference = .08), except for unambiguous feedback (3.46 vs 3.54, difference = -.08). The range of the mean scores by flow dimension for the secondary school students (3.22 to 3.94, difference = .72) was also noted to be wider when compared to that for the primary school students (3.38 to 4.05, difference = .67), with a difference of .05.

Table 4.17 set out the t-test comparisons of the mean scores between the primary and secondary school students (refer to Tables 4.6 and 4.11):

Table 4.17: t-test comparisons of mean scores of primary and secondary school students

	t	df	Sig (2-talied)	Cohen's d
Overall mean score	1.33	362	.19	.17
Challenge-skill balance mean	1.58	403	.11	.17
Clear goals mean	.59	399	.55	.07
Unambiguous feedback mean	-.85	399	.40	.10
Autotelic experience mean	1.08	403	.28	.11
Concentration mean	2.01	405	.05	.23
Time transformation mean	1.27	404	.21	.11
Action-awareness merging mean	1.53	401	.13	13
Sense of control mean	1.33	406	.18	.21
Loss of self-consciousness mean	.91	399	.36	.08

The t-test results showed that only the difference in mean scores of the primary and secondary school students was significant at the 95% confidence interval for the dimension of concentration. The Cohen's d value of .23 would appear to suggest however, that the effect size was small. Based on the preceding observations, it may therefore be noted that the primary school students enjoyed more positive flow experiences and also that the different dimensions contributed more evenly to their overall flow experience when compared to the secondary school students.

4.5.2 COMPARISONS BY PRIOR MUSIC EXPERIENCE

The next table 4.18 compares the flow scores of primary and secondary school students without prior music experience:

Table 4.18: Comparisons of flow scores of primary and secondary school students without prior music experience

	Primary school		Secondary school	
	Mean	Rank	Mean	Rank
Challenge-skill balance	3.55	7	3.42	7
Clear goals	3.64	3	3.65	3
Unambiguous feedback	3.42	8	3.44	6
Autotelic experience	4.04	1	3.85	1
Concentration	3.60	5	3.36	8
Time transformation	3.92	2	3.66	2
Action-awareness merging	3.34	9	3.19	9
Sense of control	3.62	4	3.50	4
Loss of self-consciousness	3.57	6	3.45	5

Scores for six of the flow dimensions for the primary and secondary school students without prior music experience shared the same rank: autotelic experience (ranked 1st), time transformation (2nd), clear goals (3rd), sense of control (4th), challenge-skill balance (7th) and action-awareness merging (9th). The primary school students without prior music experience had a higher overall flow score (3.67 vs 3.52, difference = .15) and also had higher scores in seven of the dimensions (challenge-skill balance: 3.55 vs 3.42, difference = .13; autotelic experience: 4.04 vs 3.85, difference = .19; concentration: 3.60 vs 3.36, difference = .24; time transformation: 3.92 vs 3.66, difference = .26; action-awareness merging: 3.34 vs 3.19, difference = .15; sense of control: 3.62 vs 3.50, difference = .12; loss of self-consciousness: 3.57 vs 3.45, difference = .12), scoring lower for the dimensions of clear goals (3.64 vs 3.65, difference = -.01) and unambiguous feedback (3.42 vs 3.44, difference = -.02). The primary school students without prior music experience (3.34 to 4.04, range = .70) also had a wider range of scores by flow dimension compared to the secondary school students (3.19 to 3.85, range = .66), with a difference of .04. It could therefore be said that the primary school students without prior music experience overall had

more positive flow experiences but the flow dimensions contributed less evenly to the flow experience when compared to the secondary school students.

The flow scores of the primary and secondary school students with prior music experience are compared in the following table 4.19:

Table 4.19: Comparisons of flow scores of primary and secondary school students with prior music experience

	Primary school		Secondary school	
	Mean	Rank	Mean	Rank
Challenge-skill balance	3.80	4	3.64	5
Clear goals	3.81	3	3.69	3
Unambiguous feedback	3.52	7	3.68	4
Autotelic experience	4.07	1	4.06	1
Concentration	3.65	6	3.55	7
Time transformation	3.92	2	3.91	2
Action-awareness merging	3.45	9	3.26	9
Sense of control	3.75	5	3.61	6
Loss of self-consciousness	3.49	8	3.43	8

The primary and secondary school students with prior music experience scored the same rank for the flow dimensions of autotelic experience (1st), time transformation (2nd), clear goals (3rd), loss of self-consciousness (8th) and action-awareness merging (9th) and different rank for challenge-skill balance (4th vs 5th for the primary and secondary school students respectively), unambiguous feedback (7th vs 4th), concentration (6th vs 7th) and sense of control (5th vs 6th). When referenced with the earlier observations made for students without prior music experience (Table 4.18), there were four flow dimensions in both comparisons that had similar ranking, namely autotelic experience (1st), time transformation (2nd), clear goals (3rd) and action-awareness merging (9th), it could be said that the students with and without prior music experience shared certain similarities in their flow experiences in terms of the three most prominent flow dimensions as well as the least prominent. In addition, given that the students without and with prior music experience shared six and five similarities in the rank of the flow dimension mean scores respectively, it could be argued that the primary and secondary school students in both groups shared considerable similarities in their flow experiences.

The primary school students had the higher overall flow score compared with the secondary school students (3.73 vs 3.68, difference = .06) and also had higher mean scores in eight of the dimensions (challenge-skill balance: 3.80 vs 3.64, difference = .16; clear goals: 3.81 vs 3.69, difference = .12; autotelic experience 4.07 vs 4.06, difference = .01; concentration: 3.65 vs 3.55, difference = .10; time transformation: 3.92 vs 3.91, difference = .01; action-awareness merging: 3.45 vs 3.26, difference = .19; sense of control: 3.75 vs 3.61, difference = .14; loss of self-consciousness: 3.49 vs 3.43, difference = .06), while having a lower mean score for unambiguous feedback (3.52 vs 3.68, difference = -.16). For the primary school students with prior music experience, the range of the flow dimension scores was also narrower (3.45 to 4.07, range = .62) compared to the scores for the secondary school students (3.26 to 4.06, range = .80), with a difference of -.18. It may therefore be possible to conclude that the primary school students with prior music experience had more positive flow experiences in which the flow dimensions made more even contributions to the overall experience when compared to the secondary school students.

CHAPTER 5 – ANALYSIS OF FOCUS GROUP DATA PART 1 – PRIMARY SCHOOLS

5.1 GENERAL THEMATIC ANALYSIS

Analysing the data collected from the six primary school focus groups in the manner set out in the Methodology section, the following key themes emerged vis-à-vis the students' experiences in the music classroom:

(a) Enjoyment

(b) Transformative nature

(c) Motivation

(d) Relaxation

(e) Collaboration

(f) Teachers

As noted in the Methodology section, the students' quotations are reproduced in verbatim in a form of localised English, or 'Singlish', with grammar and mistakes unedited to retain its authenticity.

5.1.1 ENJOYMENT

When asked about their feelings and experiences in music classes, the students' responses from across all six focus groups from both the CCA and non-CCA students were largely positive.

> *"Yes, I look forward for music lesson. I feel it is very interesting and fun when people gather around and talk about music." [PS1, non-CCA].*
>
> *"Music [lesson] is fun to come to as you can laugh at some awkward things with your friends and then learn new things about music and still have fun with friends and music." [PS2, CCA]*
>
> *"I like music lessons as normally, during school lessons they could be boring, but during music lesson it could be fun to me as I can do some music." [PS3, CCA]*
>
> *"I think it's [music lesson] fun also because after you learn from the teacher right, then you can, sometimes you can play the instrument yourself and try a new thing." [PS3, non-CCA]*

The prevalent impression appeared to be one of fun and students enjoying their lessons, 'fun' being a word that was commonly used to describe their experiences. A key aspect of the enjoyment seemed to stem from the fact that music was an 'activity' that allowed them to move around and do something appeared to be a reason for some students preferring music lessons over what they perceived as more passive teacher-led approach academic classes.

"You feel very lively because you just to have to like… you can stand up instead of sitting down and just listening to the teacher, you can move around then, or sit or anything you want." [PS1, CCA]

"Because the teacher [for academic subjects] will talk… then when you ask then she will like, repeat again. After that you don't get it. When you go to music, at least you have some movement and action." [PS3, CCA]

"For normal lessons, the teacher is just keep talking about like, all those concepts and all those things. But for music lesson we get to try our hand on those musical instruments." [PS3, CCA]

The enjoyable experiences also appeared to have had an impact on students' perception of time, mostly in the form of music lessons appearing to pass and hence end very quickly.

"When we were playing an instrument I was very interested to get, I didn't know that time pass so fast." [PS1, non-CCA]

"Or like, in the middle of the playing the bell [which signals the end of the class] suddenly ring. Like, eh it's over and you are enjoying it… then you feel like, 'why is it so short?'" [PS1, CCA]

"Yes, because I like music of all the subjects and kind of fun, kind of pass faster." [PS3, non-CCA]

"I feel the music lesson pass quickly is because when we enjoy something, we will feel like, time flies." [PS3, CCA]

However, it should also be noted that music lessons were not long in reality, most lasting only 30 minutes under the Singapore music curriculum recommended guidelines for primary five students. This was exacerbated by the fact that music lessons were usually held in a music room rather than their own classrooms, so part of that time was spent getting there, as indicated in the students' responses to the question of whether they felt their music lessons passed quickly or slowly.

"Very quickly. 'Cause only got one period [30 minutes]."

"It take quite a long time to go down [to the music room]. Like, 10 minutes just to go down." [both PS3, non-CCA]

Students did articulate their wish that music lessons should be longer, presumably so that they could have more enjoyable experiences.

"Yes, [music lessons ended] very quickly. They should make it [music lessons] two hours." [PS2, non-CCA]

5.1.2 TRANSFORMATIVE NATURE

The positive experiences of students were not confined to good feelings and enthusiasm for music; for some, their musical experiences appeared to have a transformative effect. For example, some had expressed that through musical

activities, they had experienced personal growth beyond musical learning, developing qualities such as perseverance, courage and tolerance:

> *"It help me become more courageous because before music lesson, I used to be very scared to perform anything. But music lesson forced me to like, perform in front of others." [PS3, non-CCA]*

> *"When playing the song we learn in our CCA, sometimes I feel more patient because we need to keep practicing in order to get it well." [PS3, CCA]*

While these qualities are non-musical in nature, they were acquired organically in the process of making music and are transferable and will stand the students in good stead in their lives.

> *"I think it [music] made me a better person also. Because, right, after learning music, feel like I won't give up so easily and like, when I reach for like, other subjects, those academic one, then I'll think right, of what I'll do in music…" [PS3, non-CCA]*

Some shared the view that music was empowering in that it allowed them to express and be themselves, as well as show off their creativity.

> *"Because when we are in music class we don't see the time; we see how much fun we have. Our teacher is like, sing songs and then we ourselves will sing and then in between we joke around. I think music class is the only time when we have some freedom." [PS2, non-CCA]*

> *"For music we can have our own opinions." [PS3, non-CCA]*

> *"…when we are creating songs you can use a lot of ways, not just one way and you can express your creativeness [sic] in it." [PS3, non-CCA]*

Others expressed that music had a generally positive effect on them.

> *"I feel very relaxed and happy because when I listen to music, it's like I don't care about anything else and it makes me, whatever mood I am, it makes me happier. [PS3, non-CCA]*

5.1.3 MOTIVATION

Students generally manifested some motivation not just to want to learn music, but also to put in effort to do so, simply because they liked or enjoyed making music. When they succeeded in accomplishing the musical task, they expressed a sense of satisfaction that quite likely encouraged them to want to continue putting in effort.

> *"The music is out there motivates me to attend music lessons and actually put effort in it. 'Cause I am like, listening to music so when I am like, in music classes I am motivated by myself to like, just be singing. [PS2, non-CCA]*

> *"It's [music] is enjoyable and like, usually when you learn and master a new piece of song you will feel like you have achieved something. [PS2, CCA]*

At times, the motivation simply came from listening to music and being inspired to want to be able to play it.

> *"Listening to music, and then it's like, I wonder, how do they make it so good? So I think about it and I feel motivated, I feel determined to learn music." [PS2, non-CCA]*

From the students' comments, it seemed that their motivation was uninfluenced by external factors and therefore more likely to be intrinsic in nature.

A possible reason for the motivation could be that the students found the learning activities to be within their capabilities and also more interesting compared to the academic subjects. Being able to complete the activities fueled the students' self-belief and confidence, thereby making them more willing to try new musical activities. But even when facing challenges, students' intrinsic motivation spurred them to persevere as they felt the end result of being able to make music on their own was worthwhile.

> *"I find the recorder quite nice, even though it's quite hard to blow, I think… to make a sound. But then after you learn how to make a sound and then you try for a long time, you can make nice songs and the tune of the recorder is very nice, in my opinion." [PS3, non-CCA]*
>
> *"It's just… want to learn [music] though it's very tiring. Even though it's tiring sometimes, I just want to continue. You don't want to stop." [PS1, CCA]*

As such, the making of music became an end in itself for the students.

But the learning of music did not come without challenges. The students freely admitted that they found the learning of musical instruments to be challenging, even those from music CCAs.

> *"We learned to play the recorder and then we learnt how to play, like different songs with the recorder. Some of us don't know how to play. We were really… some of them were really struggling but then after… after a while they got to know how to play what… how to play songs on the recorder." [PS1, CCA]*
>
> *"I find that it is a bit hard because now we are learning guitar and my fingers are too short and I can't like, put it at the right string properly." [PS3, non-CCA]*

In particular, students found the mastery of the instrumental playing techniques challenging, as reflected in the following passages from different students:

> *"Learning how to play the recorder was quite hard. Like trying to pitch the notes."*
>
> *Get the correct fingerings. Like, you need to get the correct fingerings to like, get the correct notes."*
>
> *And you need to press harder to make sure it doesn't… squeak or anything."*
>
> *The xylophone [was challenging to learn]. Because… you shouldn't like, bang it very hard because the thing [mallet]… You have to, like hold it properly*

because like, when you hit it very hard it will, like break and then you have to see which tone is correct because like, you cannot play a song anyhow." [all PS1, CCA]

"Only for some parts of the guitar lesson where we have to press the notes, I find it quite hard for me because… we need to press the strings really hard in order to have the nice tune and our hands will always get very reddish after that and very painful." [PS3, CCA]

In spite of this, their motivation to learn to play musical instruments appeared undiminished. If anything, students appeared to be particularly motivated to learn and play musical instruments such as the recorder, guitar, ukulele or Orff instruments, which are commonly taught in the Singaporean music classroom. For example, when asked why they liked to learn music, a student replied, "*…so we can learn how to play instruments."* [PS1, CCA]. When queried on why they looked forward to music classes, students appeared to suggest that the thought of learning something new appealed to them:

"…we can explore, like new instruments, and how we can play them." [PS1, CCA].

"Learn new musical instruments that most people don't really know, something like the bells which gives out some different kind of sounds." [PS1, non-CCA].

"Fun. I get to play instruments that I never played before and I find it very interesting." [PS3, non-CCA]

There were also students who said that playing certain instruments projected an attractive image, which would suggest that some extrinsic motivation may also be at play.

"I like my music lessons especially currently because we are learning about guitar now and I… like to play guitar because I have never tried before, and when I see other people playing, they look very cool." [PS3, CCA]

Nevertheless, the overwhelming sense was that the students were intrinsically motivated to want to learn to play musical instruments.

5.1.4 RELAXATION

Next to enjoyment, relaxation was another theme that frequently emerged in many different guises, with the word 'relax' or its derivatives appearing multiple times across the focus groups. At the base level, many students said that they felt relaxed when they listened to music as a matter of their everyday activities and helped them to relieve the stress of daily life.

"Relaxed. Because like when you so stressed out about exam you just put on the earphones or whatever and then you can just like relax on the song. Because, like it keeps your mind away from the stressful things." [PS1, CCA]

Strongly linked but in opposition to the theme of relaxation was the stress students felt in school due to the pressure to do well in the academics, which brought out another dimension of the relaxation theme. To help them cope with the stress of schooling, students often found sought solace in music.

> *"When we don't know how to do our sums in maths, we like, panic… Music, we can relax ourselves." [PS1, non-CCA]*
>
> *"If we are doing problem sums or we don't know, to calm us we can stop and do some… make some music." [PS1, non-CCA]*
>
> *"It's [music] like, also can relieve stress like, whenever we study… study a lot and then suddenly have music lesson, we relieve stress. Then after that, you come back you feel more refreshed and then it's like, you think that it helps you." [PS3, non-CCA]*

In particular, students pointed out that they liked to attend music classes because it helped them to relax, implying a belief that music classes were chiefly meant for relaxation:

> *"It relax us and reveals (sic) our stress. Like, so much work, then we listen to music." [PS1, non-CCA].*
>
> *"Like, it will remove my stress, like when I never do my homework I will panic a lot. When there's music lesson, I will forget it." [PS1, non-CCA].*
>
> *"It [music] helps in your studies. It helps to relax yourself. Relieves stress." [PS2, CCA]*

Thanks to the relaxing qualities of music, the students went on to elaborate their preference for music lessons over other academic classes. Students found academic subjects either stressful due to the need to take examinations or found the lessons uninteresting compared to the fun experienced in music classes. Part of the reason behind their preference could also be due to music being enjoyable and not being an examinable subject in Singapore and therefore less stressful.

> *"'…it's like just in school, you just have fun and it's not like, for exams, you don't get stressed." [PS2, non-CCA]*
>
> *"Other subjects are more stressful than music and art and all this because we can like, just do it freely and you don't have to like, stress out. You want to sing this note you just sing it, it doesn't matter if it's too high too low or you know… But other subjects you have to make sure you get perfect answer." [PS2, non-CCA]*
>
> *"I find it better than math, science, all these, as there are better way to buy time in school and I have more interest in them than academics." [PS3, non-CCA]*

However, some students also pointed out that they would still enjoy music lessons even if they were given graded assignments or had to take exams for it, mainly because they perceived music as being different from other academic subjects, its

mode of assessment and experience would also be different and somehow more enjoyable.

> *"And it doesn't really matter if our teacher give us assignment to like, sing the music or like, write a part of the music like, lyrics and notes or sound, you know. But since you are singing about anything, we can just sing freely, make the beats we want as long as it sounds good…" [PS2, non-CCA]*

> *"We feel even more happy [if music was examinable] because I don't have to like, study at home so seriously, like, what is this… like science, or maths, or mother tongue." [PS2, non-CCA]*

> *"I like to wish there was a music exam or something like that 'cause if there is a music exam, we can like, express ourselves more… Then it can be judged like, marks to our voice and how like, see how nervous we are or how competent we are." [PS2, non-CCA]*

From the above, it would appear that students approached music very differently from their academic subjects in that even in an exam setting, they perceived music as being fun or relaxing. While they made the distinction between academic subjects and music, they appeared to value music, both intrinsically and as something that could help them later in life:

> *"…I think studies are very important, but music also important." [PS1, non-CCA]*

> *"I think music can help you a lot when you grow up… just like subjects: English, maths. Yah it's like one of… your ability to do something." [PS1, non-CCA]*

Some students also appeared to appreciate music lessons as a platform where they could freely express themselves, as compared with the other academic subjects where the learning approach tended to be more didactic. One student expressed it as being able to "…*just develop our own ideas*." [PS3, CCA] Others put it this way:

> *"Because when we are in music class we don't see the time; we see how much fun we have. Our teacher is like, sing songs and then we ourselves will sing and then in between we joke around. I think music class is the only time when we have some freedom." [PS2, non-CCA]*

> *"For music we can have our own opinions, like if the teacher wants us to say our own ideas, we can say and then the teacher will be like, OK, and then combine together and stuff." [PS3, non-CCA]*

Ultimately, it seemed that students preferred music lessons over other academic subjects because they were more fun.

> *"Playing those music instruments, for me, is fun than our subjects." [PS3, CCA]*

5.1.5 COLLABORATION

There was altogether a general sense that for the students, music was something that brought them together.

> *"Yes, I look forward for music lesson. I feel it is very interesting and fun when people gather around and talk about music." [PS1, non-CCA].*

Students' were generally happy to share their music and make music together with their friends and family. For some, it was simply a joy to share or make music with others.

> *"I like to share music with my best friends and they will like to share songs with me so we get to know more songs." [PS2, non-CCA]*

Other than being a more enjoyable experience, a motivation behind their wanting to make music together was the potential for friends to give ideas to help improve their music through a sharing of musical ideas and opinions.

> *"It's better to do with your friends because everybody has different ideas. If you do it yourself, like, 'is this correct, is this wrong?', you have to try yourself. But you can ask your friends, 'is this correct, shall I put it this way?' They will tell you why it is not good this way and you can correct it." [PS2, non-CCA]*

> *"Because when you are with your friends, you feel happier and you won't feel alone practising by yourself and then your friends can also point out your mistakes." [PS3, CCA]*

There was also a sense that working together, students found it easier to understand the lesson or complete tasks.

> *"Researcher: But did you find that singing together with your friends you managed to overcome the challenge? Student: Yes." [PS1, non-CCA]*

While a strong element of collaboration was apparent when students spoke about their music-making experiences, they nevertheless articulated their belief that one's preference for music could be a highly personal matter.

> *"Because sometimes different people have like, different types of music. Maybe they like classical more than maybe jazz or something else…" [PS1, CCA]*

> *"Because there is music for each individual… there's a few music, different genres." [PS2, non-CCA]*

> *"I think I want to listen to music by myself because I want to make it more personal in such a way because… when my mood changes and when I react to something then I usually just burst it out so I just want to keep it in because I use music to do that." [PS3, CCA]*

In the conversations, the students reflected a wide choice of music, such as western pop, classical, Korean pop, Japanese pop etc. However, beyond appreciating different genres of music, they also valued music as a platform for expressing their individuality, one where they could be themselves without having to worry about

what others thought or 'judged' (though 'judged' in this case may be referring to some form of 'assessment').

> *"I think music can express our feeling, like sometime you feel so sad or so happy that you cannot use words to express, you use music." [PS1, non-CCA]*
>
> *"I can express my feelings… because there is music for each individual, there's a few music, different genres." [PS2, non-CCA]*
>
> *"I prefer to make music by myself because nobody will judge me." [PS2, non-CCA]*
>
> *"Because music and art are generally… they are not like the very judged subject so you can like, be free and when you are free then you like music, you love art, then you can express yourself in different ways in both subjects." [PS2, non-CCA]*

Ironically, a wider point of this sense of individualism seemed to be that they also did not wish to be socially rejected by their friends or family due to their choice of music, especially when they felt it was not considered sufficiently 'mainstream'. Hence their preference to sometimes enjoy music by themselves.

> *"I don't really like English songs or even Chinese songs – I prefer Korean songs… they [friends] might not like Korean songs because maybe they won't understand." [PS1, CCA]*
>
> *"I just listen to music myself when I'm home because my brothers, my sisters are really like, biased, like I think, and they always object to my choice of music is so horrible, so I just prefer to listen to it on my own." [PS3, CCA]*

5.1.6 TEACHER

From the students' comments, it was clear that the teacher played an important role in influencing the quality of their experiences during music lessons. When asked how they found music lessons in general, this student said:

> *"Sometimes it's boring, sometimes it's interesting. Depends on what the teacher is teaching." [PS2, non-CCA]*

During the lesson, some students felt that the clarity of instructions and feedback given by their music teacher made them understand the lesson better.

> *"Like sometimes when we play the wrong parts of the music or we sing the wrong line, she will just tell us and she will not scold us or something." [PS1, non-CCA]*
>
> *"Because the teacher teaches us very clearly and when we have tried the games, we can understand it better so it's easier to learn and remember." [PS2, non-CCA]*

The students also saw the teacher as a role model for the level of performance they wanted to aspire to.

> *"When we see the teacher play that time, we are like, 'oh my God the teacher is so good!' I want to be like the teacher…" [PS3, non-CCA]*

The teacher also helped the students by role modeling the appropriate technique or providing additional guidance to get them to be more focused.

> *"I think I feel motivated 'cause when the teacher plays, it sounds very good, but when you play it doesn't seem right and like, the teacher will like, encourage you… be like the teacher and play like the teacher." [PS3, non-CCA]*

> *"She'll like, explain, tell us how to like, improve in some ways. She will tell us whether our voice is really soft or loud, then she ask us to sing louder." [PS1, non-CCA]*

Encouragement was also freely given when it was deemed needed to elicit more effort and improvement from the students.

> *"Sometimes when she gives us feedback she will give us encouraging words because like, we need some improvement so she'll like say, 'do it again', then you can continue then try and try… some people will feel encouraged, then they will like, get better." [PS1, CCA]*

5.2 NATURE AND QUALITY OF STUDENTS' FLOW EXPERIENCES

This section examines the qualitative data to determine the quality of the students' flow experiences, if any, through the lenses of the nine dimensions of flow, namely challenge-skill balance, clear goals, unambiguous feedback, concentration, action-awareness merging, loss of self-consciousness, sense of control, time transformation and autotelic experiences.

In the first instance, there was some dicta from the focus groups in which students' descriptions of their experiences corresponded to flow.

> *"Because normally we like, do this [musical activity] most of the time then we like, tend to think of music and start to sing it or dance or beat with it or go in the modes or **go in the flow**, then after that we tend to like, suddenly realise that we are actually multitasking and playing games while doing music." [PS2, CCA, emphasis added]*

5.2.1 AUTOTELIC EXPERIENCE

I start the analysis from the dimension of autotelic experience as it was the prominent flow dimension based on the findings from the quantitative data. One of the key themes elicited from the data was that the students often had fun or positive experiences during music lessons. These positive experiences would appear to imply that there was enjoyment during music lessons.

> *"Music is fun to come to as you can laugh some awkward things with your friends and then learn new things about music and still have fun with friends and music." [PS2, CCA]*

"Because when we are in music class we don't see the time; we see how much fun we have. Our teacher is like, sing songs and then we ourselves will sing and then in between we joke around. I think music class is the only time when we have some freedom." [PS2, non-CCA]

"I like music lessons as normally during school lessons they could be boring but during music lesson it could be fun to me as I can do some music." [PS3, CCA]

This was sometimes aided, as in the case of PS2, by the teacher using games as a mode of teaching. Students would appear to favour such a learning approach as playing games was something that came naturally to them.

"Because the teacher teaches us very clearly and when we have tried the games, we can understand it better so it's easier to learn and remember." [PS2, non-CCA]

While it may be tempting to say that the students' perception of 'enjoyment' was more akin to the superficial kind of 'pleasure' that Csikszentmihalyi warned against, some of the feedback would appear to suggest that some deeper learning and understanding was taking place. When generically asked why they found certain musical activities interesting, students replied as follows:

"Because when we do it together, we can make a chord." [PS2, CCA]

"In music we can open our minds so that we actually learn a bunch more stuff than music alone. Like if we're learning foreign music then we can learn more about the culture of where the music came from." [PS3, CCA]

Some students went deeper, expressing an understanding of musical learning that went beyond the superficial learning of musical skills, such as creativity and the notion of music as a means of expressing feelings.

"…in music we can actually create our own things so it will be more enjoyable." [PS3, CCA]

"I think music can express our feeling, like sometime you feel so sad or so happy that you cannot use words to express you can use music." [PS1, non-CCA]

It therefore seems clear that some form of flow-based enjoyment took place in the classroom.

From the analysis in the previous section, another indication of the presence of flow linked to autotelic experience is the students' manifested intrinsic motivation to attend music lessons and learn music, which implied that they valued music for its own sake.

"It's just… want to learn [music] though it's very tiring. Even though it's tiring sometimes, I just want to continue. You don't want to stop." [PS1, CCA]

"'Cause normally in my class, music is the one thing that motivate me in class… so even though there is a difficult challenge we should face it, we will like, take the challenge." [PS2, non-CCA]

"Trying, trying, trying and trying [practicing music] until we get to the point that where we want to be." [PS3, non-CCA]

The presence of intrinsic motivation is important as it is something organic to flow. It is the enjoyment of the musical learning experiences leading to the students' desire to 'relive' the feeling of enjoyment that generates the intrinsic motivation.

Another point worth bringing out was that during the focus groups, I personally noted the students' generally enthusiastic responses when they elaborated on their enjoyment of music and music lessons. The students were also not informed of the questions beforehand and therefore did not have the opportunity to prepare their answers. I would take this as an indicator of their intrinsic interest in and enjoyment of music as the responses came across as sincere and spontaneous.

5.2.2 CHALLENGE-SKILL BALANCE

The students mostly felt that the music lessons were not very challenging, particularly those who were members of music CCAs and had thus enjoyed at least an additional year's musical training. When I put forward the question about whether they found music lessons not challenging, students from the PS3 CCA group replied resoundingly in the affirmative.

"…they usually teach stuff which are basic but then sometimes I'm just interested in what they are teaching us so it depends what they teach us in the music lesson." [PS3, CCA]

"I don't like music lesson because they teach all the basic things and then some I already know." [PS3, CCA]

For some, they found that what they learnt in their CCAs helped them to better understand what was taught in music lessons.

"Music CCAs is like a tuition. Teach us the fundamentals of music." [PS2, CCA]

"…what the teacher teaches us is actually what we have learnt these few years so I think it [music lessons] can be [made] more challenging to us." [PS3, CCA]

Even the students who were not from music CCAs reflected that they did not find music lessons too difficult for them. When I asked those students if they found what was taught in music lessons too challenging, they mostly replied in the negative though they mostly did not elaborate how and why. One student did indicate that he had gone through the activities before and as such, did not find them challenging

though he was referring more to the activities the lessons were based around rather than the musical knowledge or skills being taught. Nevertheless it did make his learning easier.

> *"When I was young I like to sing songs and play games together so it doesn't make a challenge if we do this in class." [PS2, non-CCA]*

For some non-CCA students, while they may have found the lesson somewhat challenging initially, they were eventually able to complete the tasks after trying.

> *"'Cause we get to try it ourselves so when you try it makes us clear. It's quite easy to understand when you have tried it. The teacher tell us like, the beats and then we try it ourselves then we will better understand what is taught and it makes everything more easy." [PS2, non-CCA]*
>
> *"Student: Garage Band… The teacher give us like, instructions on this kind of thing on how to do it. I feel it's quite hard and we ended up trying a lot of times because the first try fail and the second try fail again so…*
>
> *Researcher: At the end did you all manage to play the Garage Band?*
>
> *Yes we managed to play the Garage Band in the end." [PS3, non-CCA]*

However, both the CCA and non-CCA students agreed that the more challenging musical activities tended to involve learning to play musical instruments.

> *The xylophone [was challenging to learn]. Because… you shouldn't like, bang it very hard because the thing [mallet]… You have to, like hold it properly because like, when you hit it very hard it will, like break and then you have to see which tone is correct because like, you cannot play a song anyhow." [PS1, CCA]*
>
> *"Different instruments have different levels of difficulty. For example, the guitar right, you need to remember where to place your finger and it sometimes also make my finger very pain." [PS3, non-CCA]*

In spite of the difficulties they faced, the students were able to accomplish the instrument learning tasks set for them, which would appear to imply some degree of challenge-skill balance during music lessons, at least when it came to this type of lessons. In the end, the effort was worthwhile because they put in the effort and overcame the challenge to complete the task.

> *"Because in the end when we make right, then you keep repeating, repeating during the working time [lesson]. Then in the end you make out a nice song then you think, all your effort was worth it." [PS3 non-CCA]*

This sense of accomplishment felt is a potential catalyst for flow, as it could provide encouragement for students to want to learn more about music so that they could reprise the feeling of enjoyment, thus starting a virtuous cycle for musical learning.

5.2.3 UNAMBIGUOUS FEEDBACK

According to the students, the music teacher played a part in helping them better understand the lesson or improve their performance of the musical tasks by providing feedback when the need arose.

> *"Sometimes if we cannot play she will already come and explain to us how do we really pronounce the notes, maybe how we sing it better." [PS1, non-CCA]*

> *"…when you play it doesn't seem right and… the teacher will like, encourage you like, 'this is wrong, you can do it better by playing this'… Encouragement too like, be like the teacher and to play like the teacher." [PS3, non-CCA]*

In providing the guidance to help the students play better or have a better idea of how to accomplish the task, it could be said that some element of the dimension of unambiguous feedback was present in the music classes.

While a third party is a clear source of unambiguous feedback, it can also come from the participant himself/herself through an internal process in which he/she provides instantaneous guidance or feedback on his/her progress in the activity. There were some instances in which the students reflected such self-feedback.

> *"The xylophone [is challenging]… you shouldn't like, bang it very hard because… you have to like hold it properly because like, when you hit it very hard it will like, break and then you have to see the [sic] which tone is correct because like, you cannot play a song anyhow." [PS1, CCA]*

> *"Different instruments have different levels of difficulty. For example the guitar right, you need to remember where to place your finger and it sometimes also makes my finger very pain. [PS3, non-CCA]*

5.2.4 CLEAR GOALS

In the focus groups, the students did not explicitly state that the teachers had set clear goals for the music lessons. One CCA focus group did indicate that while they had no problem understanding what was taught in class due to their stronger music background, they noticed that their classmates who were not from music CCAs also did not appear to have issues as they thought the activities were "…very clearly explained" [PS2, CCA] by the teacher. This would appear to imply at least that achievable goals had been set and communicated to the students by the teacher.

In addition, implicit in the students' comments on finding the teachers' inputs useful is that the feedback was linked to some musical goals, which thus enabled the students to accomplish the task to some level of satisfaction. This would again reinforce the idea that clear goals had been set. In the case of instrumental playing,

the goals could amount to mastering the basics of the instrument or learning to play a specific song.

5.2.5 CONCENTRATION

Due to their enjoyment of the musical activities and the excitement generated by their anticipation of upcoming activities, the students found that they started paying more attention to the teacher's instructions.

> *"During the music lesson we can like, play games. Then after like, playing the games and listening to music, we can like, start to get excited. Then whatever like, after that… the teacher will like, teach us something, then since we are excited, then we tend to listen more and we are more attentive." [PS2, non-CCA]*

Other evidence of the students' state of concentration during the lessons was reflected, albeit in a negative frame, by some saying that they got annoyed when there were disruptions during the music lesson, especially for students from PS3.

> *"I really like music lesson. I am very interested to learn the guitar but then I'm really somewhat not looking forward to music lesson because every time people keep talking and keep interrupting the class…" [PS3, CCA]*
>
> *"[music lesson is] Boring. Because everyone in the class keep on disrupting the lesson, then I cannot learn. [PS3, non-CCA]*

5.2.6 TIME TRANSFORMATION

It should firstly be noted that as a matter of policy, primary five and secondary one students in Singapore schools are allocated a single 30-minute lesson each week, so lessons are not long to begin with. Nevertheless, there was clear indication of the students' perception of time having been affected during music lessons. For most, time seemed to pass faster than normal, with most attributing it to the fact that they found the lessons enjoyable.

> *"Or like, in the middle of the playing the bell suddenly ring, like eh, it's over and you are enjoying it and then suddenly you just hear the bell. The teacher says, 'line up, go back to class'. Then you just feel like, why is it so short?" [PS1, CCA]*
>
> *"We usually do a lot of different activities for the entire music lesson. Most activities just pass by in time flies." [PS2, CCA]*
>
> *"You get engrossed in the thing and it feels like it's only 10 minutes when it's 20 minutes." [PS3, non-CCA]*

Conversely, there were also suggestions that time passed slower than normal when the students found musical activities uninteresting or too challenging.

"…when you are stuck at some point you just don't want to play anymore. You give up and just look at the time and you found out that it's like, very slow and you still have to continue with what you are doing." [PS3, non-CCA]

"During National Day, our school every morning our teacher will like, go on and ask us to sing songs early in the morning and that day was music class. She made us sing all the National Day songs! I thought every time music lesson was going to be fun but that day was horrible…" [PS2, non-CCA]

The following quote succinctly summed up the nature of time transformation for the students.

"Like, when you are having fun, time like, passes by really really quickly, but then when we are getting quite boring then time like, pass by so slowly." [PS2, non-CCA]

This somewhat differed from Csikszentmihalyi's findings that sometimes time passed slowly even when the activity was enjoyable.

5.2.7 ACTION-AWARENESS MERGING

The remaining three dimensions of flow, namely action-awareness merging, loss of self-consciousness and sense of control, are more complex psychological processes that students may have difficulty understanding and articulating. As such, dicta relating to these dimensions were generally not pervasive.

For the dimension of action-awareness merging, the person is so immersed in the activity that his/her actions are done instinctively and without thought so that it almost appears as though the thoughts and actions are as one. In PS2, there appeared to be some manifestations of this during their music lessons, mainly when students referred to certain activities in which they seemed to be able to multitask and accomplish two tasks at the same time.

"When I learn music when we are playing a game I can actually memorise the songs." [PS2, non-CCA]

"We play the ball while singing and we see whether our beats are correct and follows our throwing." [PS2, non-CCA]

There were also instances in which students appeared to achieve mastery in their instrument and were able to play fluently.

"Playing the recorder [is easy] because just have to remember how to play it and then you can play already." [PS3, non-CCA]

5.2.8 LOSS OF SELF-CONSCIOUSNESS

When the dimension of loss of self-consciousness is present, it is said that the person is so caught up in the activity that he/she loses all sense of self during the activity and is no longer concerned about how he/she is perceived by others. In this

sense, the actions may be seen by others to be strange or unusual, but the person is not bothered by what others think and will continue their actions until the task is completed.

Some loss of self-consciousness was reported by the students in that they felt they were able to do whatever they wanted during music classes.

> *"You feel very lively because you just have to like… you can stand up instead of sitting down and just listening to the teacher, you can move around then, or sit or anything you want." [PS1, CCA]*

> *"And it doesn't matter if our teacher give us assignment for us to like, sing the music or like, write a part of the music, like lyrics and the notes or sound, you know. But since you are singing about anything, we can just sing freely, make the beats we want. As long as it sounds good to us…" [PS2, non-CCA]*

> *"I feel very relaxed and happy because when I listen to music it's like, I don't care about anything else..." [PS3, non-CCA]*

Students talked about how they could be more spontaneous during music lesson, especially when compared to academic lessons.

> *"'Cause normally in my class, music is the one that motivate me in class. You know me, during class I am a boy who will suddenly just start to sing, so even though there is a difficult challenge we should face it, we will like, take the challenge." [PS2, non-CCA]*

> *"I also think it [music] is better than other subjects because if you keep listening to the teacher all day long talking, talking, talking, later you still need to use your pencil or pen and keep writing and do the homework. But then music you can like, enjoy yourself and enjoy yourself." [PS3, non-CCA]*

From the above quotations, however, it was not clear whether the students were relating to a state of flow-like loss of self-consciousness, or whether they were merely expressing a sense of freedom or empowerment they felt during music classes, due to the more 'relaxed' atmosphere in general.

5.2.9 SENSE OF CONTROL

During flow, it is said that the person feels that he/she is in control of the situation even though it may in reality be posing considerable challenge and difficulty. The most poignant example given is usually that of a rock climber, who may seem to the observer as constantly being in a perilous situation, but due to his/her expertise, the climber was actually 'in control' of the situation. Hence, the dimension of sense of control is sometimes also referred to as the 'paradox of control'. Given the nature of the classroom music lesson as a platform for the delivery of base level musical knowledge and skills, and students' earlier statements that they did not find music lessons particularly challenging, it would seem unlikely

that students would be found in the kind of ‘paradox of control’ situation as explained above. However, there was a quotation from a student that delineated what she felt was a challenging task for her, but with practice and effort, gradually found herself able to gain control of her actions and perform the task.

> *“With the iPads you get to… motion with your hand, whether this hand will be doing the beat first and the other hand will be doing the beat slowly. Then you can like, start to know our body better and we can do things the way it is actually supposed to.” [PS2, non-CCA]*

CHAPTER 6 – ANALYSIS OF FOCUS GROUP DATA PART 2 – SECONDARY SCHOOLS

6.1 GENERAL THEMATIC ANALYSIS

A total of six focus groups were conducted with the secondary schools. For each school, a focus group was conducted with students who were members of the school's music CCAs and another with those who were not. Analysis of the data from the secondary school students' experiences during music classes revealed the following key themes:

(a) Positive experiences
(b) Motivation
(c) Collaboration
(d) Self-determination
(e) Engagement
(f) Teacher

As with the analysis for the primary school data, the secondary school students' quotations were left unedited to preserve authenticity.

6.1.1 POSITIVE EXPERIENCES

The secondary school students generally associated their music classes with positive experiences. It was clear that they liked music and enjoyed music classes in general, regardless of whether they were members of music CCAs. At some level, this enjoyment appeared to stem from an intrinsic liking for music and musical activities.

> *"I will say that making music is exciting because I like music so when I get a chance to make music I will also feel very happy." [SS1, non-CCA]*
>
> *"I look forward to every music lesson and like… I think music is one of the subjects that I pay more attention in because it is more fun and enjoyable." [SS2, non-CCA]*
>
> *"'Cause me and my friends we all enjoy music lessons so it's like, we sit together and we listen to the teacher in the lesson so it's like, kind of like, happy 'cause you are with your friends and like, learning something you love." [SS3, CCA]*

At the same time, there were also indications that this preference for music lessons appeared to stem from the students' thought of music classes as a time to relax. This may be due to music being a non-examinable subject and hence stress-free, that the students saw it as a refuge from the pressures of their regular academic work in their school lives.

"…playing the keyboard is like, something you don't usually do in normal classroom lessons, so it brings us away from boring classroom lessons and get to relax over here." [SS1, non-CCA]

"Music make me feel comfortable and relaxing at the same time because… and like listening to some smoothing [sic] music right, the piano playing, then it's like, more relaxing for me. Then when I study I also play the music and listen to it." [SS2, non-CCA]

"It's like a break from our lessons sometimes. 'Cause during [academic] lesson we feel very stressed out. Then when during music class we get to like, I don't know, like, relax for a while, listen to the music. [SS2, CCA]

"I enjoy and look forward to the music lesson 'cause it's like a break from all the other lessons." [SS3, non-CCA]

In the same vein, some students found music as a useful form of relaxation that helped them to prepare for learning or examinations.

"I quite look forward to it as sometimes making music can also help you release stress as it's like, you can put your emotions into the instrument." [SS1, non-CCA]

"To some people it [learning music] is not important but to me it is important because music just makes me more relaxed like, if tomorrow is exams, I usually listen to music before exam to calm me down so that I can learn better 'cause music really helps me to learn so it's important to me." [SS2, non-music]

"I like to listen to music myself because it calms me down more. Like when I'm doing homework then I'll [switch] on music while doing it. [SS3, CCA]

Students' expressed affinity for music classes, however, did not appear totally unconditional; there were some students who said that their enjoyment only extended to lessons they found to their liking.

"[music lessons can be] Stressful. Because, well, only when the presentation when you are alone or with just another friend. It's fine but I'm always worried when I perform in front of an audience." [SS1, CCA]

"I guess when we do like, group work and then we get to like, like how we need to do before that, like stomp and then we get to work as a group, those kind of things are pretty interesting. Other than that, but I don't really like, find it interesting when like, the teacher just like, explaining some things." [SS2, CCA]

"Sometimes I do and some other times I don't [look forward to music classes] because it depends on what we are learning. If we are learning about something that is difficult, or maybe something boring then I would like, I would really not look forward to the music classes." [SS3, non-music]

It seemed that the type of music lessons the students preferred tended to be those involving some active music-making, such as learning to play an instrument, or doing group work.

"I think because I can learn to use other instruments because I don't play any instrument and when music lesson came I was able to learn to play the piano, which was great." [SS1, non-CCA]

"I think one of the things that make it enjoyable is that when we discuss in the groups, then it's like, we will like, share our ideas and thoughts of it and sometimes some of them even have some funny ideas and make it enjoyable." [SS2, non-CCA]

"But sometimes it's [music lessons] really interesting when we do activities together. Then like that we can work as a group and everybody gets a part to do and everything." [SS2, CCA]

"At the first weeks of the music lessons ah, my teacher went through the different types of music. That was quite boring ah, to be frank. But after the guitar lessons came it's like, more fun." [SS3, non-CCA]

6.1.2 MOTIVATION

Overall, there were clear indications of the students' motivation to make and learn music. On the one hand, the students showed that they were motivated to learn music and attend music classes due to an interest or enjoyment of music, as evidenced by the following quotes:

"I will say that making music is exciting because I like music so when I get a chance to make music I will also feel very happy." [SS1, non-CCA]

"For me, it's more of knowing how happy I will be after I finish doing than I manage to complete something." [SS2, CCA]

"…I prefer to pay attention more in music class because it's something I am more interested in, and other classes, other subjects might be more boring." [SS3, non-CCA]

The students' motivation also extended to their willingness to work hard on difficult activities to able to accomplish them, another sign of intrinsic motivation.

"I think at the beginning when I am given a piece that I totally don't understand and don't know how to play… maybe I would ask the teacher how to play it. Then after that, once I maybe get a bit then I will start to try to gain interest in that thing, in the piece, then maybe… and will start trying to play that piece." [SS1, non-CCA]

"Because I don't want to give up easily on music because I have already started learning it and like music a lot, so I wouldn't want to give up." [SS1, CCA]

"In the past I was really bad at music during primary school, so I told myself I want to be better in music and want to be like those really good musicians, so got motivated so I joined a music CCA." [SS2, CCA]

However, much of their articulated motivation also appeared to be influenced by extrinsic factors. The students' peers was one factor that was cited as an influence in terms of seeing their friends make music and then wanting to be like or

as good as them. In the CCA context, it would be the senior members as they were tasked with helping teach the younger members and had close musical interactions with them.

> *"Sometimes watching my friends play make me inspired to play by myself, that's why I also want to… that's why I look forward to music classes." [SS1, CCA]*
>
> *"Because it's like, peer influence. I see people play the piano or the keyboard and some of them are already learn piano from a very young age so I feel very motivated to like, I guess, play as well as them." [SS1, non-CCA]*
>
> *"...'cause I see like, my friends and like, my family they all learn music and it's like… and then my others they are all so music talented. Then it's like, it motivates me to like, do harder during music lesson and CCA to like, play better and stuff like that." [SS2, CCA]*
>
> *"Yes. My seniors [what motivates student to learn music]. Because they are very fun to be with and then we also like, interact with each other when we want to like, learn a new song. And then they also teach me a lot. [SS3, CCA]*

For others, they were inspired by musicians in the family.

> *"I get motivated by… my cousin who can also play guitar because when he plays the guitar he looks like he doing it professionally and the music is very nice so I wanted to learn it so I can be as good as him." [SS2, CCA]*
>
> *"Guitar [what student wanted to learn]. Because my sister also learn guitar so I can play with her." [SS3, CCA]*
>
> *"My dad is my motivation. Although he doesn't play the guitar, he plays the drums so sometimes over the weekends… maybe we can go jamming. Then I will play the guitar while he plays the drums, so I will try to match the beat of what he is playing and sometimes he would teach me because he used to play bass…" [SS3, non-CCA]*

The wellspring of motivation from the students' families was not always musical reasons. As articulated in the Introduction chapter, there is a social trend in Singapore of parents with the economic means sending their children for music lessons, not always out of a love for music, but mainly to take part in the ABRSM exams to obtain music qualifications so that it would look good in their portfolio and help them in future school or job applications. This was alluded to by this student.

> *"Think it's because of my mum [that I am motivated to learn music]. Because she wanted me to play the piano when I was very young but I refused because somewhat before I didn't like the piano. I don't know why. But so I gave it a try and I think I enjoyed playing the keyboard." [SS1, CCA]*

Another spoke of how she sought to impress her family through trying to doing well in music.

> *"'Cause people, especially my family see me like not really like… like I can't do anything like, like I'm bad at academics, bad at all these, bad at sports and I want to prove to them that I am good at music so it makes me more motivated." [SS2, CCA]*

Some students were inspired by other musicians whose music they heard.

> *"For me I feel motivated by like, singers like those popular singers or like, composers. 'Cause… for example I name a composer Beethoven… he composes movies but he's deaf so that motivated me when I was young, younger back then to like, keep on doing music because in the past when I tried to do music, I can't. I can't even do the piano so it actually motivated me to keep on practising, keep on trying your best to like, do as many hard pieces as you can. 'Cause for me right, if you try something that is beyond your limits, you may never know if you are better than you are." [SS2, CCA]*

They could also be inspired by musicians they perceived as successful as they aspire to be like them.

> *"…all those composers a few hundred years ago, like Mozart or Beethoven kind of people, just want to be like them, very famous, play the piano very professionally." [SS1, CCA]*

While music is not an examinable subject, there was some indication that students would have been concerned about any grade they obtained had it been examinable.

> *"I think if it [music] becomes an examinable subject, I think I would still be motivated… partly because I don't want my grades to be like, not so nice in the report book and the other part is 'cause I really like music so I want to do well in music also." [SS1, non-CCA]*

6.1.3 COLLABORATION

Perhaps due to the group activities planned by the teachers, the music class for the students was appreciated as a platform where they could work together and get to know one another better.

> *"I also think we should play music together as it helps us bonds more and when you have bigger group you can make more varieties of music." [SS1, CCA]*

> *"I also really like the stomp project 'case we get to work in groups and we share our ideas." [SS2, non-CCA]*

> *"Can like, learn with friends and classmates lor. 'Cause usually like, you learn instruments at home by yourself. Teacher will like, teach you only ah, but in class is like, teach the whole class. Yah classmates." [SS3, CCA]*

> *"Yes, I look forward to music lessons because it is usually very fun and it's also a great time… and the teachers will also let us have time to like, bond and have a stronger friendship. [SS2, CCA]*

For the students, this was in contrast to the regular academic lessons in which students sat at their own tables and lessons were usually taught didactically. While group work was also an occasional feature of those lessons, the students appeared to appreciate that their musical activities were conducted in such a way that group work was a more authentic and regular occurrence.

"Like, yesterday we had music lessons and like, the teacher taught us… give us a beat and then we had to follow it and with that beat we played games and then we laugh with one another and like, don't know, pull us closer to one another so like, pretend that there is this clique… group of friends and another group then we try to bond with one another, like two different groups of friends coming together then becoming one big group of friends." [SS2, CCA]

Another thread that emerged was that students looked forward to the opportunity to work together with their friends to improve the music-making process through a sharing of ideas and different opinions, as shown by the following quotes.

"…it's easier to work with friends sometimes than working by yourself if you are trying to create music." [SS1, CCA]

"With friends we can be more creative because as the saying goes, two 'heads is better than one', so in a group one person can give one idea and another can give another. Then we can just add on to the idea and make better music." [SS2, non-CCA]

"…I'll prefer to make music with my friends because that way, there will be more input, there will be more creativity so it's not just my opinion on what to do so I think the will be better that way." [SS3, non-CCA]

For others, there was the added security of having their peers identify and help correct their mistakes.

"I would rather prefer to do it with friends because if I play music by myself I may make some mistakes without noticing it so but if I play with my friends they may hear the different note I am playing and correct me so when we perform we will not make any mistakes." [SS2, CCA]

"I would rather prefer to do it [make music] with friends because if I play music by myself I may make some mistakes without noticing it. So if I play with my friends they may hear the different note I am playing and correct me so when we perform we will not make any mistakes." [SS3, CCA]

Overall, the diversity offered by having multiple voices in the music-making process appeared to appeal to the students.

For some students, the sense of togetherness was not confined to their classmates; some felt that through the musical activities, they interacted and bonded with their music teachers as well.

"I think music lesson is very interesting because like, we play activities with one another and then playing the activities, we joke around with one another and have fun with the teachers also. Then it's like, very comforting to bond with the teachers who are not teaching us during other lesson other than musical [sic]." [SS2, CCA]

6.1.4 AUTONOMY

The students also valued music lessons as a time where they had the space for some measure of discretion in what they could do. This autonomy or

independence took a number of forms, such as creating their own works, having the opportunity to express themselves through the making of music, or at least some form of self-directedness in the activity.

> *"…for example if it's a new instrument you can experience how it's like and for me, I personally enjoy it because it's like, it can do all sorts of stuff to the instrument and create different music and looking, as XXX has said, looking at the score and playing the music is like, a different level from just playing the keyboard itself." [SS1, non-CCA]*

> *"Because our teacher is not that strict, so whenever it comes to the music lesson, then the teacher… they will give us a brief introduction and what to do then we can try most of it by ourselves." [SS3, non-CCA]*

The students from SS2, in particular, referred enthusiastically to a stomp (improvised percussion) activity which they had during music class as an illustration of an enjoyable activity that empowered them.

> *"It [the stomp activity] was something very original. I have never heard of it anywhere. I have seen it but I didn't know the proper name for it so when we got to learn it, it was like, it was very fun because we get to create. We are not restricted to one instrument. We get to use anything around us, like the chair, table, pen, our hand, the floor… anything basically other than an instrument." [SS2, non-CCA]*

In particular, a picture emerged that the students looked forward to music lessons as being a platform in which they could express themselves and be creative.

> *"I think it's the joy when you play the music because when you listen to music you listen to things that you enjoy and when you play it you are enjoying the music that you are playing 'cause it's personally by… 'cause you made that melody and it makes you calm yourself down so it's like, you would want to play it." [SS1, CCA]*

> *"I find it [stomp activity] unusual because usually when we do music we tend to use our voice and like, sing things but this one we just use our body movement or like, everyday items. Like my class, there was this group that just took simple boxes and packets of stuff and did the stomp and it sounded quite nice. It also gave us a chance to be like, creative." [SS2, CCA]*

> *"… we get more motivated for music since it's fun and like, we get to be very creative in music class so like… Not saying that other subjects don't make us more creative right, but music makes us more creative than other subjects." [SS2, non-CCA]*

> *"Yes I do [look forward to music classes] because currently right now, we are learning guitar and that's something I am very interested in. So if I have my own free time then I can re-arrange the chords by myself and maybe create my own rhythm or song." [SS3, non-CCA]*

This was once again in contrast to what the students perceived as the monotony or boredom of regular classes, already mentioned earlier, and this distinction was something that appeared to be of importance to the students, as articulated by students from SS2.

"Researcher: Would it be right to say that you all maybe find it [the stomp activity] more interesting because you decide what you want to do rather than the teacher telling you?

S: Yah it's like a project that is very free and open to all ideas.

S: Basically an exchange of… a different way of learning 'cause we get to do what we want." [SS2, non-CCA]

"Yah [during music class] we get to like, express ourselves more than like, be using books." [SS2, CCA]

6.1.5 ENGAGEMENT

Throughout the focus groups, as the students partook of music-making, the impression was that they were quite engaged in music lessons. There was a clearly articulated enthusiasm for musical 'activities' in which they had the opportunity to actively 'do' something (e.g. playing musical instruments), as opposed to passively sitting in class and listening to the teacher. At the same time, they did not appear enamoured of all types of music lessons, some expressing disinterest in lessons that were more theory-based or passive and lacking activity.

"I think because I can learn to use other instruments because I don't play any instrument and when music lesson came I was able to learn to play the piano, which was great." [SS1, non-CCA]

"I find music lessons quite neutral because sometimes the music lessons can get really very boring… like explaining to us what does… are used in music. But sometimes it's really interesting when we do activities together, then like that we can work as a group and everybody gets a part to do and everything." [SS2, CCA]

"To me only the guitar lessons were most interesting, not at the beginning because at the beginning we only learned types of songs, like the genres, so that one is more of… it's more of what we write, not what we can really do like, what we can try out like the guitar. We can try it." [SS3, non-CCA]

In particular, there was a sense that music class was preferable to other academic classes because it was more activity-centric and interesting and hence more engaging.

"Because it's like, music class is not like any other normal classroom classes where you just sit there, do work and listen to teacher. In music class you get to try the instrument, play the instrument. Some hands on…" [SS1, CCA]

"I think class time is all about books and syllabus and stuff but then during music it's like, like playing games and playing hands-on activities." [SS2, CCA]

Read with the other comments about academic lessons not appealing to them, it would appear that there is a general lack of affinity in students for a didactic style of learning, regardless of the subject, as they found that type of learning approach not

particular interesting. In music lessons they thought that they learnt something that was intrinsically different from their academic classes.

> *"It's just playing musical instruments that make it fun and interesting, like 'cause music classes are like, you learn how to play instruments and that's interesting lah, since you can learn more new things." [SS1, CCA]*
>
> *"We had a chance to play with our friends, the guitar and we can learn, ah, learn how to play new instruments." [SS3, non-CCA]*

6.1.6 TEACHER

While the students have expressed enthusiasm for music classes in general, whether the students' had positive musical learning experiences was dependent on the music teacher, as summarised by the following quote:

> *"I prefer any of the music lessons lah, because my teacher is like, more better than my last year's music teachers. Then this is like, my friends and I can talk ah, but not very loud and can make… have fun lah." [SS3, non-CCA]*

As they elaborated on their experiences in class, the students made constant references to their music teacher, who were described as making the effort to help the students to learn, leaving a favourable impression at many levels. At the fundamental level, the teacher designed the learning activities with the students in mind and provided valuable guidance that helped the students better understand the lesson and carry out the planned activities.

> *"The teacher has made it easier for us to understand what is being taught in the class so we can… I usually am able to understand what is being taught, yah, and execute it in a sense." [SS1, non-CCA]*
>
> *"…every music lesson the teacher usually builds up to the more challenging task but since we learnt the simper one before that, we can add that to the next one so it makes it simpler, the next task and on and on. [SS2, non-CCA]*

It was also said that they made the music lesson more interesting by adopting a more relaxed classroom tone and teaching approach:

> *"Well usually the teachers, they are the ones who make the class fun because each week and each lesson they usually bring newer and different things for us to learn so that's very fun.*
>
> *Researcher: So, if let's say the teacher wasn't around, will you still be able to have fun?"*
>
> *S: Not as much." [SS2, non-CCA]*
>
> *"The teachers are very funny. They make jokes a lot. They talk a lot also, like very funny, the way they talk are very funny." [SS3, CCA]*
>
> *"Think it's probably be the teacher personality, 'cause they are more fun-loving and like to interact with the class. 'Cause like I had guitar lessons in primary school and they were like, very boring even though I like music ah…*

We like to, know, have a playful environment so that you can learn better." [SS3, CCA]

The teacher also served as a musical inspiration or role model for the students. The teachers often performed or did musical demonstrations during music classes to guide learning and this often had a positive impression on the student.

"Listening to the teacher play and she plays the music without the score right? Ok, she plays with the score but it was really cool experience because I'm not like those grade 8 pianist so when she plays we get really inspired to continue playing." [SS1, non-CCA]

"For example, Miss X [the teacher], during the first few weeks of this term when we come in, she usually sings a song for us playing the guitar or ukulele so that when we enter we feel more motivated to learn music, look forward to the lesson. Usually the song she sings has something to do with the lesson that we are going to learn about." [SS2, non-CCA]

"Researcher: So what is it about the guitar lesson that you find interesting?

S: The teacher. 'Cause they like, sometimes play the music and it's very nice." [SS3, CCA]

The students also found that the personality of their teachers had a generally positive effect on them when it came to learning music. When asked whether what it was that motivated them to learn music, the students responded as follows:

"Well, usually the teachers. They are the ones who make the class fun because each week they usually bring newer and different things for us to learn so that's very fun." [SS2, non-CCA]

"Maybe the teachers. Maybe I look forward to the teachers 'cause the teachers friendly and sometimes fun." [SS3, non-CCA]

By making the musical activities varied, fun and interesting for the students, the teachers appeared to have a positive impact on the students', motivating them to look forward to the music classes.

6.1.7 SUMMARY

In all, the disposition of the students regarding their music classes generally appeared positive. The students seemed to be fairly engaged in the musical learning activities, inspired by their friends, family and teachers. While the students expressed their enjoyment in musical learning, they were also influenced by external factors, reflecting a comparable mix of intrinsic and extrinsic motivation.

6.2 NATURE AND QUALITY OF STUDENTS' FLOW EXPERIENCES

Similar to the primary school qualitative data analysis process, this section sets out the quality of the secondary school students' flow experiences, describing them through the lenses of the nine flow dimensions.

The presence of flow in the secondary school music classroom is intimated at in this quotation:

> *"I also feel that music is more different than other subjects… we just like, enjoy listening to the music and just follow the rhythm like what the teacher said. For example, just now my music lesson was like, just following the rhythm and clapping… well yah it's also boring but still it's not that much hard.* ***It's not much thinking as usual as other class like in the sense of like, hard work****." [SS2, CCA, emphasis added]*

Though not very clearly articulated, the student's perception was that learning music was very different from other academic subjects, a theme already discussed earlier. However, the words suggested a certain 'effortlessness' felt when engaging in musical activities (refer to emphases in quotation) not present in other academic classes, which would appear to hint at the presence of flow.

6.2.1 AUTOTELIC EXPERIENCE

As noted in the previous section, the students were found to enjoy and like their music classes and had an interest in learning music, which would suggest the presence of autotelic experiences. The nature of autotelic experiences as conceived by Csikszentmihalyi implied that the enjoyment went beyond a superficial kind of pleasure, but a deeper experience which was linked to an intrinsic appreciation of the activity in itself, and not because it brought any benefit. There were certainly some signs that the students enjoyed the classes because of an inherent liking for and eagerness to want to learn music and value it intrinsically.

> *"We just want to keep on playing and playing. You just want to feel that sense of achievement that could make us happy and then make us feel like, for example glad that we are playing that instrument, grateful that we are able to learn." [SS1, CCA]*

> *"I look forward to music lessons because music, we only have one period each week, and I really like music lessons because it's one in which you don't really have to study very hard for and I find it very relaxing." [SS2, non-CCA]*

> *"I just like all music lessons." [SS3, CCA]*

However there appeared to be some nexus between the fun and enjoyment of music classes and extrinsic factors, such as the teachers' pedagogy and efforts in making the learning interesting, or the nature of the topic or activity taught, which might detract from the 'organic' nature of the enjoyment experienced by the students.

"I find music lessons quite neutral because sometimes the music lessons can get really very boring… like just explaining to us what does… are used in music. But sometimes it's really interesting when we do activities together then like, we can work as a group and everybody gets a part to do and everything." [SS2, CCA]

"Well, music might be serious but yes, it's serious but we can have fun while being serious. 'Cause music is basically coming up with new pieces, like learning different ways of making music or different types of music, like how this music was created, by who so that if the teachers make it fun, because to me, students learn better when it's fun so that we can make it more… we can remember it longer." [SS2, non-CCA]

"I don't enjoy it [other music lessons] that much because it's more on theory and sometimes be boring compared to the guitar lessons, which are more practical. [SS3, non-CCA]

As already noted in the previous section, the secondary school students' motivation to learn music was likely to be influenced by pragmatic considerations, so this would appear to continue along that theme.

Nevertheless, there was dicta from the students to suggest that they did value music intrinsically, evidenced by their motivation to overcome challenges to learn and complete musical activities.

"…the challenge [of playing music] is what makes it interesting. It brings like, it brings out those feeling where you must do it, it's like motivating yourself to work towards that goal of managing to play the piece." [SS1, CCA]

"I think I will be motivated [to learn music] 'cause it's not reason to like, not to be motivated if you are… the piece, the songs start to get harder. It's just like a challenge for yourself so that you can improve more." [SS2, CCA]

"…currently right now we are learning guitar and that's something I am very interested in so if I have my own free time then I can re-arrange the chords by myself and maybe create my own rhythm or song." [SS3, non-CCA]

Ultimately, there was a sense that the students enjoyed making music and the sense of achievement they felt when they accomplished a musical task.

"I think it is the joy when you play the music because when you listen to music you listen to things that you enjoy and when you play it you are enjoying the music that you are playing 'cause it's personally by… 'cause you made that melody… there's a sense of achievement…" [SS1, CCA]

6.2.2 CHALLENGE-SKILL BALANCE

When the question was posed to them, the students from both the music CCAs and non-music CCAs were quite clear in saying that they did not find music classes particularly challenging or difficult to understand.

"Researcher: So, generally do you all have any difficulty understanding what is taught in music class?

Students: Not really." [SS1, CCA and non-CCA]

"Researcher: Do you all find music class activities too challenging for you?

Students: No." [SS2, CCA]

"Researcher: So, you found it [music class] not difficult because what was taught was not difficult or the teacher's explanation was very clear?"

"It was not difficult." [SS3, non-CCA]

In some cases, the students felt that this was because the teachers had been effective in their pedagogies and teaching so that they were able to carry out the musical activities, as expressed when they were asked if they found their music lessons challenging.

"I don't see it as a challenge… not really as a challenge because I don't think it's very difficult here. The teacher has made it easier for us to understand what is being taught in the class so we can… I usually am able to understand what is being taught, yah, and execute it in a sense." [SS1, non-CCA]

"Not really because every music lesson the teacher usually builds up to the more challenging task but since we learnt the simpler one before that we can add that to the next one so it makes it simpler, the next task and so on and on." [SS2, non-CCA]

For some students from the music CCAs, they tended to find their music CCA lessons more challenging and as a result of their additional experiences in the CCA, they found they were better able to manage the activities conducted during music class.

"Because I play bassoon [in my CCA] and there's like, lots of fingering and all those embouchure, it's very different from keyboard [which is taught in music class] where you just play using your fingers. Also, there's breathing… all sorts of stuff so it's very complicated so I think it's tougher than playing on the piano." [SS1, CCA]

"Researcher: So for you, you have found that your playing in the band has helped you in the music class, is that correct?

S: Yah, slightly. But when I'm not sure of the notes I ask my friends what is the correct note lah." [SS1, CCA]

"For me I feel that in my CCA lessons is way much tougher than for my usual lessons… if like, for a class with my classmate we only learn about the beats, rhythms, tempo, timbre… something like that etc. But for my CCA lessons we do something like, more advanced, like how to play notes, how to read notes, how to read scores and how to read… yah." [SS2, CCA]

"Not difficult. 'Cause I learn the guitar before already or I heard like, whatever the teacher say I heard before and tried before already." [SS3, CCA]

However, this sense that having prior music knowledge helping understand music lessons also extended to the non-music CCA students.

"I would say like, it's manageable. The theory is like, on the different genres and as I listen to music often I know them well." [SS3, non-CCA]

"Yah then all we had to do was, whenever the teacher asked us to play what chord, then while other friends are having difficulty finding which position their finger should be on, I already have formed the chord because since I had some knowledge about it." [SS3, non-CCA]

Conversely, there was another strand of dicta which suggested that the students labeled as 'challenging' any musical topic that they were not familiar with.

"I did understand [music lessons] but then sometimes it might be difficult. I think our second lesson, it was about the genre of music but then… hip hop or R & B I don't listen to it so I don't know what they are. I found it hard to understand." [SS3, CCA]

In this regard, it could be said that the students were not considering the difficulty of the music class based on whether they found the learning process or musical activity challenging, but on their familiarity with the topic or activity.

6.2.3 UNAMBIGUOUS FEEDBACK

In a classroom, feedback for improvement and guidance would most often come from the teachers. The secondary school students indicated that their teachers generally gave clear instructions before lessons and feedback during and after lessons and that helped them to understand and carry out the lesson activities.

"I don't think it's very challenging because the teacher will go around and help those students who have difficulty, so as you go along you could… if you made a mistake, you have the teacher to help you or those who have musical background to help you also. So it won't be much of a challenge if you face a difficulty in reading notes or playing that part." [SS1, CCA]

"I don't' have any difficulties [understanding music classes] because the teachers keep it simple, straight to the point like, they don't beat around the bush. So they just get straight to the point." [SS2, non-CCA]

Researcher: "Do you find that the teacher gives you very clear instructions on what you are not doing correctly so you can improve?

S: He's not singing; he's playing. Yah he will say very clearly." [SS3, CCA]

From the first quotation, it would appear that students sometimes also received or sought feedback from fellow students they regarded as musically knowledgable. This is consistent with Csikszentmihalyi's idea that unambiguous feedback could also come from peers and others regarded by the recipient as being competent to provide it. The next quotation is another illustration of peer feedback being sought:

"I don't have difficulties because even if I don't understand some of the things that the teachers taught, I can always ask my friend for what teacher has just said." [SS2, non-CCA]

Feedback would appear to be either provided by the teachers or sought from both the teachers and their peers.

6.2.4 CLEAR GOALS

The students did not make any explicit mention of clear goals being communicated to them with regards to the music lessons. However, it could be implied from their constant reiterations that the music teachers made efforts to explain the lessons that goals had been set and communicated to the students, as evidenced by the following quote:

> *"I have no difficulty understanding [music classes] because the teachers explain it very well and clearly so I can perform the task well." [SS2, non-CCA]*

6.2.5 CONCENTRATION

For the dimension of concentration, there appeared to be a few strands of references alluding to its presence. In the first, the students referred to their concentration on the class activities.

> *"Building up to our stomp project, me and my friends, the group, was making beats over beat over beat and we were talking so the beat led to another beat then before we knew it the class ended." [SS2, non-CCA]*

> *"Yes of course I will concentrate on the lesson. Although I know I have some knowledge about guitar, I would try to focus on the lesson because there might be some knowledge that I might not have studied before." [SS3, non-CCA]*

There were also suggestions from some students that they concentrated more during music class than for their other academic classes due to their preference for music.

> *"For music class… they are pretty much the same. But I prefer to pay attention more in music class because it's something I am more interested in, and other classes, other subjects might be boring." [SS3, non-CCA]*

However, another strand referred to students getting upset when their enjoyment of music classes was disrupted by noisy classmates, suggesting that their flow experiences had been negatively affected.

> *"It [enjoyment of music class] actually sometimes depends as there are sometimes those troublemakers that will like, they will disrupt the class and sometimes they will even like, annoy you and then it will make you not enjoy the lesson." [SS1, CCA]*

6.2.6 TIME TRANSFORMATION

For secondary schools, the national recommended time allocated for music classes for secondary school students is a single period of 30 minutes. To the students, this was not a lot to begin with and the general sense was that time tended to pass quickly, not often helped by the time taken by their classmates to settle down as mentioned by students from SS3:

> *"Yah very quickly [time passes]. Because unlike many classes we only have one period for music and every time we have to greet the teacher, we have to sit down and make sure that everyone is listening to the teacher, so like, sometimes the teacher has to shout at us to be quiet you know. And after that, if we do a chord then the teacher must check lah, wasting time ah." [SS3, CCA]*

> *"Maybe they can increase the time for music because we only have like, only one period and one period, by the we finish … the class before music and by the time we get to the room, it's takes like 10 minutes so it's like we are wasting 10 minutes of the 35 minutes so it's like, we only have 25 minutes." [SS3, non-CCA]*

This was a theme repeated by students from SS1, who found disruptions to the class by their rowdy peers irritating, shortening time even further.

> *"There's so much chaos in our class because some people don't really obey… follow the teacher's instructions so… which leads to us having lesser time to play, to learn 'cause the teacher have to spend time scolding the students who are not behaving well." [SS1, non-CCA]*

> *"When the teacher asked us to play, practise our pieces because the teacher wanted to have sort of a competition to see who was better playing, the class was very noisy so everybody occasionally stopped but some people continued and they didn't care, so time passed quite quickly because nobody really cared about the teacher." [SS1, CCA]*

Disruptions aside, the students generally found that time passed quickly because they enjoyed music classes.

> *"Because we mostly enjoy our time here in music lessons, so it just passes so quickly, and then it's like, 'oh no!'." [SS1, non-CCA]*

> *"Researcher: Do you all find that when you are having music class sometimes time passes very quickly?" All students: Yah. Researcher: Is that the same for all of you?*

> *Student: Because sometimes in music class…*

> *Student: We find it enjoyable." [SS2, non-CCA]*

> *"I feel like time pass by like, very quickly because we are enjoying ourself playing the guitar." [SS3, non-CCA]*

Another reason given for the perception of time passing quickly was that students found the music lessons engrossing.

"I think it [time] will [pass quickly] when we are trying… we are learning how to play the music from the score sheet, like learning how to play the notes. We have to repeatedly keep playing it and then we finally get it, and then you look at the clock, oh lesson is over and we are not able to continue playing." [SS1, non-CCA]

"I think it's also a stomp project because we have to discuss, then we discuss, we tends to discuss a lot and then like, the time flies very fast." [SS2, non-CCA]

"Like what she said, I mean, time passes very quickly 'cause most of the things occupies me, it's very interesting so to me, time passes very quickly." [SS3, CCA]

However, there were also instances when the students found that time passed slower, though this was not common.

"Too slow. 'Cause like, keep repeating the same thing." [SS3, CCA]

6.2.7 Action-awareness merging

The dimension of action-awareness merging is more likely to emerge in flow experiences of musicians at peak levels of performance given the high degree of absorption required. In the hustle and bustle of an everyday music class of regular students, there were nevertheless some hints at its presence, as evidenced by the following quotations:

"I think learning how to play on the keyboard while looking at the scores. More of playing and… playing on the keyboard is like, something we don't usually do in normal classroom lessons, so it brings us away from boring classroom lessons and get to relax over here, yah, and play the keyboard." [SS1, non-CCA]

"When I'm playing, I don't really think about anything else; I only think about the guitar mostly." [SS3, non-CCA]

What these quotes seem to imply is that when students attain a certain level of competency when playing instruments, they may find themselves so absorbed that they perform the activity in an 'automatic' way without thinking.

6.2.8 Loss of self-consciousness

Instances of students reporting loss of self-consciousness were uncommon, as the concept itself may be difficult for students aged 13 to understand. There was a brief remark, albeit in the colloquial Singlish, from a student describing her keyboard class that hinted at its presence:

"Yah and just anyhow playing. It's like, different." [SS1, non-CCA]

What the student meant when she said 'anyhow playing' was that she could play in any manner she liked, which would imply that she was not too worried about what

others thought about what or how she played it. Another, albeit more context-specific, quote may also be relevant.

> *"I find the stomp project interesting because we get to like, get into groups and all the team members will be able to like, say their ideas of what they want the performance to be like and then perform it to the teachers and students." [SS2, non-CCA]*

Implicit in the student's words was the sense that, at least in the stomp activity, the students were comfortable doing whatever they wanted for their presentation, which would also hint at the presence of loss of self-consciousness.

However, there were also instances in which the students from SS1 actually seemed quite self-conscious when it came to music-making in class, even those from the music CCAs.

> *"[music lessons can be] Stressful. Because, well, only when the presentation when you are alone or with just another friend. It's fine but I'm always worried when I perform in front of an audience." [SS1, CCA]*
>
> *"'Cause sometimes I sing along and I'm like, that's embarrassing." [SS1, CCA]*

The students would therefore appear to be either quite conscious of making mistakes or how they were perceived by their peers or family when making music.

6.2.9 SENSE OF CONTROL

As set out in the parallel sub-section for primary schools discussed earlier, the dimension of sense of control is one that would be very difficult for students, even at the secondary school level, to comprehend and articulate. Aspects of it appeared to be manifested in the following short quotations:

> *"I find it quite interesting. After all, it's like – how do I say this also – after all you can like… you get to learn new stuff and then you get… for example if it's a new instrument, you can experience how it's like and form me I personally enjoy it because it's like, it can do all sorts of stuff to the instrument and create different music…" [SS1, CCA]*
>
> *"Like, sometimes we are very scared lah. If we hold the instrument wrongly, the teacher will scold. Like after the teacher correct already, we have confidence lah. We are not scared if the teacher will scold." [SS3, CCA]*

What the students appeared to suggest was that when they acquired some measure of competency in what they were learning, they would feel some degree of 'control' over it to be confident enough to take (unpleasant) feedback. By the same token, such a sense of 'control' could also equip the student with the awareness of when a musical task might be too difficult for him/her, diminishing the level of enjoyment.

> *"…if it's too hard for me to do, I think it's like, better to know when is the time to stop because if you push yourself too hard you might get disappointed in yourself." [SS1, non-CCA]*

CHAPTER 7 – ANALYSIS OF VIDEO OBSERVATION DATA

7.1 INTRODUCTION

This chapter sets out the analysis of the four music lessons (two for primary schools and two for secondary schools) that permission for video recording had been obtained. As the research is intended to examine the nature of flow in the music classroom, I will analyse the videos through the lenses of the nine flow dimensions, namely challenge-skill balance, clear goals, unambiguous feedback, concentration, loss of self-consciousness, action-awareness merging, sense of control, time transformation and autotelic experiences. Specifically, I will be looking at the actions of the students as well as their interactions between the teachers to determine if there are observable manifestations of any of the nine dimensions during the lessons. For example, if the students were observed as watching the teacher and quietly listening as the teacher was talking, it could be said that the flow dimension of concentration was present. As another example, if the students were observed laughing (where possible) or generally showed enthusiasm and/or enjoyment during and after the musical activity, these could be interpreted as signs autotelic experience.

As explained in the Literature Review chapter, the nine dimensions of the flow experience can be divided into three phases: pre-flow (challenge-skill balance, clear goals, unambiguous feedback), which are the pre-conditions for flow; flow (concentration, action-awareness merging, loss of self-consciousness, sense of control, time transformation), which describe the state during flow; and post-flow (autotelic experience), which is the outcome of flow. The dimensions in the flow phase reflect the psychological state of the person performing the activity and, with the exception of concentration, thus less amenable to observation. However, the opportunity to observe flow in an authentic music classroom would provide an invaluable insight into how flow might be manifested in a real-world regular lesson setting, hence the development of the flow observation Table 3.5 set out in the Methodology chapter. Examined alongside the quantitative and focus group data, a clearer composite picture of flow might be painted and understood.

While I had relied on Table 3.5 to determine the presence of the flow dimensions, I did not discount the possibility that there were other possible manifestations of the flow dimensions. When analysing the interactions, while the content of the dialogue between the teachers and students would be relevant, what was also important for this research would be the observable behaviour of the

students in their interactions with the teachers and among themselves in connection with the musical activity. As the nine dimensions reflected the psychological conditions of flow (Csikszentmihalyi, 1990), what the students could be observed doing and their interactions with others during the lesson could provide some manifestation of their mental state that reflected the nine dimensions and hence their experience and the presence of flow.

As already mentioned in the Methodology section, I had not specified for a certain type of music lesson to be conducted; I had asked the teachers to let me observe any lesson they were comfortable with so as to maintain the authenticity of the observations. The lessons therefore did not have a common theme or approach, and what was taught was the lesson the teacher had already planned to teach on the day. The recommended time for music lessons for both the primary five and secondary one classes is one school period, typically lasing around 30 minutes. Both lessons were conducted in the respective school's music room purpose-built and equipped for the teaching of music lessons. These are sound-proofed to a certain extent to keep the sounds of the hustle and bustle of school out and also to prevent sounds from any musical activity from disrupting nearby classes. The music rooms are also larger than the standard classroom to facilitate musical activities involving movement or multiple instruments.

As with the approach for the focus group analysis, I will firstly analyse the lessons without any pre-conceived frame so as to paint an authentic portrait of the actual comings and goings of typical music lessons in Singapore primary and secondary schools.

7.2 PRIMARY SCHOOL LESSONS – GENERAL THEMATIC ANALYSIS

In the PS1 lesson which lasted for a single school period of around 30 minutes, the teacher firstly conducted a singing activity to go through the Children's Day song the students would all have to sing in a few days' time, followed by a short performing activity to introduce the class to playing the hand bell in which eight students were each given a hand bell with a different pitch to play a song in an ensemble setting. The PS2 lesson which lasted for two periods totaling around 60 minutes, involved the teacher conducting a rhythmic activity to teach the concept of musical scales to the students.

The key themes that emerged from the observations were as follows:

- Teacher-centricity

- Focus on learning outcomes
- Discipline
- Enjoyment

In the following analysis, the specific timing in minutes during the lesson when the described activity was observed is denoted by [xx:xx-yy:yy], where xx:xx denotes the minute during the lesson when it was observed and yy:yy the ending minute.

7.2.1 TEACHER-CENTRICITY

This was a theme that was strongly observed in the primary school lessons, the extent to which the teacher dominated the learning process. This was manifested in the teacher being observed constantly giving detailed instructions, explaining the lesson, providing immediate feedback to students on their task performance, doing activity demonstrations and maintaining class discipline. Both lessons were highly structured with the teacher doing the talking most of the time during the lessons with a lack of student-led activities.

In the case of PS1, the teacher's learning approach was largely based on rote learning, a strongly teacher-centric approach, in which the students repeated what she asked them to do in order to learn the song, such as getting the melody and lyrics right. At one point, the teacher asked the students to repeat after her when reading the lyrics to ensure the accuracy of the pronunciation of the Malay words [10:00-12:00] The teacher was also observed explaining the meaning of the lyrics (as Malay is the language of the minority Malays in Singapore), providing the students with a working understanding of the intent of the song, as well as checking that their pronunciation of the words was correct [2:00-5:00]. Throughout the lesson, she could be observed demonstrating to the students in different ways: at one point, she demonstrated the correct point in the music they should start singing while also playing the piano [6:00-7:00]; at another, she sang a section of the song that the students had sung incorrectly to correct the mistake [8:00-9:00,15:00-16:00]; later she also showed the students the proper way to play the handbell [17:00-19:00]. She also constantly encouraged the students by praising them for their effort and for doing well [10:00-11:00, 21:00-22:00]. Throughout the teaching of the song, there were also other instances of the teacher focusing on small details, such as getting the students to sit up straight [5:00-6:00]. The teacher's strong influence on the lesson continued into the second activity of playing handbells. Firstly, she selected the students for the activity and organised them, lining them up and assigning the

parts [16:00-17:00]. Then she gave instructions on how to perform the activity, providing feedback on the students' technique and playing [18:00-21:00] and was constantly managing how the students carried out the activity.

The story for PS2 also saw the teacher being heavily involved in the activities. She firstly led the class in the warm-up exercises [1:00-7:00], before spending considerable time giving detailed instructions on the ball-throwing musical activity [8:00-12:00]. At the very start, she laid down her ground rules, which emphasised "…respect and participation" [2:00-3:00]. Throughout the class she was heavily involved in the lesson, facilitating and demonstrating the activity while playing the keyboard. As the students carried out the activity, she was constantly providing detailed feedback to them about their progress and ensuring that the activity was done correctly to her instructions. After each round of the activity, she also facilitated discussions and reflections with the students about how well they did and how they could improve [e.g., 22:00-25:00], encouraging them to try again. Whenever it appeared that the class was losing focus, e.g. students got over-excited or started talking and not paying attention, she would also take steps to bring the students' attention back to the activity (e.g. at 28:00-29:00, there was a process in which she clapped a rhythm and the students had to echo the rhythm in response and in doing, she regained the students' attention). She also tightly controlled the progress of the activity, breaking it into stages and making sure that students had gained confidence sufficiently before gradually increasing its difficulty level.

7.2.2 Focus on lesson goals

There was a sense in the classes that the teachers had very clear ideas about what they wanted to do in their respective lessons and were very focused on achieving the lesson or learning outcomes. In PS1, for example, the teacher stated at the very start of the lesson that she wanted to revise the song *Semoga Bahagia* and proceeded to carry out the lesson quickly and systematically, firstly going through the lyrics before leading the students to sing through the different verses of the song. For PS2, the focus was on going through the concurrent ball-throwing and singing activity to imbue in the students a stronger sense of where the beginning of a musical bar and the emphasis point of a musical line was. The lesson was planned in a very sequential manner with the activities being highly repetitive in nature and also increasing in difficulty. In both classes, the teachers set out very clear learning goals, either at the start of the lesson or, in the case of PS2, updated them as the

lesson unfolded, and the students were required to go through the activities. That the students had neither room for their inputs nor flexibility on how the activities were to be carried out added the seemingly singular focus on achieving the pre-planned lesson goals.

The focus on lesson goals was also evidenced by a constant stream of feedback provided by the teachers throughout both lessons. For PS1, the teacher was giving the students various pointers, such as proper singing technique [5:00-6:00], how to pronounce the Malay words [10:00-11:00], parts of the song that needed improvement [7:00-8:00], correcting students' handbell playing technique [20:00-21:00] and tips on how to improve their ensemble playing [26:00-27:00].

7.2.3 Discipline

The teachers in both schools were seen to emphasise some measure of student discipline during their respective lessons. There was a deliberate effort on their part not just to exert control over the lesson proceedings, but also to ensure that students were kept focused on the task at hand and not distracted by their friends or anything else. E.g., at the very start of the PS1 lesson, when she found the students talking among themselves, the teacher was seen to fold her arms and tell the students that if they "…continue to make noise, the half an hour will pass by very fast…" [around 0:30], which resulted in the students quietening down immediately. In a similar vein, the teacher in PS2 often used a clapping activity or a 'call and answer song' to get the students' attention whenever she felt they were getting too inattentive talking among themselves, which she used several times during the lesson [3:00-4:00, 7:00-8:00, 19:00-20:00, 28:00-29:00, 37:00-28:00, 43:00-44:00].

7.2.4 Enjoyment of musical activities

The students were generally observed to enjoy their music classes, which were punctuated with copious amounts of laughter. Though the teachers did make some attempt at humour, it was noted that the students' mirth was mostly derived in the course of participating in the musical activities. This was especially so in the case of PS2, where the students clearly enjoyed the novelty of having to 'sing', watch out for and throw or catch the ball at a particular count in the 'song' as they went through the activity several times over the course of the lesson. There were also points while they were doing the activity when obviously something funny happened, as evidenced by the roars of laughter and in one case, students rolling on the floor in

laughter [at 30:00-31:00], adding to the students' general sense of fun and enjoyment. For PS1, the enjoyment during the first singing activity was less evident, as the teacher was focused on getting the students to revise and sing the song properly for Children's Day, though she did try to lighten the mood by cracking the occasional joke [e.g. at 3:00-4:00]. There was an increase in the instances of observable enjoyment during the handbell activity, with the students appearing excited at the prospect of playing the handbell, which might have been something new for most of them. There were also instances of enjoyment as the students chosen to demonstrate were warmly applauded by their peers for their efforts [20:00-21:00] and when a student unintentionally did something that they thought was funny [19:00-20:00]. In general, it was observed that the mood for this activity was lighter than during the singing, and the lesson was punctuated by students' laughter (both performing and observing) as they were engaged in the handbell playing.

7.3 PRIMARY SCHOOL LESSONS – OBSERVATIONS OF FLOW

7.3.1 CONCENTRATION

Concentration appeared to be the flow dimension most frequently manifested and noted in the observations. For PS1, the students were all looking intently at the teacher and keeping very quiet when she was giving instructions and guiding them, suggesting that they were paying attention and listening. Throughout the lesson, there was also minimal talking among the students. The presence of concentration can be further affirmed through the students' quick response to the teacher's instructions. It was also noteworthy that there were few disruptions during the lesson. While there was more chatter among the students in the PS2 pre- and post-activity, this reflected the excitement felt by the students rather than boredom or distraction. They also looked more focused during the activity, which was complex and required greater a high state of alertness, and hence higher levels of concentration, to accomplish. It was also noteworthy that both lessons featured considerable teacher facilitation, especially for PS1. Teacher-centricity which takes the form of the teacher controlling almost all aspects of the classroom as well as being the main agent for teaching and learning is a common feature of Singaporean schools, despite recent efforts by MOE to move towards student-centricity.

7.3.2 CLEAR GOALS

With the pre-eminence of the teacher in the classroom, the dimensions of clear goals and unambiguous feedback were also prominent. Clear goals usually took the form of elaborate instructions to the students on their musical task. For PS1, the objectives behind the singing of the song were clearly articulated at the beginning of the lesson, namely to practise the song with the students to prepare them for the mass singing activity as part of the upcoming Children's Day celebrations. When the students moved onto the second task, which was for the students to play the song 'Twinkle Twinkle Little Star' on the hand bell together as an ensemble, the teacher also provided clear instructions on how the hand bell activity could be carried out, to which the students were then able to carry out successfully. For PS2, while the teacher preferred to explain the activity's objectives at the end of the lesson, she did make it a point to give clear instructions on how to carry out the activity at each stage. Every time an attempt at completing the activity ended, she also made it a point to walk through the instructions again to ensure the students understood what they were supposed to do.

7.3.3 UNAMBIGUOUS FEEDBACK

Throughout both lessons, the teachers were proactively providing feedback to the students on their progress in accomplishing the musical activities. For PS2, the teacher would firstly ask the students for their own thoughts on how they had performed on their task, providing an opportunity for peer feedback and reflection. This was therefore a clear case of a form of 'internal' feedback provided by the students themselves for their own improvement. She would then complement or affirm those with her own observations before getting the students to try the task again, sometimes setting them slightly higher targets, or proceed to the next stage, as the case may be. The feedback she provided took one of two forms: pointing out areas for improvement and giving practical advice on how improvements could be made, as well as affirming good performance. E.g., in the activity, the students were supposed to receive the ball on the beat, but most of them were throwing them on the beat instead. The teacher therefore asked the students to anticipate and throw the ball before the beat to ensure their friend could catch it on the beat. It was important to note that subsequent to the feedback, the students showed noticeable improvement when they tried the activity again, an important by-product of

unambiguous feedback. For PS1 during the singing activity, the teacher was constantly pointing out mispronunciations of the lyrics (which were in the Malay language, and hence not native to most of the students) and corrected rhythmic and melodic errors to ensure that the song was sung properly.

7.3.4 CHALLENGE-SKILL BALANCE

While the dimension of challenge-skill balance would not typically be easily observed in class, given that this would be more reflected in the teacher's planning for a lesson of suitable difficulty level for the students, the way the lesson tasks were carried out nevertheless reflected its presence. A good example could be seen in the PS2 lesson, in which the teacher broke down the musical task into a few different stages, giving clear instructions at each juncture. This ensured that the students were able to master the different parts of the task progressively before the teacher pieced them together to form a more complex task at the end. The teacher in PS1 also took into account the challenge level of the singing task, understanding that even though the students were familiar with the song having had to sing it every year for Children's Day, she needed to refresh their memory of the lyrics and melody. Hence the students first sang the song with an accompaniment in which the song's melody could clearly be heard, before moving to a piano accompaniment she played herself. For the second activity, she also made it a point give detailed instructions and guided the students throughout the activity to ensure they were able to carry it out properly.

7.3.5 AUTOTELIC EXPERIENCE

The dimension of autotelic experience also appeared to be particularly prominent for the PS2 lesson. This could be seen in the buzz the students generated throughout the lesson, whether it was preparing for the activity to begin or the enthusiasm they showed doing the activity, even for those who were not receiving the ball and hence not engaged. At all times they were singing intently while keeping an eye for the ball that might come their way. There were also many bouts of carefree laughter when the students saw what they thought were funny things happening when their friends were not able to catch the ball or when the ball struck someone. There was a generally relaxed and easy vibe to the class and the students clearly enjoyed the activity. While the tone of the PS1 lesson was altogether more serious, with the teacher keeping a firm hand on proceedings, the students were

noticeably engaged in the activities and were trying their best to accomplish their tasks, even if the singing of the Children's Day song was something they had to do every year and it was a song they were familiar with. There were few disruptions and the teacher also often peppered the lesson with humour to lighten the mood by cracking jokes or making funny comments, e.g., when going through the lyrics of the song which elaborated on how young people should behave, upon receiving no response from the students she suggested rhetorically if they should act "…like a gorilla" (PS1: around 3:24) and exaggerated the rough sounds made by a gorilla, drawing laughter from the students. There was also laughter during the second activity as the children watched their friends' nascent attempts at playing as a handbell ensemble, with some of them inevitably missing their cues or coming in at the wrong time, which the students found funny. I find that the laughter of the students is important as a manifestation of autotelic experience as it reflects the lightness of the mood and the student's overall enjoyment and positivity towards the lessons. Both teachers, while ensuring that the lessons proceeded smoothly, clearly had good rapport with the students and allowed the students to express themselves. The teacher for PS2, for instance, had set two clear simple rules to the students to create conducive conditions for the lesson, which she continually reminded them: respect and participation (PS2, 2:00-3:00).

7.3.6 Loss of self-consciousness

Given the actual duration and stop-start nature of the musical activities, there were not many clear instances of the dimension of loss of self-consciousness. Some manifestation of it could be observed during the warm-up activities conducted at the beginning of the lesson at PS2, which involved the teacher leading some exercises that loosened the students' joints and vocal cords. Initially, some students smiled and appeared hesitant to do them, perhaps concerned that they might look 'silly' in front of their friends. But as they gradually had become sufficiently used to doing the exercises and led by the teacher taking the lead in doing the exercises, their actions became less hesitant and their counting louder and more confident. In Singapore classrooms, and not just in music classes, students are generally more reticent and not very given expressing themselves, sometimes for fear of looking silly if they do not give the right answer and potentially earning a scolding from the teacher as a result. In music classes, other than not being very responsive when asked questions by the teacher, it also manifests in the form of students 'going through the motions'

when doing activities, e.g. appearing hesitant and doing activities with some reluctance. They can therefore be said to be very 'conscious' in this context. In the case of PS1 and 2, it was observed in both classes that the students generally performed with less inhibition than described above. In PS1, the singing was quite loud and clear, and the students even audibly made mistakes with the lyrics, but what was important was that they continued to sing with no let down in their commitment with no sign of awkwardness. In this regard, I would therefore argue that this was a manifestation of loss of self-consciousness.

7.3.7 ACTION-AWARENESS MERGING

The dimension of action-awareness merging is also not easily observable as it describes an abstract psychological state and is therefore not something that can clearly be described in the form of particular actions. Given the understanding this dimension refers to a state of high functionality when the person doing the activity operates in a kind of 'automatic' way due to skill level or confidence, I have interpreted observations in which students are able to multi-task a few different actions at the same time as manifestations of action-awareness merging. In this respect, action-awareness merging can be said to have been observed when the students in the PS2 lesson were performing their complex musical task as they were required to maintain an internal pulse while at the same time singing and throwing/catching or watching out for the ball that might come their way. At some point after going through a few rounds of trying out the activity and gaining more confidence in how to execute it, the students were able to assimilate the different elements inherent in the musical task and perform it to some level of success. This was particularly so towards the end of the activity after the teacher introduced the second ball and third ball, increasing the complexity of the task, but the students were generally able to rise to the challenge. For the PS1 lesson, some manifestation of action-awareness merging could be observed during the second activity in which the selected students were asked to perform a simple melody as a hand bell ensemble. This was a task of some complexity as they needed to keep the pulse of the music while listening out for their friends' playing, anticipating their part (each student had one hand bell) and playing the bell when it came to their part. As with the case for PS2, after a few practices as the students became more familiar with the task and confident about what they had to do, they were able to play the melody successfully. It has to be said that this was observed more clearly for the first group

of students selected as they were eventually able to play the melody quite fluently but less so for the second group, as their performance was more disjointed even after a few attempts.

7.3.8 SENSE OF CONTROL

In both lessons, there were instances when the students managed to continue performing the activity even when they made mistakes in the process. For PS1, this took place in the singing activity when the students clearly sang the lyrics and/or melody incorrectly but as a class, they were mostly able to continue singing, implying a certain measure of 'control' over the activity. During the hand bell activity, there was more noticeable hesitation even though the students were mostly able to play the melody together reflecting their unfamiliarity in this activity. For PS2, while there were many occasions when the students were not able to catch the ball, they nevertheless sought to retrieve it and continue without a break in the singing. What was important in both cases was that the students were able to continue and complete the activities in spite of their mistakes or uncertainty, implying that they were switched on and able to control the activity in spite of the challenges they faced.

In both classes, there were no clear observations of student autonomy though there was possibly limited instance for PS1. During the hand bell activity, once the teacher was satisfied that the students were able to play the simple melody, she allowed them to try it themselves, to varying degrees of success. For PS2, the teacher was in control of all the activities and the students' actions were very much determined by rules on how to carry them out as delineated by her.

7.3.9 Time transformation

There were not clear observations of time transformation in either lesson. The closest manifestation was during the PS1 lesson when the pre-dismissal bell rang and the teacher made a comment about having to complete the activity. At that point there was a slight buzz as the students geared up to try to complete the activity before the ringing of the dismissal bell, which seemed to suggest that the students may have felt that time had passed quickly and they were eager to complete the hand bell activity.

7.4 SECONDARY SCHOOL LESSONS – GENERAL THEMATIC ANALYSIS

The key themes that emerged from the observations of the secondary school lessons were as follows:

- Teacher-centricity
- Student engagement
- Enjoyment

Both lessons from SS2 and SS3 were single period lessons lasting 30 minutes. The SS2 lesson was conducted by the music teacher, assisted by an associate teacher known in Singapore as an allied educator, involving the teaching of a Singapore pop song. Allied educators are untrained teaching associates who are assigned to support teachers in the classroom though they may not themselves do the teaching. In the SS3 lesson, the teacher was at the start of a series of lessons teaching the students how to play the guitar, though the lesson itself was still at the theoretical stage and did not involve any guitar playing by the students. The lesson was taught not by a music teacher from the school, but a guitar instructor hired by the school for the purpose of conducting these guitar lessons within the regular music classes. While the teacher was actually present in the music room, she took no part in the teaching of the lesson.

7.4.1 TEACHER-CENTRICITY

Both classes were characterised by teacher involvement in almost all aspects of the lessons. For SS3, the teacher dominated every aspect of the lesson: he was observed being involved in didactic teaching throughout the lesson (lecturing the students on guitar technique), doing musical demonstrations on the guitar e.g. around 3:00-5:00], cracking jokes [e.g. around 9:00-10:00], and taking students to task for not following instructions [0:00-1:00]. Other than a few attempts to ask the students questions (which answers could be found in their handouts), the students were not asked to do any musical tasks or activities. It was arguable that as this was one of the early lessons in the series on guitar playing, a more directive approach was justifiable; nevertheless, the extent to which the lesson centred almost entirely on the teacher and involved no guitar playing by the students was difficult to comprehend. In comparison, while the teachers in SS2 also dominated their lesson, they did appear to make more effort to engage the students, such as giving them a quiz on the lyrics [5:00-6:00], going through the song lyrics [6:00-7:00], integrating a clapping activity into the singing [9:00-15:00] and getting them to sing. However, the

students did not always appear to respond to the teachers' cues, resulting in the teachers having to lead in the singing and continually encourage them to try to sing.

7.4.2 STUDENT ENGAGEMENT

There was an observed general lack of student engagement in both lessons, though in different ways for each class. For SS3, the lesson appeared to be designed to take advantage of the teacher's knowledge and skills in guitar playing, and he took centre stage in all aspects of the lesson, as already noted before. It could be that he felt a teacher-centric mix of guitar playing theory and demonstrations was the most efficient way to teach a class of 40 students how to play the guitar in the short amount of time allocated, though it must be again stated that the students were not actually issued with any guitars to try out whatever techniques or chords they were going through. It should be further noted that the 'teacher' in this case was not a trained school teacher who had gone through teacher training and certification at the National Institute of Education (Singapore's only higher institution for teacher training) and was hence not versed in the student-centric pedagogies or classroom strategies that a trained teacher in Singapore might be more familiar with. In spite of that, the teacher appeared to have been successful in capturing the attention and keeping the discipline of the class and the students were observed to be paying attention to the teacher; there were no observed instances of students being distracted or talking among themselves. Nevertheless, the students in SS3 were not observed to be engaged in any meaningful music-making activity throughout the duration of the lesson.

For SS2, while it was clear that the teachers had taken the time and effort to prepare the singing lesson, which included segments for student activities, they did not appear totally successful in engaging the students. While some students were observed to be paying attention and making some attempt to take part in the activities, especially during the quiz [5:00-6:00] and the clapping activity [9:00-15:00]. There was also an attempt to get the students to give their musical opinion on whether any song they knew could also 'fit' the rhythm they had clapped [16:00-19:00], which did get the class somewhat interested as they were hearing from one of their own and a song they were familiar with. However, most appeared to get easily distracted by things happening around the classroom or were not very focused on what was happening, e.g. there was a student who was constantly fiddling with his pen [e.g. at 1:00-2:00], some students got distracted at the end of the clapping

activity when they started talking and had to be shushed [15:00-16:00] by their friends, and also between activities [20:00-21:00]. During the clapping activity, there also appeared to be students who were not attempting to follow the rhythm provided by the teacher but were clapping their own rhythms [17:00-18:00]. While there were periods of time when the students seemed focused on what was happening, these were neither frequent nor sustained. In general, the students did not appear to be very interested in what was being taught, which might explain their unresponsiveness to the teachers. A possible reason for the lacklustre singing could be that, despite the teacher-centric approach, the teachers did not appear to have ensured that the students were familiar with the melody before getting them to sing the song, resulting in the uncertain singing despite their best efforts.

7.4.3 ENJOYMENT

The students in both classes did not appear to derive very much enjoyment out of their music activities. While there was a certain amount of laughter during the lessons, this was more due to students laughing at jokes made by the teachers, or funny things happening than because of their enjoyment of any musical activities. This was especially so for SS3, given that the lesson did not require the students to do anything more than sit at their places and listen to the teacher, though they did appear to enjoy his jokes and demonstrations of guitar playing [e.g., 9:00-10:00, 22:00-23:00]. None of this, however, had much to do with musical activities or learning. For SS2, much of the enjoyment was due to the students clapping and cheering in encouragement when their classmates got directly involved in the music lessons when answering questions [5:00-6:00, 16:00-17:00]. Though there were episodic signs of student enjoyment during the singing activities, intimated by their general willingness to participate in the activities, there was nevertheless a palpable sense of reluctance to express themselves fully that detracted from that sense of enjoyment. An alternative perspective based on my understanding of the Singapore classroom context would be that, given this was class comprising students of less academically inclined who generally tend to be more easily distracted, the level of participation observed could already be considered as being at a satisfactory level.

7.5 SECONDARY SCHOOL LESSONS – OBSERVATIONS OF FLOW

7.5.1 CONCENTRATION

As with the primary school lessons, there were also clear elements of the dimension of concentration in the secondary school lessons. In SS3, this could be explicitly observed: the students were not talking or disrupting the lesson and were looking intently at the teacher as he explained and demonstrated the finer points of guitar playing. It was perhaps noteworthy that this lesson was without question the most teacher-centric of all the four lessons from both the primary and secondary schools. The teacher spoke non-stop for almost the entire 30-minute duration of the lesson, rarely asking the students any questions, but managed to capture the attention of the students through a combination of exaggerating his actions in an amusing way that relied on the use of local slang and Singlish that the students appeared to enjoy [5:00-6:00], exaggerating his actions [20:00-21:00], and cracking banal jokes [22:00-23:00], interspersed with skilful playing demonstrations on the guitar [6:00-8:00]. It should be noted that he, being a freelance instructor hired by the school to conduct the guitar classes, was also the only teacher in the four observed lessons who was leading the teaching but had not undergone teacher training (the allied educator in SS2 was supporting, not leading the teaching).

The situation in SS2 was a little different. While most students were generally paying attention to the teachers, there were some who were not and there were also observable instances of disruptions during the lesson. E.g., throughout the lesson, a student could be seen fiddling with a pen, often dropping it on the floor and causing crashing noises [e.g., at 2:00-3:00]. Students were also clearly seen talking among themselves at various points during the lesson [e.g. at 19:00-21:00] and there was the occasional loud squeal from a student that distracted the others [8:00-9:00].

It was noted that in both lessons, the activities in which the students' concentration levels were high were during demonstrations and when they were actively engaged in musical activities. In SS2, these were when the teachers were demonstrating the song *Bunga Sayang*, when the students were being shown a video of a performance of the song [21:00-24:00] and when the students were doing the clapping activity. For SS3, this was whenever the teacher did his guitar-playing demonstrations.

7.5.2 UNAMBIGUOUS FEEDBACK

There did not appear to be many instances of the teachers in either class providing unambiguous feedback to the students on their performance of the respective musical tasks. For SS2, the students' singing was generally subdued and not very clear, needing the teachers to lead them before making an effort to sing. In spite of that, no feedback was provided to the students on their performance as the teachers continued with the lesson. As the SS3 lesson in question was still at the early stage of a series of classes covering the theory of guitar playing, there were no musical tasks set for the students; the lesson was conducted lecture-style and no instruments were handed to the students. The only instances of feedback provided were when the teacher expressed approval when he asked the students a few general questions about guitar playing, which they responded to correctly by referring to their handouts.

7.5.3 CLEAR GOALS

In both classes, the lesson objectives were simple and clear enough: for SS2, it was to learn a new song while for SS3, it was about learning to play the guitar. In the former case, the teachers set out the lesson objectives very clearly at the start of the lesson: to learn to sing *Bunga Sayang* and familiarise students to local pop music. Throughout the lesson, there were also a few micro-activities, such as a quiz and viewing of a video, and the objectives were mostly made clear, with the exception of a clapping activity, which started without any explanation as to its nature. The objectives for this were not explained or apparent until the end of the activity when the students sang the song with the clapping and the teachers told them it was meant to embellish the singing.

7.5.4 CHALLENGE-SKILL BALANCE

The classes' respective musical activities would not, on paper, appear to pose too much challenge to the students: the lesson for SS2 was essentially a sing along session, with some elements of musical appreciation added, while the SS3 lesson covered a basic theory class on guitar playing. As such, the students from SS2 did not appear to be particularly engaged throughout the lesson, evidenced by the singing of the students, which was not particularly loud, given there were more than 30 students – the two teachers sang louder than all the students combined – and the words could not be clearly made out. The teachers did consider challenge-skill

balance when they conducted a clapping activity [12:00-15:00] to complement the singing of the song. For this, they firstly started with by introducing a simple rhythm which they got the students to follow before gradually progressing to more complex ones, and then finally getting the students to sing the song along to the clapping 'accompaniment'. The students could be observed struggling to figure out the rhythmic patterns as the teachers introduced them but as they practised they visibly grew in confidence and were finally able to clap and sing the song at the same time somewhat accurately. For SS3, while the students did appear more engaged, this was perhaps more due to them finding the instructor's antics interesting rather than the actual lesson itself, which lacked any activity on the part of the students. All this would appear to suggest that for both classes, the level of challenge of the activities was below that of the students' ability, which resulted in the students generally being in a state characterised by Csikszentmihalyi as 'boredom'.

7.5.5 AUTOTELIC EXPERIENCE

The dimension of autotelic experience was most strongly observed during the secondary school lessons after the students finished watching the teachers' musical demonstrations. For example, for SS2 the students clapped enthusiastically after the teachers' demonstration of *Bunga Sayang*, and for SS3, the students were also seen to enjoy the instructor's short guitar performances. The students from SS2 were also seen to somewhat enjoy taking part in the singing of *Bunga Sayang* after they became more familiar with the song and were able to express themselves better (in spite of their weak singing in general), e.g. at 8:00-9:00. In addition, they also seemed to perk up whenever their friends were able to answer the teachers' questions correctly, rewarding them with generous applause, e.g. at 5:00-6:00, when a student correctly filled in part of the song's lyrics at the whiteboard. Meanwhile, the students from SS3 appeared to enjoy the jokes cracked by the teacher: the 'jokes' or jocular antics he employed were often greeted by guffaws and chuckles and generally helped to sustain student interest in a highly teacher-centric class [e.g., 9:00-10:00, 22:00-23:00]. It should be noted that the positive reactions to the teacher's 'jokes' were borne more of amusement rather than humour.

7.5.6 LOSS OF SELF-CONSCIOUSNESS

The two classes were notable for a lack of loss of consciousness observed. The closest the students came to demonstrating it was when they generously

applauded or even cheered the teachers' musical demonstrations, and for SS2, when their friends answered the teacher's questions correctly. In neither case were these reactions related to the students' actual participation in the musical activities.

7.5.7 ACTION-AWARENESS MERGING

Due to a complete lack of student activity, there were no instances of the dimension of action-awareness merging observed for the SS3 lesson. One possible occasion of action-awareness merging in the SS2 lesson took place during the clapping activity introduced by the teachers [from 12:00-15:00]. As noted earlier, the students began with a sense of uncertainty as they were initially not sure what the point of the activity was. As the activity progressed and the students gained confidence through repeatedly practising the clapping rhythms, they became increasingly absorbed in the task, there was a greater fluency in their actions. Towards the end of the activity, at least some of the students were observed to be able to clap the rhythms and sing the song at the same time.

7.5.8 SENSE OF CONTROL

There was no manifestation of the dimension of sense of control in the SS3 lesson, again due to the lack of activity for the students. Sense of control could have been observed in the SS2 lesson during the clapping and singing activity, as some students, while uncertain of the rhythmic clapping patters, were able to quickly 'recover' during the singing and clapping to rejoin and catch up with their classmates in the activity despite having initially lost its pulse.

7.5.9 TIME TRANSFORMATION

In neither class was the dimension of time transformation observed; there was no noticeable reaction from the students of either class to suggest so when their respective lessons ended.

7.6 CONCLUSIONS

Table 7.1 summarises the overall findings of the video observations.

Table 7.1: Video observation flow manifestation summary

Flow dimension	PS1	PS2	SS2	SS3
Challenge-skill balance	Yes	Yes	Yes	Yes
Clear goals	Yes	Yes	Yes	Yes
Unambiguous feedback	Yes	Yes	Not observed	Not observed
Concentration	Yes	Yes	Yes	Yes
Sense of control	Yes	Yes	Yes	Not observed
Action-awareness merging	Yes	Yes	Not observed	Not observed
Loss of self-consciousness	Yes	Yes	Not observed	Not observed
Time transformation	Yes	Not observed	Not observed	Not observed
Autotelic experience	Yes	Yes	Yes	Yes

Based on the flow dimensions manifested, it would appear that the flow experiences for the primary school students were observed to be more fully realised than for the secondary school students, in the sense that more flow dimensions were observed in the primary school than for the secondary school classrooms. This was perhaps a reflection of findings from literature that younger students tend to experience flow more (Custodero, 2005).

CHAPTER 8 – FACTOR ANALYSIS

8.1 INTRODUCTION

This chapter discusses the findings from the exploratory factor analysis (EFA) conducted on the data. The analyses were conducted on the primary (PS) and secondary school (SS) cohorts separately and then on both samples as a whole (CS). Each analysis will be dealt with separately.

EFA is used to reduce the number of variables to a more parsimonious set by clustering variables that have a close relationship (Leech, Barrett, & Morgan, 2015). EFA was used in this study as a means of better understanding the nature of the flow experience of students in the music classroom. While it has well been established that there are nine dimensions (factors) to the flow experience, EFA was used rather than confirmatory factor analysis as it was not the intention of this study to either cast doubt on or affirm the existing construct of flow. Rather, this study adopted an open-minded mentality aimed at exploring the dynamics of the flow dimensions in the students' experiences, especially how or whether the dimensions mapped back to the 'original' nine, and how they interacted with one another. As noted in the literature review, there had been some questions raised about whether all nine dimensions had to be present to constitute flow, so this analysis also hoped to examine if this was the case for the Singaporean students in the music classroom. The EFA was therefore conducted with the aforementioned parameters in mind.

8.2 ANALYSIS OF PRIMARY SCHOOL COHORT

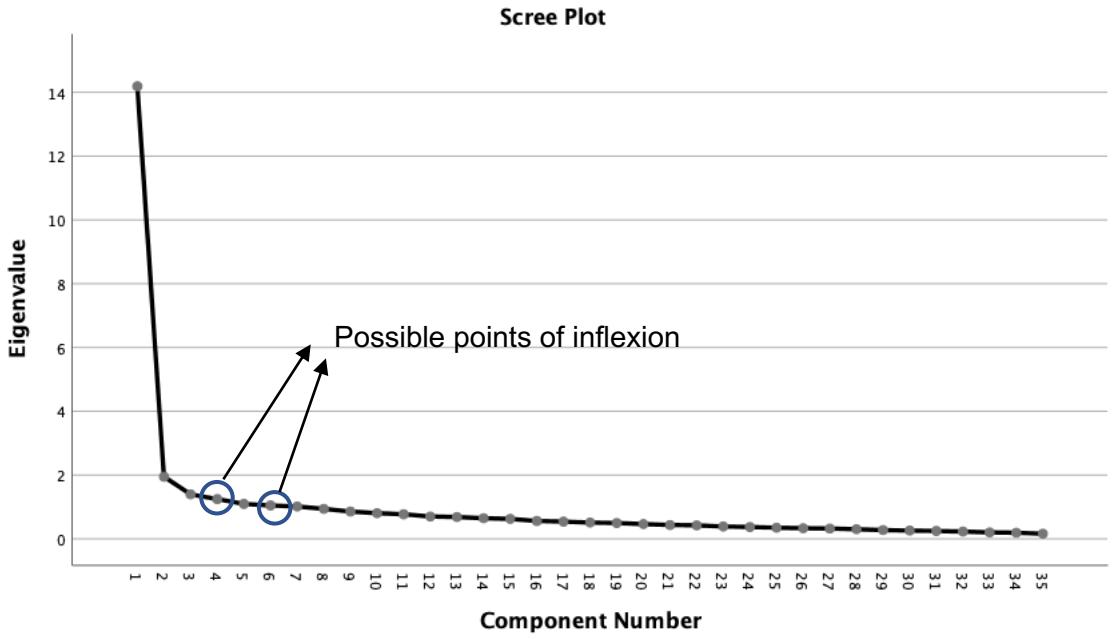
EFA was conducted on the data from the 35 items gathered from the PS students. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was applied to the PS sample (N = 270) to test if the sample was large enough for factor analysis, with a statistic of >.5 being regarded as the threshold for adequacy. The analysis revealed that the KMO = .945, well above the recommended value of .5, verifying the adequacy for the PS sample size.

Principal component analysis was used as the method of extraction and the outcome is set out in Appendix 7. Rotation is commonly carried out on the factors extracted in EFA to get a better spread of variables and avoid most of them falling onto the first factor. Orthogonal rotation was used rather than oblique rotation as the former allows the factors to remain independent of one another, which for this study is more relevant, as it has been established that there are nine distinct dimensions in

the flow experience (Field, 2013). Varimax rotation, a form of orthogonal rotation, was used to bring out a maximum spread of factor loadings within each factor, and the factor scores were calculated using the Anderson-Rubin method to maintain a consistent approach in ensuring factor independence.

The most common threshold for factor extraction is set at an Eigenvalue of 1 or .7 (Field, 2013; Leech et al., 2015): for the former, seven factors were extracted while for the latter, 12 were extracted. As a guide, it has been recommended that factor extraction using an Eigenvalue of 1 as the threshold can be used when there are 30 factors or less, while the value of .7 can be used for sample sizes of more than 300 (Field, 2013). In this case, there were a total of 35 factors and sample size of 270. Taking additional reference from the scree plot derived from the data, two possible points of inflexion were at factor 3 and 5, with the graph tapering off from there, implying that the data could either yield a two- or four-factor solution (see Table 8.1). Given the above considerations, two- or four-factor solutions carried a risk of under-reporting the number of factors and were rejected, while a 12-factor solution was also not taken up as there was a likelihood of over-reporting (see Stellefson & Hanik, 2008 on the dangers of over- and under-reporting of factors in EFA). As such, a seven-factor solution was decided on. These decisions were also influenced by two other considerations: firstly, flow was a phenomenon that research has established to have nine dimensions (factors) and the questionnaire was designed to reflect that so it could be said that the EFA could have been 'expected' to yield around nine factors (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Secondly, Csikszentmihalyi himself had more recently commented that some of the dimensions of the actual flow experience (loss of self-consciousness, action-awareness merging, time transformation, sense of control) might be manifestations of the dimension of concentration (Beard, 2015). This would appear to suggest the possibility of these five dimensions being 'merged' into fewer ones; this is the frame from which the factor analysis was conducted.

Table 8.1: Scree plot for PS data factor analysis



The seven factors with Eigenvalues > 1 explained a combined 62.657% of all variance.

Table 8.2: PS data rotated component matrix

Rotated Component Matrix

	Component						
	1	2	3	4	5	6	7
13. Taking part in music activities leaves me feeling great.	.763						
11. I enjoy learning at music class.	.747						
27. It feels like time flies during music class.	.736						
12. I love the feeling I get after music class and want to capture it again.	.731						
16. Music classes are not boring.	.720			.361			
26. I am so absorbed in the activities in music class that I do not realise time has passed.	.691						
15. 1 find what I learn in music class interesting.	.655			.403			
14. Overall I find taking part in music class an extremely rewarding experience.	.641						
31. I have a feeling of control when participating in musical activities.	.440	.422	.312				
5. I know what I want to achieve out of music class.	.420		.300	.414			

20. During music class, I am totally focused on the music making experience.	.351		.323	.326			.348
10. It is always clear to me when I am doing well in music class.		.618					
1. I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.	.352	.573					
9. I can tell how well I am doing during music class.		.572		.356			
2. I would be able to do more difficult topics than what is taught in music class.		.570					.404
28. During musical activities in class, I play/sing the correct notes without hesitation.		.536			.307	.432	
29. During musical activities, I feel in total control of what I am doing.		.527					
4. My abilities match the difficulty of what we do in music class.		.507					
6.Clear targets are set for us in music class.	.332	.349					-.314
23. I am good at exchanging ideas with my classmates and doing group work in music class.			.762				
22. When I need help I ask the teacher.			.696				
25. I work with classmates to cope with tasks or projects required by the music course.			.683				
24. When the teacher or another classmate asks a question that I know the answer to, I will say so and respond		.324	.650				
7. I know clearly what is expected of me in music class.				.654			
8. During music class I have a strong sense of what I want to do.		.388		.600			
3. I feel I have the knowledge needed to understand what is taught in music class.	.300			.555			
30. I feel I can control what I am doing in music class.		.403		.452		.308	
33. During musical activities, I am not concerned with how I present myself.					.815		
32. During musical activities, I am not concerned with what others may have been thinking of me.	.303				.683		

34. During musical activities, I do things automatically without having to think.		.414			.575		
35. During music class, I am not worried about how well I do as long as I know I am doing my best.				.362	.423		
17. During music class I am not distracted.						.826	
19. During music class, I focus on the activities and do not do other things that have nothing to do with the class.				.342		.417	.412
18. When someone disturbs the music class I am not happy.							.699
21. When listening to the music teacher, I am so interested that I am unaware of what is going on around me that is not related to the music class.	.338		.307		.307		.436

The rotated factor loadings for the PS data based on the seven-factor solution are at Table 8.2, in which factor loadings of more than .3 are reflected. In the process of analysing the factors, while all the variables were given due consideration, I gave greater weight to variables with 'higher' loadings of >.5 or more as a means of determining its (their) prominence within a factor, while those <.5 were considered as 'lower' loadings (Leech et al., 2015).

Primary Schools Factor 1 (PF1) had an Eigenvalue of 6.02[6] accounting for 17.199% of total variance, had eight items with higher factor loadings of between .641 to .763. These covered the flow dimensions of autotelic experience (variables 11, 12, 13, 14, 15, 16) and time transformation (26 and 27). Another eight variables loaded with lower scores of .44 or less, covering the dimensions of challenge-skill balance (1, 3), clear goals (5, 6), concentration (20, 21), sense of control (31) and loss of self-consciousness (32). All six items for autotelic experience and two items for time transformation loaded highly in PF1, which would appear to suggest that the two dimensions were closely linked in the flow experience, that enjoyment of musical activities was accompanied by a sense of time slowing or passing quickly. It was also noteworthy that the two variables representing time transformation loaded exclusively onto PF1, meaning that it probably did not interact meaningfully with the other factors. That said, the close connections between the various dimensions in

6. All Eigenvalues cited are based on rotated values.

the flow experience could also be seen here, with manifestations of four others present, though the loadings of these variables were lower. However, that there was a clear gap (.201) between autotelic experience and time transformation from the others would appear to suggest the relative primacy of two most prominent dimensions in this factor. PF1 is therefore named ‘absorbed enjoyment’.

PF2 had an Eigenvalue of 3.846 accounting for 10.99% of total variance, had 13 variables with factor loadings ranging from .324 to .618, manifesting the dimensions of clear goals (6, 8, 24), challenge-skill balance (1, 2, 4), sense of control (29, 30, 31), action-awareness merging (28, 34) and unambiguous feedback (9, 10). For PF2, what was noteworthy was that the 3 dimensions that are thought of as flow precedents (challenge-skill balance, clear goals and unambiguous feedback) all featured prominently here. This would suggest that the primary school students may have perceived the three flow precedents as one manifestation. PF2 also had elements of sense of control and action-awareness merging though the fairly narrow range of loadings for all 13 variables (.294) could indicate that none of the dimensions were particularly prominent. Given that the three flow precedents stood out for PF2, it was named ‘flow preparation’.

PF3 had an Eigenvalue of 3.128 and variance of 8.937%. Four variables had higher loadings ranging from .65 to .762, while four other variables had lower factor loadings ranging from .3 to .323. These manifested the dimensions of clear goals (5, 24, 25), unambiguous feedback (22, 23), concentration (20, 21) and sense of control (31). With a clear gap between the factor loadings of clear goals (except 5 with a loading of .3) and unambiguous feedback, these two dimensions would appear to be the most prevalent for PF3. Variables 22, 23, 24 and 25 also did not load onto any of the other factors (except 24, which had a lower loading of .324 for PF2), which meant that clear goals and unambiguous feedback were most strongly represented here. Collectively, the items conveyed a sense of the students working together, helping one another and consulting the teacher when needed. E.g., variable 23, “I am good at exchanging ideas with my classmates and doing group work in music class”, and variable 25, “When the teacher or another classmate asks a question that I know the answer to, I will say so and respond”. PF3 was therefore named ‘co-operation and communication’.

PF4 had an Eigenvalue of 3.024 and variance of 8.641%. Eleven variables with factor loadings ranging from .326 to .654, accounted for the dimensions of clear goals (5, 7, 8), autotelic experience (15, 16), concentration (19, 20), challenge-skill

balance (3), sense of control (30), loss of self-consciousness (35) and unambiguous feedback (9). Seven dimensions manifested in PF4, the most of any factor, and the narrowness of the range of the loadings (.328) of all the variables would suggest that none of the dimensions were particularly prominent, though clear goals had a total of three variables and two with higher loadings (7, 8). Given the abundance of dimensions loaded here with none being truly dominant, PF4 was named 'the holistic flow experience'.

PF5 had an Eigenvalue of 2.464 and variance of 7.04%. Six variables with factor loadings ranging from .307 to .815 accounted for the dimensions of loss of self-consciousness (32, 33, 35), action-awareness merging (28, 34) and concentration (21). Loss of self-consciousness was the most prominent dimension here, with two of three variables having high loadings (32, 33). Action-awareness merging also had a variable with high loading (34). As five of the six variables here accounted for these two dimensions, PF5 was named 'unconscious action'.

PF6 had an Eigenvalue of 1.748 which accounted for variance of 4.994%. Four variables with factor loadings ranging from .308 to .826 manifested the dimensions of concentration (17, 19), action-awareness merging (28) and sense of control (30). With four variables, the lowest of the seven factors, PF6 would appear to be 'weaker' compared to the other factors. This was further reinforced by only one variable (17) loading highly at .826 (though it was noteworthy that this was the highest loaded variable in the all the factors) with the rest loading much lower at .307 to .432. With concentration being the most heavily loaded dimension, albeit not very strongly, and the others being not prominent as well, this factor was named 'weak concentration'.

PF7 had an Eigenvalue of 1.7 accounting for 4.856% variance. Six variables with factor loadings ranging from .314 to .699 reflected the dimensions of concentration (18, 19, 20, 21), challenge-skill balance (2) and clear goals (6). The dimension of concentration loaded prominently in PF7 as well, though the variable loadings were also not very strong (18 at .699, the rest from .348 to .436). The other two dimensions also did not load strongly and it was noted that clear goals had a negative loading, the only variable that did so in the PS dataset. PF7 was named 'diffused concentration'.

8.2.1 DISCUSSION OF PRIMARY SCHOOL COHORT FACTOR LOADINGS

Based on the loadings of the variables derived from their respective flow dimensions within each factor, it was arguable that particular dimensions of the flow experience manifested clearly in six of the six factors: PF1 mapped to autotelic experience and time transformation, PF2 to clear goals, challenge-skill balance and unambiguous feedback, PF3 to clear goals and unambiguous feedback, PF5 to loss of self-consciousness and action-awareness merging, PF6 to concentration (albeit not strongly) and PF7 again to concentration. No dimension loaded particularly significantly on PF4. Out of the nine flow dimensions, the only one that did not appear to feature prominently in any of the seven factors was sense of control. Its strongest manifestation was in PF2 with 3 variables: one loading relatively highly (.527) and the other two relatively lowly (.422 and .403). On the other hand, the following dimensions featured prominently in two factors: clear goals (PF2 and 3), unambiguous feedback (PF2 and 3) and concentration (PF 6 and 7).

As the Eigenvalues give weight to each factor's variance in relation to the overall model, it is instructive to analyse the order of the factors and their corresponding flow dimensions. That autotelic experience and time transformation both featured prominently in PF1 would appear to suggest that these two dimensions were most central to the students' flow experiences. It was also noteworthy that the flow precedents (challenge-skill balance, clear goals and unambiguous feedback) featured strongly in PF2 and PF3. It could perhaps then be inferred that having suitable precedents was an important consideration in bringing about the flow experience and that flow in the classroom was something that could be facilitated through thoughtful lesson planning and appropriate feedback provided during the lesson. Action-awareness merging and loss of self-consciousness manifesting strongly in PF5 could mean that when actions became 'automatic' during flow, a natural consequence was that the student also became less concerned about how he was perceived by others and acted more freely. Concentration played a key role, albeit in the last two factors PF6 and 7, which could suggest that while concentration was pervasive in the flow experience, it has nevertheless not been perceived to be the most prominent among the nine dimensions.

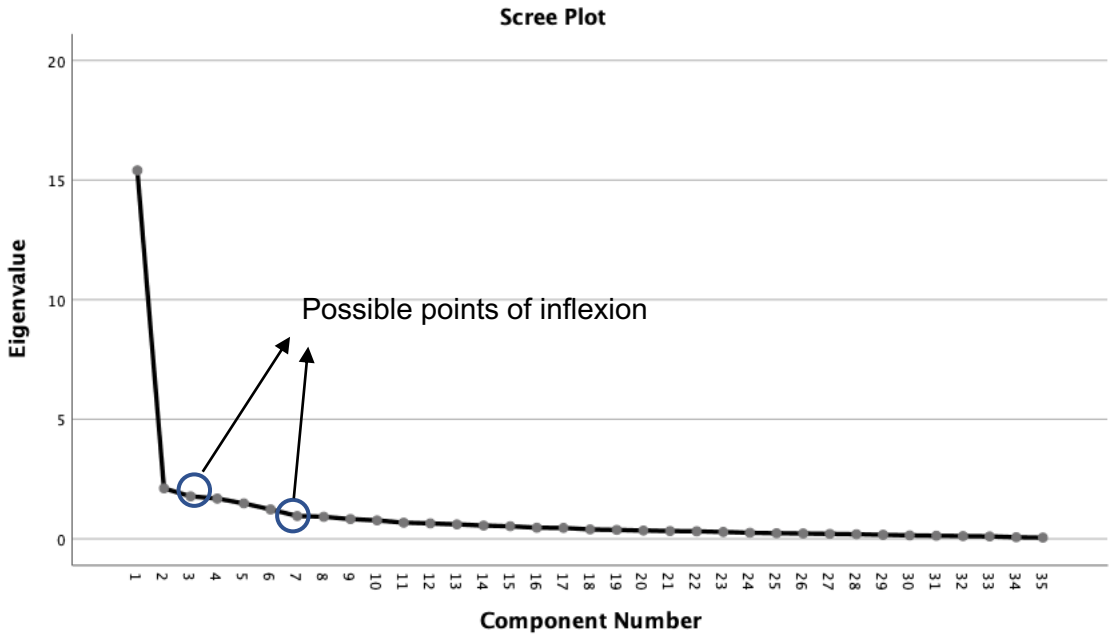
8.3 ANALYSIS OF SECONDARY SCHOOL COHORT

Exploratory factor analysis was conducted on the data from the 35 items gathered from the SS students with oblique rotation. The Kaiser-Meyer-Olkin (KMO)

measure of sampling adequacy was applied to the SS sample (N = 94) to test for sampling adequacy. The analysis revealed that KMO = .880, above the recommended value of .5, verifying the adequacy for the SS sample.

Principal component analysis was used as the method of extraction with varimax rotation and the outcome for the SS dataset is set out in Appendix 8. Using an Eigenvalue threshold of 1, as already set out in the analysis for the primary school dataset, six factors were extracted. The scree plot for the SS dataset was also referred to (Table 8.3) to check the viability of a six-factor solution:

Table 8.3: Scree plot for SS data factor analysis



From the scree plot, two possible points of inflexion were identified, yielding either a two- or six-factor solution. A six-factor solution was adopted as it was consistent with the outcome of the Eigenvalue extraction value of >1 and also to avoid under-reporting of factors. Based on Appendix 8, the six factors accounted for a total variance of 67.667%.

Table 8.4: SS data rotated component matrix

Rotated Component Matrix

	Component					
	1	2	3	4	5	6
12. I love the feeling I get after music class and want to capture it again.	.721	.316			.309	
13. Taking part in music activities leaves me feeling great.	.709	.300	.351			

14. Overall I find taking part in music class an extremely rewarding experience.	.685					
11. I enjoy learning at music class.	.667					.445
26. I am so absorbed in the activities in music class that I do not realise time has passed.	.631		.427			
27. It feels like time flies during music class.	.618		.356			
15. 1 find what I learn in music class interesting.	.539		.315			.496
25. I work with classmates to cope with tasks or projects required by the music course.	.513				.379	
2. I would be able to do more difficult topics than what is taught in music class.		.818				
4. My abilities match the difficulty of what we do in music class.		.739				
3. I feel I have the knowledge needed to understand what is taught in music class.		.671				.324
8. During music class I have a strong sense of what I want to do.		.667	.346			
1. I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.		.582				
9. I can tell how well I am doing during music class.		.545	.365		.332	
10. It is always clear to me when I am doing well in music class.		.522		.423		
18. When someone disturbs the music class I am not happy.			.709			
19. During music class, I focus on the activities and do not do other things that have nothing to do with the class.			.689			.305
21. When listening to the music teacher, I am so interested that I am unaware of what is going on around me that is not related to the music class.			.623	.345		
29. During musical activities, I feel in total control of what I am doing.			.599	.319	.444	
20. During music class, I am totally focused on the music making experience.	.436		.541		.340	
30. I feel I can control what I am doing in music class.		.350	.417		.382	
5. I know what I want to achieve out of music class.		.395	.412		.323	.407

33. During musical activities, I am not concerned with how I present myself.				.764		
32. During musical activities, I am not concerned with what others may have been thinking of me.				.695		.315
35. During music class, I am not worried about how well I do as long as I know I am doing my best.	.392			.672		
34. During musical activities, I do things automatically without having to think.			.377	.672		
31. I have a feeling of control when participating in musical activities.	.384			.598		
28. During musical activities in class, I play/sing the correct notes without hesitation.			.383	.568	.385	
22. When I need help I ask the teacher.					.742	
23. I am good at exchanging ideas with my classmates and doing group work in music class.					.701	
24. When the teacher or another classmate asks a question that I know the answer to, I will say so and respond					.671	
7. I know clearly what is expected of me in music class.						.656
6.Clear targets are set for us in music class.				.311	.393	.645
16. Music classes are not boring.	.509		.312			.623
17. During music class I am not distracted.			.462			.527

The rotated factor loadings for the SS data based on the six-factor solution are at Table 8.4, in which factor loadings of more than .3 are reflected.

Secondary School Factor 1 (SF1) had an Eigenvalue of 4.998 accounting for total variance of 14.279%. Twelve variables with loadings ranging from .384 to .721 manifested the flow dimensions of autotelic experience (11, 12, 13, 14, 15, 16), time transformation (26, 27), clear goals (25), concentration (20), loss of self-consciousness (35) and sense of control (35). The variables for autotelic experience and time transformation all loaded highly in SS1 with loadings >.5 ranging from .509 to .721. This suggested that for the secondary school students, their experience of autotelic experience was closely intertwined with a sense of time transformation. In

this case however, the sole variable loaded here for clear goals also loaded quite highly (.513), while the other two present dimensions of loss of self-consciousness and sense of control both loaded lower (.384 to .436). It was also noteworthy that while the variables for time transformation did load onto another factor, these were on the lower side (.5). Given that the flow characteristics for SF1 were substantially similar to that for PF1 with autotelic experience and time transformation both loading prominently and highly, this factor was also named ‘absorbed enjoyment’.

SF2 had an Eigenvalue of 4.297 and variance of 12.278%. Eleven variables with factor loadings ranging from .3 to .818 reflected the dimensions of challenge-skill balance (1, 2, 3, 4), unambiguous feedback (9, 10), clear goals (5, 8), autotelic experience (12, 13) and sense of control (30). Almost all the variables for flow precedents of challenge-skill balance, clear goals and unambiguous feedback had higher loadings in SS2, ranging from .522 to .818, except for variable 5 for clear goals, which had a lower loading of .395. The loadings for the other two dimensions were lower, at .3 to .316, which would imply the supremacy of the three flow precedents in this factor. Therefore, similar to PF2, this factor was named ‘flow preparation’.

SF3 had an Eigenvalue of 4.182 accounting for variance of 11.95%. 17 variables with loadings ranging from .312 to .709 manifested the dimensions of concentration (17, 18, 19, 20, 21), autotelic experience (13, 15, 16), sense of control (29, 30), action-awareness merging (28, 34), clear goals (5, 8), time transformation (26, 27) and unambiguous feedback (9). It was noted that seven out of the nine flow dimensions were manifested in SF3, the highest number of all the secondary school factors. In this, there were some similarities with PF4, which also loaded seven out of nine dimensions, though only five dimensions overlapped in SF3 and PF4, with action-awareness merging and unambiguous feedback found in SF3 and clear goals and loss of self-consciousness in PF4. However, the dominant dimension for SF3 would appear to be concentration with four out of five variables loading highly between .541 to .709 and another loading somewhat lower at .462. This was in contrast with PF4, which had no particular dimension dominant. The rest of the dimensions present in SS3 also did not load particularly highly (.312 to .427), with the exception of variable 29 of sense of control, which loaded at .599. SF3 was therefore named ‘dominant concentration’.

SF4 had an Eigenvalue of 3.938 accounting for variance of 11.251%. 10 variables with loadings ranging from .311 to .764 manifested the dimensions of loss

of self-consciousness (32, 33, 35), action-awareness merging (28, 34), sense of control (29, 31), unambiguous feedback (10), concentration (21) and clear goals (6). There were high factor loadings for all the variables for loss of self-consciousness and unambiguous feedback of .568 to .764, while one variable for sense of control (31) also loaded highly (.598), though the other variable (29) loaded lowly at .319. The variables for the other dimensions had lower loadings ranging from .311 to .432. As such, SF4 bore considerable resemblance to PF5, with loss of self-consciousness and action-awareness merging both dominant here and was similarly named ‘unconscious action’.

SF5 had an Eigenvalue of 3.28 accounting for variance of 9.371%. 12 variables with loadings ranging from .309 to .742 reflected the dimensions of clear goals (5, 6, 24, 25), unambiguous feedback (2, 22, 23), sense of control (29, 30), action-awareness merging (28), concentration (20) and autotelic experience (12). A substantial number of the dimensions (6 out of 9) also loaded onto SF5, and of those only two of the variables for unambiguous feedback (22, 23) and one for clear goals (24) loaded higher (.671 to .742), while the rest had lower loadings ranging from .309 to .444. Given that there was a gap between the high loadings for unambiguous feedback compared to the other dimensions (apart from the one variable for clear goals), it was arguable that unambiguous feedback was the dominant dimension for SF5, with some element of clear goals. SF5 was therefore named ‘guided feedback’.

SF6 had an Eigenvalue of 2.988 accounting for variance of 8.538%. Ten variables with loadings ranging from .305 to .656 reflected the dimensions of autotelic experience (11, 15, 16), clear goals (5, 6, 7), concentration (17, 19), challenge-skill balance (3) and loss of self-consciousness (32). The variables with the highest loadings were for clear goals (6, 7), autotelic experience (16) and concentration (17). While the other variables loaded lower (<.5), variable 15 had a relatively higher loading of .496, which would seem to give autotelic experience more prominence in SF6, together with clear goals. While variable 17 for concentration also had a high loading of .527, its other variable (19) loading was somewhat low at .305. SF6 was therefore named ‘guided enjoyment’.

8.3.1 Discussion of secondary school cohort factor loadings

Based on the factor loadings, it could be said that eight of the nine flow dimensions mapped strongly onto the six factors, indicating their influence in the students’ experiences: autotelic experience and time transformation mapped onto

SF1; challenge-skill balance, clear goals and unambiguous feedback onto SF2 ; concentration onto SF3; action-awareness merging and loss of self-consciousness onto SF4; unambiguous feedback onto SF5; and autotelic experience and clear goals onto SF6. As with the primary schools, sense of control did not prominently map into any of the secondary school factors. Some of the secondary school factors had similar characteristics with other primary school factors: strong factor loadings to similar flow dimensions were found in SF1 and PF1 (autotelic experience and time transformation or 'absorbed enjoyment'), SF2 and PF2 (challenge-skill balance, clear goals and unambiguous feedback or 'flow preparation') and SF4 and PF5 (action-awareness merging and loss of self-consciousness or 'unconscious action'). While SF3 and PF4 mapped to five similar dimensions out of seven, they nevertheless appeared to share some similarity in having a large number of the flow dimensions manifested, though SF3 did have a prominent dimension in concentration.

Examining the order of secondary school factors based on their Eigenvalues, there were also some similarities with the primary school factors. Like the latter, SF1 and SF2, had the highest Eigenvalues and strongly manifested the dimensions of autotelic experience, time transformation (SF1), and challenge-skill balance, clear goals and unambiguous feedback (SF2). It was therefore arguable that the flow experiences for both secondary school students had strong elements of the aforementioned five dimensions. The dimensions of unambiguous feedback and clear goals also loaded higher in SF5 without challenge-skill balance. This would also appear to suggest that these two dimensions were somehow more prominent among the three flow precedents, possibly implying that for the secondary school students, having clearly articulated goals and feedback during the lesson was more important than the relative difficulty level of the task. It could also be noted that autotelic experience and clear goals also had relatively high loadings in SF6, though SF6 had the lowest Eigenvalue among the 6 factors.

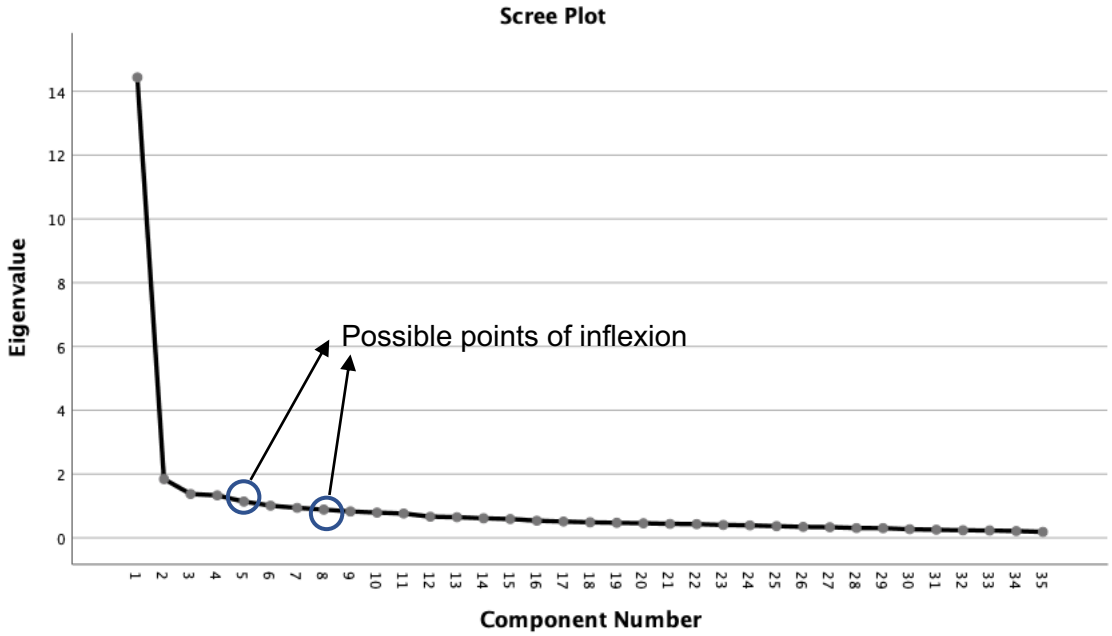
8.4 ANALYSIS OF COMBINED PRIMARY AND SECONDARY SCHOOL COHORT DATA

Exploratory factor analysis was conducted on the data from the 35 items gathered from the combined data with oblique rotation. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was applied to the combined sample (N = 364) to test for sampling adequacy and the analysis revealed that KMO = .944,

above the recommended value of .5, verifying the adequacy of the combined sample.

Principal component analysis was used as the method of extraction with varimax rotation and the outcome for the combined dataset is set out in Appendix 9. Using an Eigenvalue threshold of 1, as already set out in the analysis for the primary school dataset, six factors were extracted. The scree plot for the combined dataset was also referred to (ref. Table 8.5) to check the viability of a six-factor solution:

Table 8.5: Scree plot for combined data factor analysis



From the scree plot, two possible points of inflexion were identified, yielding either a three- or six-factor solution. A six-factor solution was adopted as it was consistent with the outcome of the Eigenvalue extraction value of >1 and also to avoid under-reporting of factors. Based on Appendix 9, the six factors accounted for a total variance of 60.364%.

Table 8.6: Combined cohort data rotated component matrix

Rotated Component Matrix

	Component					
	1	2	3	4	5	6
13. Taking part in music activities leaves me feeling great.	.756					
12. I love the feeling I get after music class and want to capture it again.	.750	.314				

11. I enjoy learning at music class.	.748					
16. Music classes are not boring.	.700					.377
27. It feels like time flies during music class.	.697					
26. I am so absorbed in the activities in music class that I do not realise time has passed.	.675					
14. Overall I find taking part in music class an extremely rewarding experience.	.655					
15. 1 find what I learn in music class interesting.	.653					.382
20. During music class, I am totally focused on the music making experience.	.407		.366		.404	
5. I know what I want to achieve out of music class.	.378	.314	.338			.339
2. I would be able to do more difficult topics than what is taught in music class.		.713				
4. My abilities match the difficulty of what we do in music class.		.609				
8. During music class I have a strong sense of what I want to do.	.343	.599				
9. I can tell how well I am doing during music class.		.594				
1. I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.	.334	.556				
3. I feel I have the knowledge needed to understand what is taught in music class.	.344	.537				.310
10. It is always clear to me when I am doing well in music class.		.509		.311		
30. I feel I can control what I am doing in music class.		.457			.375	
23. I am good at exchanging ideas with my classmates and doing group work in music class.			.784			
22. When I need help I ask the teacher.			.693			
24. When the teacher or another classmate asks a question that I know the answer to, I will say so and respond			.652			
25. I work with classmates to cope with tasks or projects required by the music course.			.646			
33. During musical activities, I am not concerned with how I present myself.				.794		

32. During musical activities, I am not concerned with what others may have been thinking of me.				.660		
34. During musical activities, I do things automatically without having to think.		.371		.621		
35. During music class, I am not worried about how well I do as long as I know I am doing my best.	.356			.516		
28. During musical activities in class, I play/sing the correct notes without hesitation.		.429		.476	.353	
31. I have a feeling of control when participating in musical activities.	.406	.365		.414		
18. When someone disturbs the music class I am not happy.	.339				.681	
19. During music class, I focus on the activities and do not do other things that have nothing to do with the class.	.305				.621	
17. During music class I am not distracted.					.576	.466
29. During musical activities, I feel in total control of what I am doing.		.456			.461	
21. When listening to the music teacher, I am so interested that I am unaware of what is going on around me that is not related to the music class.	.347		.338	.305	.369	
6.Clear targets are set for us in music class.						.586
7. I know clearly what is expected of me in music class.						.578

The rotated factor loadings for the combined data based on the six-factor solution are at Table 8.6, in which factor loadings of more than .3 are reflected.

Combined factor 1 (CF1) had an Eigenvalue of 5.959 accounting for 17.027% of all variance. 18 variables with loadings ranging from .305 to .756 accounted for the flow dimensions of autotelic experience (11, 12, 13, 14, 15, 16), concentration (18, 19, 20, 21), time transformation (26, 27), challenge-skill balance (1, 3), clear goals (5, 8), sense of control (31) and loss of self-consciousness (35). Of these, all the variables for autotelic experience and time transformation had high loadings ranging from .653 to .756, while the loadings for the other dimensions were lower, ranging from .305 to .406. The gap between the loadings of the two groups of dimensions (.247), coupled with the higher loadings would appear to suggest that

autotelic experience and time transformation were the dominant dimensions for CF1, in spite of the fact that they accounted for only eight out of the ten variables loaded. It was also noted that the variables for time transformation did not load onto any of the other factors, suggesting that it was closely intertwined with autotelic experience. In this regard, CF1 shared similar flow characteristics as PF1 and SF1. As such, CF1 was also named ‘absorbed enjoyment’.

CF2 had an Eigenvalue of 4.302 accounting for variance of 12.29%. 14 variables loading between .314 to .714 manifested the dimensions of challenge-skill balance (1, 2, 3, 4), sense of control (29, 30, 31), unambiguous feedback (9, 10), action-awareness merging (28, 34), clear goals (5, 8) and autotelic experience (12). The higher factor loadings of >.5 were found in the challenge-skill balance (1, 2, 3, 4), unambiguous feedback (9, 10) and clear goals (8) ranging between .509 to .713, while all other variables loaded lower from .314 to .456. Challenge-skill balance was clearly the most prominent of the dimensions mapped, along with unambiguous feedback and some element of clear goals. Given that the flow precedents were all fairly prominent in CF2, it bore some similarities with PF2 and SF2. However, a case could also be made that sense of control also had a degree of prominence as variables 29 and 30 loaded relatively highly at .456 and .457 respectively. As such, CF2 was named ‘controlled flow preparation’.

CF3 had an Eigenvalue of 3.225 and variance of 9.215% with 7 variables loading. Of these, the variables for unambiguous feedback (22, 23), clear goals (24, 25) had higher loadings ranging from .646 to .748, while loadings for the other three were lower, from .338 to .366. Unambiguous feedback and clear goals were clearly the dominant dimensions for CF3, which would seem to imply that the goals for the activity and provision of feedback were closely related in the flow experience. Variables 22, 23, 24 and 25 also did not load into any other factor and its flow characteristics bore some resemblance to PF3. CF3 was therefore also named ‘co-operation and communication’.

CF4 had an Eigenvalue of 3.013 and accounted for variance of 8.609%. Eight variables mapped onto the flow dimensions of loss of self-consciousness (32, 33, 35), action-awareness merging (28, 34), sense of control (31), unambiguous feedback (.311) and concentration (21). Of these, the variables for loss of self-consciousness (32, 33, 35) loaded higher, together with variable 34, with loadings between .516 to .794. The other variables had lower loadings of .305 to .476. As variable 28 had a relatively high loading of .476, it could be said that loss of self-

consciousness and action-awareness merging were the most prominent dimensions here. In this, CF4 was quite similar to PF5 and SF4 and was named ‘unconscious action’.

The Eigenvalue of CF5 was 2.599 accounting for variance of 7.426%. Eight variables loaded onto the dimensions of concentration (17, 18, 19, 20, 21), action-awareness merging (28, 30) and sense of control (29). With three variables loading higher between .576 to .681 for concentration (17, 18, 19) and the others loading lower from .353 to .461, concentration would appear to be the main flow dimensions for CF5. While variable 29 for action-awareness merging also had a somewhat higher loading of .461, it might suggest that when concentrating during musical activities, students also had a sense that they were able to ‘control’ what they were doing. However, as concentration was strongly manifested here, it had some similarities with SF3, though for CF5, the sense of concentration was clearer as fewer dimensions loaded here. CF5 was therefore named ‘clear concentration’.

CF6 had an Eigenvalue of 2.029 accounting for 5.797% of variance. Seven variables loaded onto the dimensions of clear goals (5, 6, 7), autotelic experience (15, 16), concentration (17) and challenge-skill balance (3). Variables 6 and 7 loaded the highest here, with loadings of .586 and .578 respectively. With other variables loading lower from .31 to .466, including variable 5 at .339, clear goals would appear to be the most prominent flow dimension here, though variable 17 (concentration) loaded fairly highly as well at .466. It is noted that clear goals was also prominent in CF2, though its loading there was relatively weaker with just one variable loading in the higher range and another in the lower range. It could be inferred that clear goals was a somewhat pervasive quality in the students’ flow experiences. CF6 was therefore named ‘focused clear goals’.

8.4.1 Discussion of combined cohort factor loadings

Based on the loadings of the variables derived from their respective flow dimensions within each factor, it would appear that eight dimensions of the flow experience manifested clearly in the six factors: autotelic experience and time transformation to CF1, challenge-skill balance, clear goals and unambiguous feedback onto CF2, unambiguous feedback and clear goals onto CF3, loss of self-consciousness and action-awareness merging onto CF4, concentration onto CF5 and clear goals onto CF6. The dimension that did not map clearly onto any of the

factors was sense of control, which seemed to be a consistent theme in the analysis of the primary and secondary schools' datasets.

Examining how the flow dimensions were mapped across all three datasets, a few of the factors showed similar characteristics. The factor that accounted for the greatest variance based on Eigenvalue (PF1, SF1, CF1), called 'absorbed enjoyment', manifested the dimensions of autotelic experience and time transformation, which would appear to allude that not only were these two dimensions closely intertwined, but also to their pre-eminence in the students' flow experiences. The second-highest loading factor across all three datasets (PF2, SF2, CF2), called 'flow preparation', also had similarities in having the dimensions of challenge-skill balance, clear goals and unambiguous feedback having higher loadings. The other factor that showed similar characteristics (PF5, SF4, CF4), called 'unconscious actions', prominently featured action-awareness merging and loss of self-consciousness. In all, these three factors accounted for seven of the nine flow dimensions.

The possible implications of the above observations were manifold. Firstly, this would appear to suggest that these seven dimensions were perhaps more clearly experienced by both the primary and secondary school students in a consistent manner when they were in flow. This is not to say that the other dimensions were missing or not experienced, as they loaded onto the other factors in varying degrees, but the different ways they loaded into the primary and secondary school datasets reflected the difference in the way the two cohorts experienced flow. Secondly, as mentioned earlier, the higher the ranking of the factors based on Eigenvalues, the greater the variance they accounted for. The factor 'absorbed enjoyment' showed considerable consistency across all three datasets in having the variables for autotelic experience and time transformation both loading very highly and variables for other dimensions loading much lower in comparison. As such, it was arguable that autotelic experience and time transformation were the most prominent flow dimensions in the students' experiences. Following the same line of argument, with 'flow preparation' the next highest-ranked factor, challenge-skill balance, clear goals and unambiguous feedback would appear to be the most next most prominent dimensions. Thirdly, the seeming similarity in which these dimensions were bunched into the three factors could be an indication of how closely linked they were and perhaps also how they interacted in the flow experience. E.g., for 'absorbed enjoyment', it could imply that students' sense of time was closely

intertwined with their enjoyment of the music classes. For ‘flow preparation’ it could perhaps be an indicator not only of the importance of how judicious lesson preparation and feedback could impact flow, but also the close inter-connectedness of the three dimensions that the students would appear to perceive them as a single process or dimension rather than 3 discrete ones.

8.5 COMPARISON OF PRIMARY AND SECONDARY SCHOOL FACTORS

This section aims to examine the factor loadings of the two cohorts to bring out possible nuances between the flow experiences of the primary and secondary school students. While Csikszentmihalyi had ‘discovered’ the nine flow dimensions, he did not investigate the relative importance of each dimension in the flow experience, though he did say that flow was an individualised experience. Nevertheless, I felt that analysing the flow experiences of large enough samples of primary and secondary school students through the relative loadings of the flow dimensions from the factor analysis might therefore be instructive to yield some understanding of the primary and secondary school students’ flow experiences in the Singaporean music classroom, and also how they were similar or differed.

There were noticeable similarities in the way the flow dimensions loaded into some of the primary and secondary school factors – the common factors of ‘absorbed enjoyment’, ‘flow preparation’ and ‘unconscious actions’ have already been discussed. The commonality of these three factors would appear to suggest that not only were the eight dimensions of challenge-skill balance, clear goals, unambiguous feedback, concentration, action-awareness merging, loss of self-consciousness, time transformation and autotelic experience that loaded onto these factors prominent in the flow experience of both cohorts, but also that may be some similarities in how these dimensions were experienced by the students. Of the nine flow dimensions, only sense of control did not feature prominently – it did not load highly in any of the factors for the primary school cohort and only showed limited prominence for the secondary school cohort (SF4).

At the same time, it should also be noted that the loadings also provided some possible insight into the differing flow experiences of the two cohorts. One potential difference would appear to be reflected in how concentration was manifested. For the primary school students, concentration was somewhat prominent in two of the factors with lower Eigenvalues (PF6 and PF7) and therefore more ‘diffused’, while for the secondary school students, concentration was more

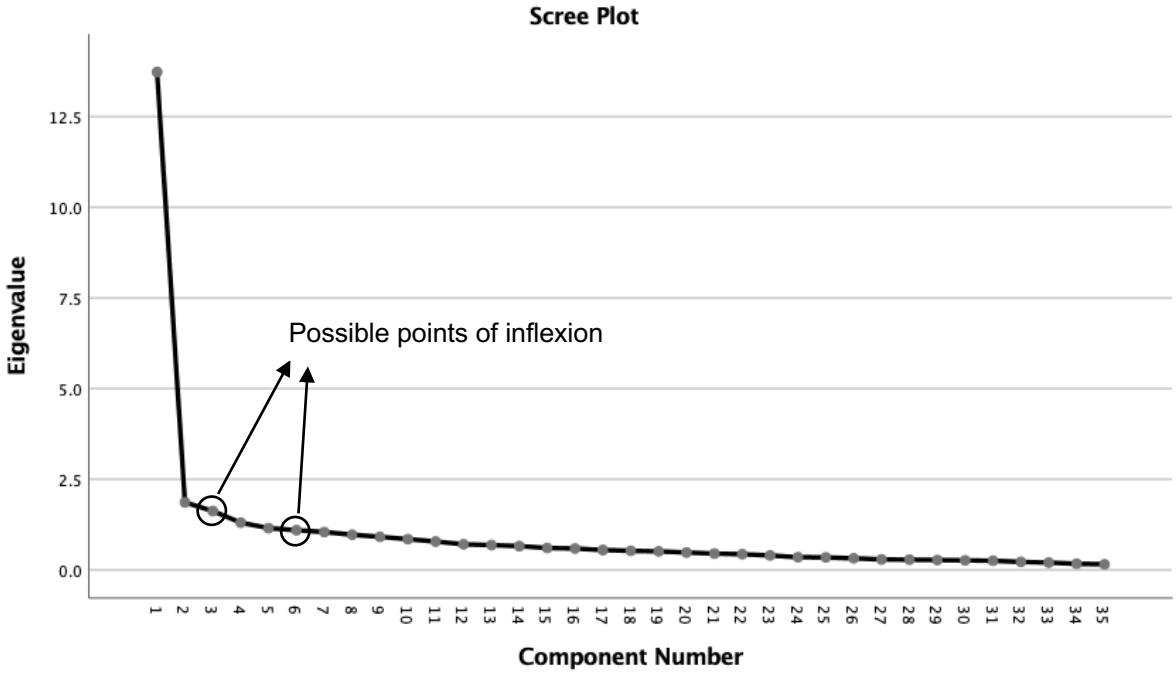
strongly loading into a single factor (SF3). What this might mean was that the primary school students were more easily distracted with possibly a shorter concentration span, given the more 'scattered' nature of concentration for them, while the secondary school students were better able to concentrate during flow and music lessons in general, as the concentration was more 'focused' or loaded into a single factor. What was also clear in spite of these seeming differences was that concentration was an important feature in both cohorts' flow experiences.

8.5 ANALYSIS OF COMBINED COHORT DATA OF STUDENTS WITHOUT PRIOR MUSIC EXPERIENCE

Exploratory factor analysis was conducted on the data from the 35 items gathered from the combined cohort students without prior music experience (CNM) (see chapter on Methodology for definition). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was applied to the CNM sample (N = 203) to test for sampling adequacy. The analysis revealed that KMO = .93, above the recommended value of .5, verifying the adequacy for the CNM sample.

Principal component analysis was used as the method of extraction with varimax rotation and the outcome for the combined dataset is set out in Appendix 10. Using an Eigenvalue threshold of 1, as already set out in the analysis for the primary school dataset, six factors were extracted. The scree plot for the combined dataset was also referred to (ref. Figure 8.4) to check the viability of a six-factor solution:

Table 8.7: Scree plot for combined students without prior music experience data factor analysis



Based on the scree plot, a first possible point of inflexion suggested a two-factor solution. However, this was rejected as there was a risk of under-reporting the factors. A second possible point of inflexion suggested a five-factor solution, which would appear to be more viable. Based on Appendix 10, the five factors accounted for a total variance of 56.182%.

Table 8.8: Combined cohort of students without prior music experience rotated component matrix

Rotated Component Matrix

	Component				
	1	2	3	4	5
15. 1 find what I learn in music class interesting.	.743				
11. I enjoy learning at music class.	.743				
13. Taking part in music activities leaves me feeling great.	.733				
12. I love the feeling I get after music class and want to capture it again.	.684				
16. Music classes are not boring.	.658				
14. Overall I find taking part in music class an extremely rewarding experience.	.648				
27. It feels like time flies during music class.	.565				

26. I am so absorbed in the activities in music class that I do not realise time has passed.	.545				
3. I feel I have the knowledge needed to understand what is taught in music class.	.505	.369			
2. I would be able to do more difficult topics than what is taught in music class.		.738			
4. My abilities match the difficulty of what we do in music class.		.695			
1. I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.		.652			
8. During music class I have a strong sense of what I want to do.	.360	.517			.346
28. During musical activities in class, I play/sing the correct notes without hesitation.		.407		.350	
31. I have a feeling of control when participating in musical activities.	.367	.398	.335		
23. I am good at exchanging ideas with my classmates and doing group work in music class.			.774		
25. I work with classmates to cope with tasks or projects required by the music course.			.736		
22. When I need help I ask the teacher.			.655		
24. When the teacher or another classmate asks a question that I know the answer to, I will say so and respond			.594		.336
20. During music class, I am totally focused on the music making experience.	.361		.517		
35. During music class, I am not worried about how well I do as long as I know I am doing my best.	.374		.447	.362	
32. During musical activities, I am not concerned with what others may have been thinking of me.				.771	
33. During musical activities, I am not concerned with how I present myself.				.666	
34. During musical activities, I do things automatically without having to think.		.463		.547	

21. When listening to the music teacher, I am so interested that I am unaware of what is going on around me that is not related to the music class.	.384			.396	
29. During musical activities, I feel in total control of what I am doing.		.329		.364	
6.Clear targets are set for us in music class.					.694
5. I know what I want to achieve out of music class.	.390				.604
9. I can tell how well I am doing during music class.		.355			.539
10. It is always clear to me when I am doing well in music class.		.390			.521
17. During music class I am not distracted.					
30. I feel I can control what I am doing in music class.					
7. I know clearly what is expected of me in music class.	.312		.322		.412
18. When someone disturbs the music class I am not happy.					
19. During music class, I focus on the activities and do not do other things that have nothing to do with the class.					

The rotated factor loadings for the combined data based on the five-factor solution are at Table 8.8, in which factor loadings of more than .3 are reflected.

Combined non-music factor 1 (CNF1) had an Eigenvalue of 5.516 accounting for 15.759% of all variance. 16 variables with loadings ranging from .312 to .743 accounted for the flow dimensions of autotelic experience (11, 12, 13, 14, 15, 16), clear goals (5, 7, 8), time transformation (26, 27), concentration (20, 21), challenge-skill balance (3), loss of self-consciousness (35), and sense of control (31). Not only did all six variables for autotelic experience loaded onto this factor, the factor loadings were also the highest, ranging from .648 to .743, making it the most prominent flow dimension here. This was followed by time transformation with two factors and factor loadings of .565 and .545, which also happened to be the next highest, indicating this dimension's prominence. Challenge-skill balance also appeared to play a role of some importance in CNF1 as one of its variables (3) had a high factor loading of .505. The other variables all had relatively lower loadings ranging from .312 to .390 with a gap of .215 between them and the higher loaded variables. The pre-eminence of the dimensions of autotelic experience and time

transformation here was also reflected in the fact that their combined eight variables did not load onto any of the other factors. With its flow characteristics sharing strong similarities with PF1 and SF1, but with the additional prominence of challenge-skill balance, CNF1 was named ‘calibrated absorbed enjoyment’.

CNF2 had an Eigenvalue of 3.502 accounting for 10.006% of variance, its 11 variables having factor loadings ranging from .329 to .695. The flow dimensions of challenge-skill balance (1, 2, 3, 4), action-awareness merging (28, 34), unambiguous feedback (9, 10), sense of control (29, 31) and clear goals (8) were manifested here. The dimension of challenge-skill balance would appear to be the most important for CNF2, with three of its variables reflecting the highest loadings ranging from .652 to .738 (1, 2, 4) with another variable loading lower at .369 (3). The other dimension with a high loading variable was clear goals at .517 (8). While the other variables had lower factor loadings ranging from .329 to .463, it could be said that action-awareness merging also had some degree of importance here with its two variables loading relatively highly (.463 and .407). CNF2 was therefore named ‘guided actions’.

CNF3 had an Eigenvalue of 3.501 accounting for 10.002% of variance, with eight variables loading between .322 to .744, reflecting the flow dimensions of clear goals (7, 24, 25), unambiguous feedback (22, 23), concentration (20), loss of self-consciousness (35) and sense of control (31). The variables for unambiguous feedback and two of those for clear goals (24, 25) had high loadings ranging from .594 to .744 while that for concentration was .517. As the rest of the loadings were on the lower side, ranging from .322 to .447, the dimensions of clear goals, unambiguous feedback and concentration would appear to be prominent in CNF3. With the flow precedents of clear goals and unambiguous feedback loading strongly, CNF3 would appear to share some similarities with the factor of ‘flow preparation’ (PF2 and SF2), albeit without the third dimension of challenge-skill balance and with the addition of concentration. CNF3 was therefore named ‘guided focus’.

CNF4 had an Eigenvalue of 2.554 which accounted for 7.298% of variance. Seven variables with loadings ranging from .35 to .771 loaded onto CNF4, accounting for the dimensions of loss of self-consciousness (32, 33, 35), action-awareness merging (28, 34), sense of control (29) and concentration (21). The loadings for two of the variables for loss of self-consciousness (32, 33) and action-awareness merging were higher, ranging from .547 to .771, while the loadings for the others were lower, ranging from .350 to .396, including another variable for loss of

self-consciousness (35) at .362. It could therefore be concluded that the dimensions of loss of self-consciousness and action-awareness merging were prominent in CNF4, which bore considerable resemblance to the characteristics of factors PF5 and SF4. CNF4 was therefore similarly named ‘unconscious action’.

CNF5 had an Eigenvalue of 2.489 and accounted for 7.111% of variance. A total of seven variables with loadings ranging from .336 to .694 accounted for two: flow dimensions: clear goals (5, 6, 7, 8) and unambiguous feedback (9, 10, 24). Each dimension reflected high factor loadings ranging from .521 to .694 for two of its variables, namely 5 and 6 for clear goals and 9 and 10 for unambiguous feedback. As no other dimensions loaded onto CNF5, it was clear that both clear goals and unambiguous feedback were prominent here. In this regard, it shared similar characteristics with CNF3, albeit without the prominence of concentration. As the elements of feedback and goals were strongly reflected in the variables, CNF5 was named ‘guidance’.

8.5.1 Discussion of factor loadings of combined cohort of students without prior music experience data

Based on the loadings of the variables derived from their respective flow dimensions within each factor, it would appear that eight dimensions of the flow experience manifested in the five factors: autotelic experience, time transformation and challenge-skill balance were prominent in CNF1, challenge-skill balance, clear goals and action-awareness merging in CNF2, clear goals, unambiguous feedback and concentration in NF3, loss of self-consciousness and action-awareness merging in NF4, and clear goals and unambiguous feedback in CNF5. Sense of control was the only dimension that did not map onto any of the factors. In addition, it was also arguable that based on its relatively weaker factor loading (one variable with high factor loading of .517 in NF3) compared to the others, the dimension of concentration also did not prominently influence the flow experiences of the students without prior music experience.

Examining the order of the flow dimensions as they appeared in the factors could provide some indication of their relative importance in the students’ flow experiences. The strong factor loadings for autotelic experience and time transformation in CNF1 ‘calibrated absorbed enjoyment’ would appear to suggest that those two dimensions were both closely aligned in the students’ experiences, that when the students’ experiences were enjoyable, this was accompanied by a

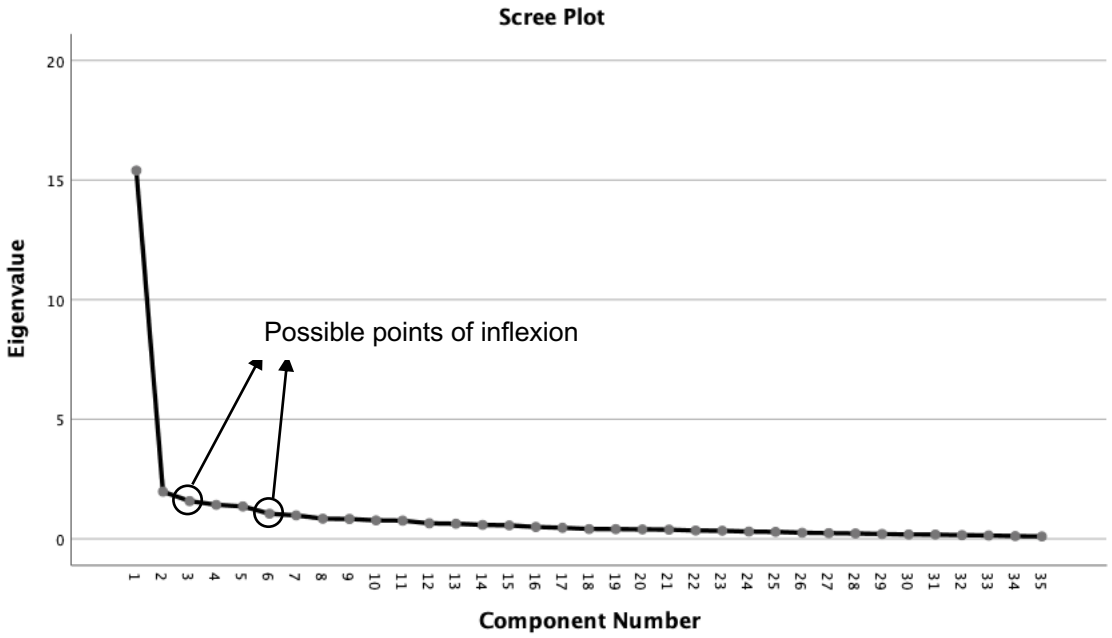
distorted sense of time either appearing to pass quicker or slower. Challenge-skill balance would arguably be the next most prominent dimension, given its high loading in CNF2 ‘guided actions’. Viewed together with the prominence of clear goals and unambiguous feedback in CNF3 ‘guided focus’ and again in CNF5 ‘guidance’, these underlined the importance of the flow precedents in the flow experience of this sample of students, even if the three did not load together in the same factor as was the case for the primary and secondary school cohorts. In CNF4 ‘unconscious action’ the co-prominence of loss of self-consciousness and action-awareness merging intimated at the close relatedness of these two dimensions when students’ did things ‘automatically’ and without hesitation.

8.6 ANALYSIS OF COMBINED COHORT DATA OF STUDENTS WITH PRIOR MUSIC EXPERIENCE

Exploratory factor analysis was conducted on the data from the 35 items gathered from the combined cohort students with prior music experience (CM) (see chapter on Methodology for definition). The KMO measure of sampling adequacy was applied to the CM sample (N = 161) to test for sampling adequacy. The analysis revealed that KMO = .93, above the recommended value of .5, verifying the adequacy for the CM sample.

Principal component analysis was used as the method of extraction with varimax rotation and the outcome for the combined dataset is set out in Appendix 11. Using an Eigenvalue threshold of 1, as already set out in the analysis for the primary school dataset, six factors were extracted. The scree plot for the combined dataset was also referred to (ref. Table 8.9) to check the viability of a six-factor solution:

Table 8.9: Scree plot for combined cohort of students with prior music experience data factor analysis



Based on the scree plot, a first possible point of inflexion suggested a two-factor solution. However, this was rejected as there was a risk of under-reporting the factors. A second possible point of inflexion suggested a five-factor solution, which would appear to be more viable. Based on Appendix 11, the five factors accounted for a total variance of 58.205%.

Table 8.10: Combined cohort of students with prior music experience rotated component matrix

Rotated Component Matrix

	Component				
	1	2	3	4	5
16. Music classes are not boring.	.811				
11. I enjoy learning at music class.	.788				
13. Taking part in music activities leaves me feeling great.	.763				
26. I am so absorbed in the activities in music class that I do not realise time has passed.	.736	.336			
12. I love the feeling I get after music class and want to capture it again.	.734				
27. It feels like time flies during music class.	.713				
14. Overall I find taking part in music class an extremely rewarding experience.	.699				
15. 1 find what I learn in music class interesting.	.648		.331		

29. During musical activities, I feel in total control of what I am doing.		.670			
9. I can tell how well I am doing during music class.		.595	.459		
28. During musical activities in class, I play/sing the correct notes without hesitation.		.589			.423
18. When someone disturbs the music class I am not happy.	.405	.584			
30. I feel I can control what I am doing in music class.	.351	.572	.410		
19. During music class, I focus on the activities and do not do other things that have nothing to do with the class.	.362	.503	.316		.325
21. When listening to the music teacher, I am so interested that I am unaware of what is going on around me that is not related to the music class.		.499		.304	
2. I would be able to do more difficult topics than what is taught in music class.		.488	.345		
17. During music class I am not distracted.	.333	.473			
20. During music class, I am totally focused on the music making experience.	.442	.469			.338
7. I know clearly what is expected of me in music class.			.765		
8. During music class I have a strong sense of what I want to do.	.342		.692		
3. I feel I have the knowledge needed to understand what is taught in music class.			.633		
4. My abilities match the difficulty of what we do in music class.		.324	.474		
22. When I need help I ask the teacher.				.772	
23. I am good at exchanging ideas with my classmates and doing group work in music class.				.751	
24. When the teacher or another classmate asks a question that I know the answer to, I will say so and respond				.682	
5. I know what I want to achieve out of music class.	.433		.424	.493	
25. I work with classmates to cope with tasks or projects required by the music course.			.351	.393	

33. During musical activities, I am not concerned with how I present myself.					.802
32. During musical activities, I am not concerned with what others may have been thinking of me.	.371				.639
35. During music class, I am not worried about how well I do as long as I know I am doing my best.			.380		.620
34. During musical activities, I do things automatically without having to think.		.395			.609
31. I have a feeling of control when participating in musical activities.	.396			.311	.440
1. I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.					
10. It is always clear to me when I am doing well in music class.		.344			
6.Clear targets are set for us in music class.				.313	

The rotated factor loadings for the combined data based on the five-factor solution are at Table 8.10, in which factor loadings of more than .3 are reflected.

Combined music factor 1 (CMF1) had a total of 17 variables loading onto it, eight of which had high loadings of .648 to .811, while the other nine had lower loadings of .333 to .442. These reflected the flow dimensions of autotelic experience (11, 12, 13, 14, 15, 16), concentration (17, 18, 19, 20), time transformation (26, 27), sense of control (31, 31), clear goals (5, 8) and loss of self-consciousness (32). The higher-loading variables reflected the dimensions of autotelic experience (.648 to .811) and time transformation (.713 to .736), which would suggest their prominence in this factor. As such, similar to the other factors from other data cohorts with similar characteristics, this factor was named ‘absorbed enjoyment’.

A total of 14 variables with values ranging from .324 to .67 loaded onto combined music factor 2 (CMF2), reflecting the flow dimensions of concentration (17, 18, 19, 20, 21), sense of control (29, 30), unambiguous feedback (9, 10), action-awareness merging (28, 34), challenge-skill balance (2, 4) and time transformation (26). Of these, a total of six variables had high loadings, namely two from sense of control (29, 30; .572 to .67), two from concentration (18, 19; .503 to .584), one for unambiguous feedback (9; .595) and one for action-awareness merging (28; .589). The other variables had lower loadings ranging from .336 to .499. Overall, four of the

six dimensions had high loading variables, concentration having the most prominence with two high-loading variables as well as its other three also having relatively higher loadings ranging from .469 to .499. Sense of control was also influential in this factor with two variables with high loadings, together with unambiguous feedback and action-awareness merging, gave a sense of the seeming complexity of this factor. The 'interplay' of the dimensions gave a sense that students were able to focus when they received clear feedback, giving them confidence as they carried out the activities. CMF2 was therefore named 'focused confidence'.

CMF3 had a total of 12 variables loaded, ranging from .331 to .765, which covered the dimensions of clear goals (5, 7, 8), challenge-skill balance (2, 3, 4), unambiguous feedback (9, 25), sense of control (30), loss of self-consciousness (35), autotelic experience (15) and concentration (19). The dimensions with high loadings ranging from .633 to .765 were clear goals (7, 8) and challenge-skill balance (3), while the other nine variables had lower loadings ranging from .316 to .474. Clear goals and challenge-skill balance could be said to have strong manifestations in this factor, with challenge-skill balance also having a variable (4) which had a relatively higher loading of .474. Some similarities could be drawn between CMF3 and the earlier reported factor of 'flow preparation' with the presence of the three flow precedent dimensions, though the presence of unambiguous feedback could not be said to be strong. As the dimensions of challenge-skill balance and clear goals hinted at the design of the activity or lesson but lacked the element of feedback, CMF3 was named 'planning'.

CMF4 had a total of eight variables loaded, ranging from.304 to .772, covering the dimensions of clear goals (5, 6, 22, 23), unambiguous feedback (24, 25), sense of control (31) and concentration (21). High loadings were found in two of the variables for unambiguous feedback (23, 24) ranging from .682 to .752, and one variable for clear goals (22) at .772. Clear goals also had another variable that loaded relatively higher (5) at .493, while the variables for the other dimensions were lower, ranging from .304 to .393. As such, the prominent flow dimensions were unambiguous feedback and clear goals, which meant that CMF4 also intimated at strong presence of the flow precedents. In this, CMF4 shared similar characteristics with CF3 and was therefore named 'co-operation and communication'.

A total of eight variables loaded onto CMF5, their values ranging from .325 to .802, covering the dimensions of loss of self-consciousness (32, 33) action-

awareness merging (28, 34, 35), concentration (19, 20) and sense of control (31). The dimensions of loss of self-consciousness (32, 33, 35) and action-awareness merging (34) had high variable loadings ranging from .609 to .802, while the others had lower loadings from .325 to .44. It could therefore be said that the prominent dimensions for CMF5 were loss of self-consciousness and action-awareness. As this had similar characteristics with previously reported factor of PF4, SF5 and CNF4, CMF5 was therefore also named ‘unconscious action’.

8.6.1 Discussion of factor loadings of combined cohort of students with prior music experience data

From the analysis of the factor loadings, all nine flow dimensions were found to be prominent in the five factors of the data from the combined cohort of students with prior music experience. Autotelic experience and time transformation were prominent in CMF1 ‘absorbed enjoyment’, sense of control, concentration, unambiguous feedback and action-awareness merging in CMF2 ‘focused confidence’, challenge-skill balance and clear goals in CMF3 ‘planning’, unambiguous feedback and clear goals in CMF4 ‘co-operation and communication’, and loss of self-consciousness and action-awareness merging in CMF5 ‘unconscious action’.

Based on the order of the dimensions as they appeared in the factors, autotelic experience and time transformation would appear to be have featured most prominently in the students’ classroom experiences. While a case could be made for the four dimensions found in ‘focused confidence’ to be next in prominence, it should be noted that only one variable each for unambiguous feedback and action-awareness merging had high loadings here, leaving concentration and sense of control as possibly having more importance. The importance of these two dimensions would appear to suggest that students with prior music experience had a stronger ability to concentrate which allowed them to feel in control of what they had to do during the music lessons. Challenge-skill balance and clear goals appear next in ‘planning’ and both unambiguous feedback and clear goals appear again in ‘co-operation and communication’, highlighting the relative importance of the flow precedents in the students’ overall flow experiences. It could be said that the three flow precedents were also influential in the flow experiences for this cohort of students, though they did not all load into a single factor. Clear goals was the common dimension between the two factors, implying that it might have the most

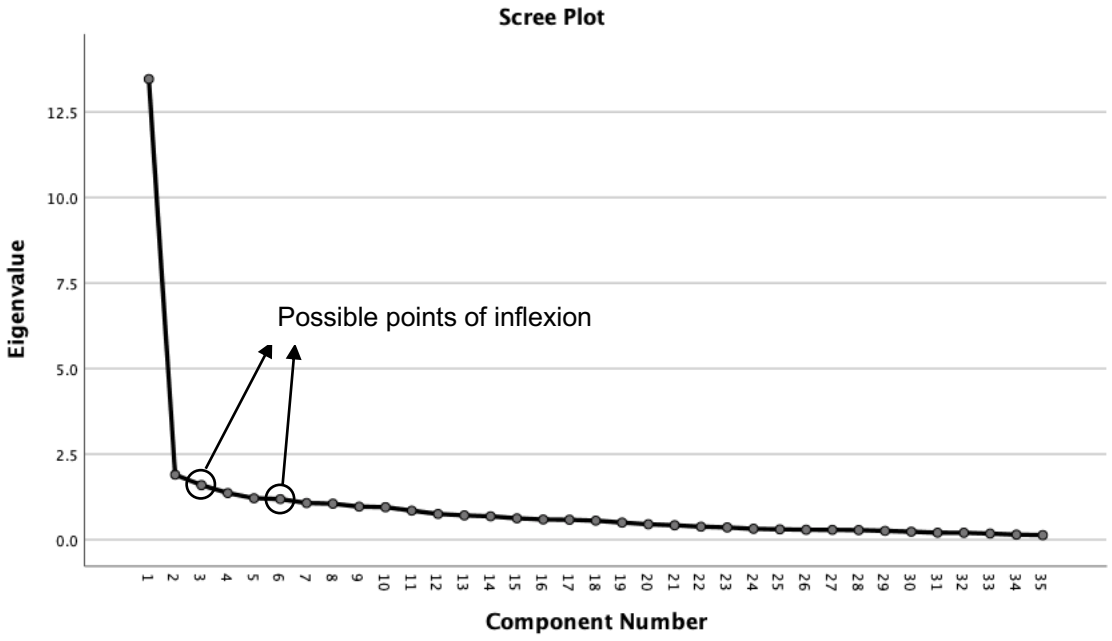
significance of three precedents, meaning that having clear lesson or activity objectives for this cohort of students was key to enabling flow experiences. Loss of self-consciousness and action-awareness merging rounded up the nine dimensions, with the latter likely shading the former in importance due to its presence in 'focused confidence'. It was also noteworthy that this was the only cohort that in which all the flow dimensions loaded into its component factors.

8.7 ANALYSIS OF PRIMARY SCHOOL COHORT DATA OF STUDENTS WITHOUT PRIOR MUSIC EXPERIENCE

Exploratory factor analysis was conducted on the data from the 35 items gathered from the combined cohort students without prior music experience (PNM) (see chapter on Methodology for definition). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was applied to the CNM sample (N = 151) to test for sampling adequacy. The analysis revealed that KMO = .909, above the recommended value of .5, verifying the adequacy for the PNM sample.

Principal component analysis was used as the method of extraction with varimax rotation and the outcome for the combined dataset is set out in Appendix 12. Using an Eigenvalue threshold of 1, eight factors were extracted. Reference was made to the scree plot for the dataset (ref. Table 8.11) to check the viability of an eight-factor solution:

Table 8.11: Scree plot for primary school students without prior music experience data factor analysis



Based on the scree plot, a first possible point of inflexion suggested a two-factor solution. However, this was rejected due to the risk of under-reporting the factors. A second possible point of inflexion suggested a five-factor solution, which would appear to be more viable. Based on Appendix 12, the five factors accounted for a total variance of 55.782%.

Table 8.12: Primary school data of students without prior music experience rotated component matrix

Rotated Component Matrix

	Component				
	1	2	3	4	5
27. It feels like time flies during music class.	.762				
11. I enjoy learning at music class.	.703				
13. Taking part in music activities leaves me feeling great.	.702			.325	
12. I love the feeling I get after music class and want to capture it again.	.673				
26. I am so absorbed in the activities in music class that I do not realise time has passed.	.667				
15. 1 find what I learn in music class interesting.	.634			.487	
16. Music classes are not boring.	.633				.389
14. Overall I find taking part in music class an extremely rewarding experience.	.615				
31. I have a feeling of control when participating in musical activities.	.413		.329		.402
21. When listening to the music teacher, I am so interested that I am unaware of what is going on around me that is not related to the music class.	.395	.313	.320		
25. I work with classmates to cope with tasks or projects required by the music course.		.743			
23. I am good at exchanging ideas with my classmates and doing group work in music class.		.722			
22. When I need help I ask the teacher.		.722			
20. During music class, I am totally focused on the music making experience.	.370	.546			
24. When the teacher or another classmate asks a		.531			

question that I know the answer to, I will say so and respond					
35. During music class, I am not worried about how well I do as long as I know I am doing my best.	.415	.474			
2. I would be able to do more difficult topics than what is taught in music class.			.737		
4. My abilities match the difficulty of what we do in music class.			.699		
1. I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.			.609		
8. During music class I have a strong sense of what I want to do.			.452	.398	
29. During musical activities, I feel in total control of what I am doing.			.432	.340	
6.Clear targets are set for us in music class.				.710	
5. I know what I want to achieve out of music class.	.313			.545	
3. I feel I have the knowledge needed to understand what is taught in music class.			.398	.523	
7. I know clearly what is expected of me in music class.		.322		.456	.401
17. During music class I am not distracted.					.778
19. During music class, I focus on the activities and do not do other things that have nothing to do with the class.					.535
28. During musical activities in class, I play/sing the correct notes without hesitation.			.447		.483
30. I feel I can control what I am doing in music class.					.481
32. During musical activities, I am not concerned with what others may have been thinking of me.					
33. During musical activities, I am not concerned with how I present myself.					
34. During musical activities, I do things automatically without having to think.			.436		
9. I can tell how well I am doing during music class.					
10. It is always clear to me when I am doing well in music class.					

18. When someone disturbs the music class I am not happy.					

The rotated factor loadings for the combined data based on the five-factor solution are at Table 8.12, in which factor loadings of more than .3 are reflected.

Primary Non-music Factor 1 (PNF1) had and Eigenvalue of 5.29, accounting for 15.116% of total variance. A total of 13 variables loading onto it, eight of which had high loadings of .648 to .811, while the other nine had lower loadings of .333 to .442. These reflected the flow dimensions of autotelic experience (11, 12, 13, 14, 15, 16), time transformation (26, 27), concentration (20, 21), sense of control (31), clear goals (5) and loss of self-consciousness (35). The higher-loading variables were for the dimensions of autotelic experience (.615 to .703) and time transformation (.667 to .762), while the other variables had low loadings ranging from .313 to .415. Similar to other factors which featured the prominence of autotelic experience and time transformation, PNF1 was named ‘absorbed enjoyment’.

The Eigenvalue of PNF2 was 3.51 which accounted for 10.028% of variance. Eight variables loaded onto PNF2, five of which had high loadings ranging from .531 to .743, while three had low loadings of .313 to .474. The flow dimensions manifested were clear goals (7, 22, 23), unambiguous feedback (24, 25), concentration (21) and loss of self-consciousness (35). Clear goals (22, 23), unambiguous feedback (24, 25) and concentration (20) would appear to be the prominent dimensions here, their respective variables having the high loadings, being .722 (for both 22 and 23), .531 and .743 (for 25 and 24) and .546 (for 20). With clear goals and unambiguous feedback at the forefront, PNF2 would appear to share some similarities with CF3 and CMF4 ‘co-operation and communication’, but with an added element of concentration. PNF2 was therefore named ‘focused co-operation and communication’.

PNF3 had an Eigenvalue of 3.207 which accounted for 9.161% of variance. It saw a total of ten variables loading, which accounted for the dimensions of challenge-skill balance (1, 2, 3, 4), action-awareness merging (28, 34), sense of control (29, 31), clear goals (8) and concentration (21). The three variables with high loadings were for challenge-skill balance (1, 2, 4), ranging from .609 to .737, while the other variables had low loadings ranging from .32 to .452. A case could be made for action-awareness merging having some prominence here with its relatively high factor loadings of .447 and .437, but there was a difference of .152 difference

between its highest loading and the lowest for that of challenge-skill balance (.609). Challenge-skill balance would therefore appear to be the only prominent dimension for PNF3 and was named ‘challenge-skill balance’.

PNF4 had an Eigenvalue of 2.583 accounting for variance of 7.379%. Eight variables loaded onto PNF4, which included the dimensions of clear goals (5, 6, 7, 8), autotelic experience (13, 15), challenge-skill balance (3) and sense of control (29). There were high loadings for three of the variables, ranging from .523 to .71, which came from two variables for clear goals (5, 6; .545, .71 respectively) and challenge-skill balance (3; .523), while the other five variables with low loadings had values ranging from .325 to .487. Clear goals and challenge-skill balance would appear to be the most prominent dimensions for PNF4. It therefore bore similarities with CMF4 and CF3 and was named ‘planning’.

PNF5 had an Eigenvalue of 2.497 and accounted for 7.134% of variance. Seven variables loaded onto this factor, accounting for the dimensions of concentration (17, 19), sense of control (30, 31), action-awareness merging (28), clear goals (7) and autotelic experience 16). Both variables for concentration had high loadings of .778 and .535, while the other variables had low loadings ranging from .389 to .483. As such, the factor was called ‘concentration’.

8.7.1 Discussion of factor loadings of cohort of primary school students without prior music experience data

For this cohort of students, a total of six flow dimensions were found to have loaded into the five factors derived: challenge-skill balance, clear goals, unambiguous feedback, concentration, time transformation and autotelic experience. The three factors that did not load were sense of control, action-awareness merging and loss of self-consciousness. As with all the other cohorts, autotelic experience and time transformation would appear to have been the most prominent dimensions, given their accounting for the highest variance of 15.116%. Next in importance would be the flow precedents challenge-skill balance, clear goals and unambiguous feedback, first appearing in ‘focused co-operation and communication’ and ‘challenge-skill balance, with clear goals and challenge-skill balance prominent again in ‘co-operation and communication’. Concentration was also an important factor, manifesting strongly in both ‘focused co-operation and communication’ and on its own in ‘concentration’. In comparison with the other analyses thus far, the primary school students without prior music experience was the only cohort that had factors

which manifested a single flow dimension strongly, namely challenge-skill balance and concentration.

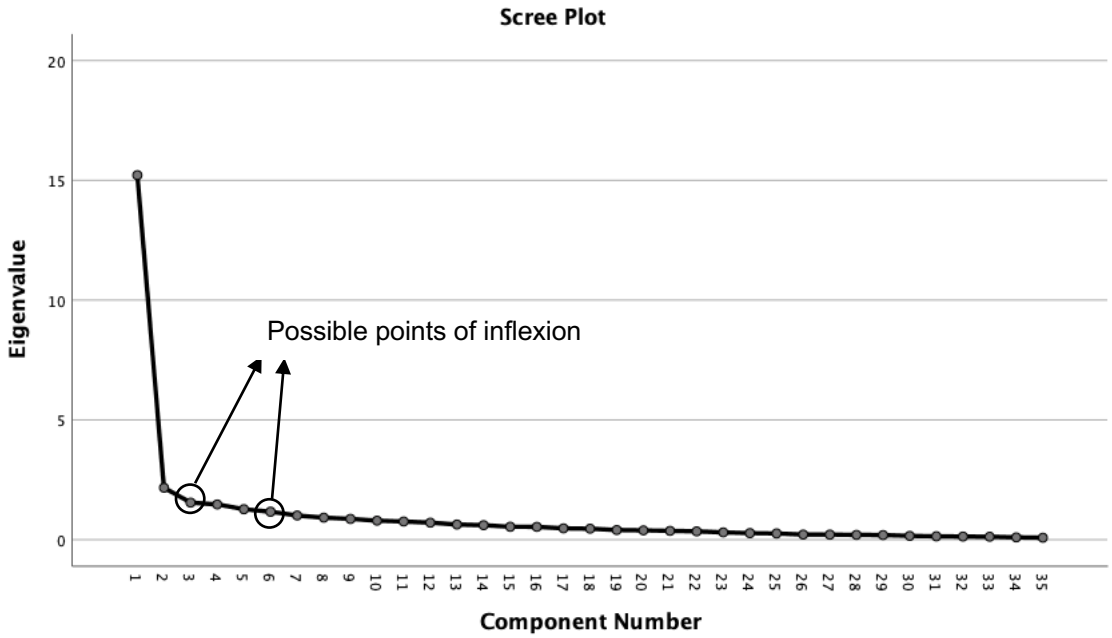
An examination of the manifested dimensions hinted at a few possible conclusions. Firstly, it was likely that teacher participation played an important role in facilitating the students' experiences, in particular challenge-skill balance, given that it manifested as a single factor. Peer support and teamwork would also appear to have played a part. Secondly, it was also noticeable that the three 'less prominent' dimensions were those that described flow participants' absorption in the activities, appearing to suggest that the primary school students' experiences were not and did not need to be at a deep level of engagement for them to engender enjoyment. What this meant was that the students felt happy just going through the musical activities planned for them.

8.8 ANALYSIS OF PRIMARY SCHOOL COHORT DATA OF STUDENTS WITH PRIOR MUSIC EXPERIENCE

Exploratory factor analysis was conducted on the data from the 35 items gathered from the combined cohort students with prior music experience (see chapter on Methodology for definition). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was applied to the PM sample (N = 119) to test for sampling adequacy. The analysis revealed that KMO = .91, above the recommended value of .5, verifying the adequacy for the PM sample.

Principal component analysis was used as the method of extraction with varimax rotation and the outcome for the combined dataset is set out in Appendix 13. Using an Eigenvalue threshold of 1, seven factors were extracted. Reference was made to the scree plot for the dataset (ref. Table 8.13) to check the viability of a seven-factor solution:

Table 8.13: Scree plot for primary school students with prior music experience data factor analysis



Based on the scree plot, a first possible point of inflexion suggested a two-factor solution. However, this was rejected due to the risk of under-reporting the factors. A second possible point of inflexion suggested a five-factor solution, which would appear to be more viable. Based on Appendix 13, the five factors accounted for a total variance of 61.915%.

Table 8.14: Primary school data of students with prior music experience rotated component matrix

Rotated Component Matrix

	Component				
	1	2	3	4	5
16. Music classes are not boring.	.811				
12. I love the feeling I get after music class and want to capture it again.	.800				
13. Taking part in music activities leaves me feeling great.	.789				
11. I enjoy learning at music class.	.788				
26. I am so absorbed in the activities in music class that I do not realise time has passed.	.753				
14. Overall I find taking part in music class an extremely rewarding experience.	.721				
27. It feels like time flies during music class.	.699				

15. 1 find what I learn in music class interesting.	.655		.332		
31. I have a feeling of control when participating in musical activities.	.409	.336	.314		.336
9. I can tell how well I am doing during music class.		.704		.421	
29. During musical activities, I feel in total control of what I am doing.		.648			
2. I would be able to do more difficult topics than what is taught in music class.	.325	.647			
28. During musical activities in class, I play/sing the correct notes without hesitation.		.615			
30. I feel I can control what I am doing in music class.	.343	.585		.357	
10. It is always clear to me when I am doing well in music class.		.519			
21. When listening to the music teacher, I am so interested that I am unaware of what is going on around me that is not related to the music class.		.477	.306		
18. When someone disturbs the music class I am not happy.	.426	.452			
20. During music class, I am totally focused on the music making experience.	.408	.445		.302	.323
19. During music class, I focus on the activities and do not do other things that have nothing to do with the class.	.352	.385		.346	
23. I am good at exchanging ideas with my classmates and doing group work in music class.			.768		
22. When I need help I ask the teacher.			.729		
24. When the teacher or another classmate asks a question that I know the answer to, I will say so and respond		.333	.659		
25. I work with classmates to cope with tasks or projects required by the music course.			.589	.327	
5. I know what I want to achieve out of music class.	.473		.527	.310	
7. I know clearly what is expected of me in music class.				.738	
8. During music class I have a strong sense of what I want to do.	.350	.384		.618	

35. During music class, I am not worried about how well I do as long as I know I am doing my best.				.537	.457
3. I feel I have the knowledge needed to understand what is taught in music class.		.415		.531	
33. During musical activities, I am not concerned with how I present myself.					.806
32. During musical activities, I am not concerned with what others may have been thinking of me.	.371				.652
34. During musical activities, I do things automatically without having to think.		.476			.536
17. During music class I am not distracted.					
4. My abilities match the difficulty of what we do in music class.				.460	
1. I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.					
6.Clear targets are set for us in music class.					

The rotated factor loadings for the combined data based on the five-factor solution are at Table 8.14, in which factor loadings of more than .3 are reflected.

Primary Music Factor 1 (PMF1), with a total of 17 variables loaded, had an Eigenvalue of 6.822 and accounted for 19.491% of variance. The flow dimensions found within were autotelic experience (11, 12, 13, 14, 15, 16), concentration (18, 19, 20), time transformation (26, 27), sense of control (29, 30), clear goals (5, 8), loss of self-consciousness (32) and challenge-skill balance (2). The eight variables with high loadings ranging from .655 to .811 were those for autotelic experience and time transformation, making them the most prominent dimensions in PMF1. The other variables had low factor loadings ranging from .325 to .473. As such, PMF1 was named ‘absorbed enjoyment’, just as the other factors examined before.

PMF2 had an Eigenvalue of 4.554 which accounted for variance of 13.01%. It had a total of 15 variables loaded on, manifesting the dimensions of concentration (18, 19, 20, 21), sense of control (29, 30, 31), unambiguous feedback (9, 10, 24), challenge-skill balance (2, 3), action-awareness merging (28, 34) and clear goals (8). Six of the variables had high loadings ranging from .519 to .704, marking the dimensions of unambiguous feedback (9, 10), sense of control (30, 31), challenge-skill balance (2) and action-awareness merging (28) as being prominent. The other variables had low loadings ranging from .333 to .477. As the flow precedents of

challenge-skill balance and unambiguous feedback were prominent here, it seemed likely that teacher input both in terms of preparing the activity and feedback provided was a key influence in this factor. Allied to the strong presence of dimensions that reflected the students' immersion in the activities (sense of control, and action-awareness merging), PMF2 appeared to suggest that teacher inputs had some bearing on the students' sense that they were in control and were thus immersed in the activities. This could be consistent with the sense of confidence felt by students who had prior music experience when they engaged in musical activities they found within their capabilities. PMF2 was therefore named 'guided confidence'.

PMF3 had an Eigenvalue of 3.306 accounting for total variance of 9.445%. There were eight variables loaded for the dimensions of clear goals (5, 24, 25), unambiguous feedback (22, 23), autotelic experience (15), sense of control (31) and concentration (21). All the variables with high loadings were for clear goals and unambiguous feedback, ranging from .527 to .768, while the other three variables had low loadings of .332 to .306. Clear goals and unambiguous feedback were clearly the prominent dimensions in PMF3 and therefore named 'co-operation and communication'.

The Eigenvalue for PMF4 was 2.963 accounting for 8.465% of variance. Eleven variables were loaded, accounting for the dimensions of clear goals (5, 7, 8, 25), challenge-skill balance (3, 4), concentration (19, 20), loss of self-consciousness (35), sense of control (30) and unambiguous feedback (9). Four variables had high loadings: two for clear goals (7, 8), one for loss of self-consciousness (35) and one for challenge-skill balance, with values ranging from .531 to .738, while the other variables had low loadings ranging from .302 to .406. With the flow precedent dimensions of challenge-skill balance and clear goals prominent, teacher preparation would appear to be important for PMF4 but with the added dimension of loss of self-consciousness. This would appear to suggest that when the activities had been well-planned and executed, the students might become so absorbed that they would not be concerned about how they were perceived. PMF4 was therefore named 'prepared immersion'.

PMF5 had an Eigenvalues of 2.517, accounting for variance of 7.191%. A total of six variables were loaded, reflecting the dimensions of loss of self-consciousness (32, 33, 35), action-awareness merging (34), concentration (20) and sense of control (31). The variables with high loadings were for loss of self-consciousness (32, 33) and action-awareness merging (34) with values ranging from

.536 to .806, while the other variables had low loadings ranging from .323 to .457. Loss of self-consciousness and action-awareness merging were therefore the most prominent dimensions and, as with other factors analysed earlier with similar flow characteristics, PMF5 was named ‘unconscious action’.

8.8.1 Discussion of factor loadings of cohort of primary school students with prior music experience data

Eight of the nine flow dimensions loaded onto the five factors for the cohort of primary school students with prior music experience, with concentration being left out. Autotelic experience and time transformation were again the highest-ranked dimensions, accounting for 19.491% variance. The flow precedents of challenge-skill balance, clear goals and unambiguous feedback would also appear to also be quite important, being prominent in three of the remaining four factors and each dimension also prominent in two of the three factors. This cohort of students also appeared to be more immersed in the musical activities, given the strong presence of sense of control, loss of self-consciousness and action-awareness merging. This could again be another allusion to their prior music experience allowing them to be more engaged in the activities.

Regarding the missing flow dimension, it was noted upon examining Table 8.14 that four of the variables for concentration (18, 19, 20, 21) did load onto four of the factors, but none above the high loading threshold of .5, while variable 17 (‘During music class I am not distracted’) did not load onto any factor at all. What this could mean was that the students with prior music experience may not have maintained high levels of concentration during the music classes. This could be due to their prior music experience giving them the confidence so that even without their full attention they seemed to be able to handle the musical tasks. Another possible angle of looking at this was that students with prior music experience did not find the activities particularly difficult but were quite naturally engaged nevertheless and enjoyed the music-making experiences. If so, this would challenge Csikszentmihalyi’s belief that in flow, boredom would ensue when the activities were not sufficiently challenging for the participants.

It was further noted that two other variables also did not load onto any of the factors: variable 1 (‘I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge’) and 6 (‘Clear targets are set for us in music class’). While this may not have had much impact on the overall importance of their

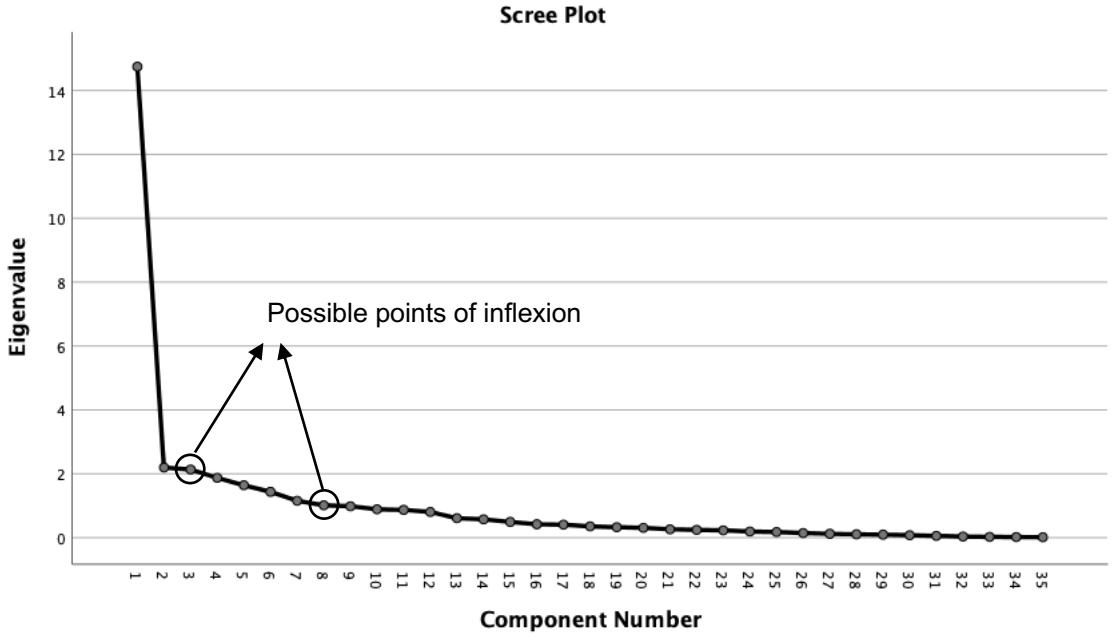
respective dimensions (challenge-skill balance and clear goals respectively), it was arguable their absence added credence to the earlier observation that the primary school students with prior music experience may not have found the activities particularly challenging, even when they perceived that there was a lack of clearly-defined activity objectives.

8.9 ANALYSIS OF SECONDARY SCHOOL COHORT DATA OF STUDENTS WITHOUT PRIOR MUSIC EXPERIENCE

Exploratory factor analysis was conducted on the data from the 35 items gathered from the secondary school students without prior music experience (SNM). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was applied to the SNM sample (N = 52) to test for sampling adequacy. The analysis revealed that KMO = .719, above the recommended value of .5, verifying the adequacy for the SNM sample. As the SNM sample size of 52 was low (<100), it was necessary to check that the communalities for the variables were sufficiently high (>.6) to ensure that the factor analysis was not adversely impacted (de Winter, Dodou, & Wieringa, 2009; MacCallum, Widaman, Zhang, & Hong, 1999). It was found that the communalities for all 35 variables ranged from .614 to .857, exceeding the minimum required.

Principal component analysis was used as the method of extraction with varimax rotation and the outcome for the combined dataset is set out in Appendix 14. Using an Eigenvalue threshold of 1, eight factors were extracted. Reference was made to the scree plot for the dataset (ref. Table 8.15) to check the viability of an eight-factor solution:

Table 8.15: Scree plot for secondary school students without prior music experience data factor analysis



Based on the scree plot, a first possible point of inflexion suggested a two-factor solution. However, this was rejected due to the risk of under-reporting the factors. A second possible point of inflexion suggested a seven-factor solution, which would appear to be more viable. Based on Appendix 14, the seven factors accounted for a total variance of 68.049%.

Table 8.16: Secondary school data of students without prior music experience rotated component matrix

Rotated Component Matrix

	Component						
	1	2	3	4	5	6	7
2. I would be able to do more difficult topics than what is taught in music class.	.858						
8. During music class I have a strong sense of what I want to do.	.708	.301	.388				
1. I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.	.642						
4. My abilities match the difficulty of what we do in music class.	.640						
3. I feel I have the knowledge needed to understand what is taught in music class.	.617	.394					

34. During musical activities, I do things automatically without having to think.	.614		.454				
10. It is always clear to me when I am doing well in music class.	.487				.419		
9. I can tell how well I am doing during music class.	.476				.360		.468
31. I have a feeling of control when participating in musical activities.	.472			.386			
11. I enjoy learning at music class.		.685					
14. Overall I find taking part in music class an extremely rewarding experience.		.677					
12. I love the feeling I get after music class and want to capture it again.	.314	.676		.435			
15. 1 find what I learn in music class interesting.		.629				.398	
26. I am so absorbed in the activities in music class that I do not realise time has passed.		.585	.553				
13. Taking part in music activities leaves me feeling great.		.579	.402	.369			
29. During musical activities, I feel in total control of what I am doing.			.776				
27. It feels like time flies during music class.		.459	.695				
21. When listening to the music teacher, I am so interested that I am unaware of what is going on around me that is not related to the music class.			.584				
19. During music class, I focus on the activities and do not do other things that have nothing to do with the class.			.557			.545	
28. During musical activities in class, I play/sing the correct notes without hesitation.			.539		.487		
20. During music class, I am totally focused on the music making experience.			.458	.316			
23. I am good at exchanging ideas with my classmates and doing group work in music class.				.805			
30. I feel I can control what I am doing in music class.	.429			.643			.316
25. I work with classmates to cope with tasks or projects required by the music course.		.418		.562			
22. When I need help I ask the teacher.					.725		

24. When the teacher or another classmate asks a question that I know the answer to, I will say so and respond				.535	.614		
33. During musical activities, I am not concerned with how I present myself.	.379				.606		
17. During music class I am not distracted.						.691	.350
16. Music classes are not boring.		.518				.680	
18. When someone disturbs the music class I am not happy.			.462			.596	
6.Clear targets are set for us in music class.					.379	.313	.662
5. I know what I want to achieve out of music class.			.400				.652
7. I know clearly what is expected of me in music class.		.338		.360		.301	.615
32. During musical activities, I am not concerned with what others may have been thinking of me.	.337						
35. During music class, I am not worried about how well I do as long as I know I am doing my best.	.384			.338			

The rotated factor loadings for the combined data based on the seven-factor solution are at Table 8.16, in which factor loadings of more than .3 are reflected.

Secondary Non-Music Factor 1 (SNF1), had a total of 14 variables loaded, accounting for 14.141% of variance had an Eigenvalue of 4.949. The flow dimensions reflected were challenge-skill balance (1, 2, 3, 4), unambiguous feedback (10, 12), loss of self-consciousness (32, 33, 35), sense of control (30, 31), clear goals (8), action-awareness merging (34) and autotelic experience (12). The high loading variables were for the dimensions of challenge-skill balance (1, 2, 3, 4), clear goals (8) and action-awareness merging (34). There were six variables with high loadings: four for challenge-skill balance (1, 2, 3, 4), one for clear goals (8) and one for action-awareness merging (34), with values ranging from .614 to. 858. The remaining eight variables had loadings ranging from .314 to .487. It could therefore be said that the prominent flow dimensions in SNF1 were challenge-skill balance, clear goals and action-awareness merging, which highlighted the element of lesson preparation, and action-awareness merging. As such, this factor was named ‘prepared absorption’.

SNF2 had an Eigenvalue of 4.108, which accounted for total variance of 11.737%. 12 variables were found to have loaded onto SNF2, which reflected the dimensions of autotelic experience (11, 12, 13, 14, 15, 16), clear goals (7, 8, 25) time transformation (26, 27), and challenge-skill balance (3). Six of the variables had high loadings ranging from .518 to .685 for the flow dimensions of autotelic experience (11, 12, 13, 14, 15, 16) and time transformation (26), which also had another variable with a relatively high loading of .459 (27). The rest of the variables had low loadings ranging from .301 to .418. The most prominent dimensions in this factor were therefore autotelic experience and time transformation and SNF2 was named 'absorbed enjoyment'.

With an Eigenvalue of 4.085, SNF3 accounted for total variance of 11.737%. A total of 12 variables were loaded, manifesting the dimensions of concentration (18, 19, 20, 21), time transformation (26, 27), clear goals (5, 8), action-awareness merging (28, 34), sense of control (29) and autotelic experience (13). With values ranging from .539 to .776, a total of six variables reflected high loadings for the dimensions of concentration (19, 21), time transformation (26, 27), sense of control (29) and action-awareness merging (28). The other variables had low loadings ranging from .388 to .462. For SNF3, it was noted that the four prominent flow dimensions were came from the five dimensions of the 'flow process' cluster, less loss of self-consciousness. The sense conveyed by the wording of the variables appeared to reflect the deep engagement experienced by the students during the task when in flow. As such, SNF3 was named 'task focus'.

SNF4 had an Eigenvalue of 3.04 accounting for total variance of 8.685%. It had a loading of 10 variables covering the dimensions of clear goals (7, 24, 25), sense of control (30, 31), autotelic experience (13, 14), unambiguous feedback (23), concentration (20) and loss of self-consciousness (35). Four variables had high loadings for the dimensions of clear goals (24, 25), unambiguous feedback (23) and sense of control (30) ranging from .535 to .803, with the other low loading variables having values ranging from .316 to .435. With the prominent dimensions being clear goals, unambiguous feedback and sense of control, SNF4 was named 'controlled co-operation and communication'.

SNF5 had an Eigenvalue of 2.624 with a total variance of 7.498%. Seven variables loaded onto SNF5, accounting for the dimensions of unambiguous feedback (9, 10, 22), clear goals (6, 24), loss of self-consciousness (33) and action-awareness merging (28). The high-loading variables were found in unambiguous

feedback (22), clear goals (24) and loss of self-consciousness (33) ranging from .606 to .725, while the low-loading variables ranged from .36 to .487. The key dimensions for SNF5 were therefore unambiguous feedback, clear goals and loss of self-consciousness. This factor was therefore named 'absorbed co-operation and communication'.

SNF6 had seven variables loaded onto it with an Eigenvalue of 2.551 accounting for variance of 7.289%. The flow dimensions manifested were concentration (17, 18, 19), autotelic experience (15, 16), and clear goals (6, 7). High-loading variables were found for concentration (17, 18, 19) and autotelic experience (16), with values ranging from .545 to .691, while the low-loading variables ranged from .301 to .398. Concentration and autotelic experience were therefore the pre-eminent dimensions and SNF6 was named 'focused enjoyment'.

The Eigenvalue of SNF7 was 2.46, accounting for 7.028% of variance. A total of six variables were loaded, reflecting the dimensions of clear goals (5, 6, 7), unambiguous feedback (9), concentration (17) and sense of control (30). The one prominent flow dimension manifested in SNF7 was clear goals, with its three variables having values ranging from .615 to .662, while the other low-loading variables ranged from .316 to .468. SNF7 was therefore named 'clear goals'.

8.9.1 Discussion of factor loadings of cohort of secondary school students without prior music experience data

All of the nine flow dimensions were found to have loaded onto the seven factors of the secondary school cohort without prior music experience. Examining the order of the factors, the highest loading dimensions for this cohort would appear to be challenge-skill balance, clear goals and action-awareness merging. This was followed by the dimensions of autotelic experience and time transformation. This would therefore be the first instance in the cohorts examined thus far in which the dimensions of autotelic experience and time transformation were not ranked as the most prominent.

It was noted that the flow precedent dimensions loaded onto four of the factors, and clear goals was found to have manifested in all four. This would appear to allude both to the importance of clear goals in the students' flow experiences (it also manifested as a factor in itself, albeit the lowest-ranked factor) and also that it was a key feature in their music lessons. This could in turn imply that the secondary school teachers had made efforts to explain the objectives and/or intended outcomes

of the lessons. In the wider analysis, the recurrence of the flow precedent dimensions could also suggest that the students had been impressed by the teachers' efforts at lesson preparation and also the feedback provided during the lesson, possibly both by teachers and their peers. It was further noted that clear goals and unambiguous feedback, which make up the factor 'co-operation and communication', loaded together in two of the factors, albeit with each factor having an additional dimension. This could imply that there were group activities during music class in which students would have to work together or hinted at there being considerable interactions between students and teachers.

The factor 'task focus' also drew attention as it was the factor that shared the distinction of having the greatest number of dimensions, four, and that all four were part of the 'flow process'. The only 'flow process' dimension not found in 'task focus' was time transformation. This could imply that when the students experienced flow, they were not able to distinguish the different elements of the flow process, apart from time transformation, which could be explained by the fact that it was a concept that was not difficult to comprehend and hence easier for the students to discern and articulate from the experience. As with all the other cohorts, the secondary school students with no prior music experience tended to closely associate time transformation with autotelic experience, i.e. enjoy themselves to the point that they lost track of time.

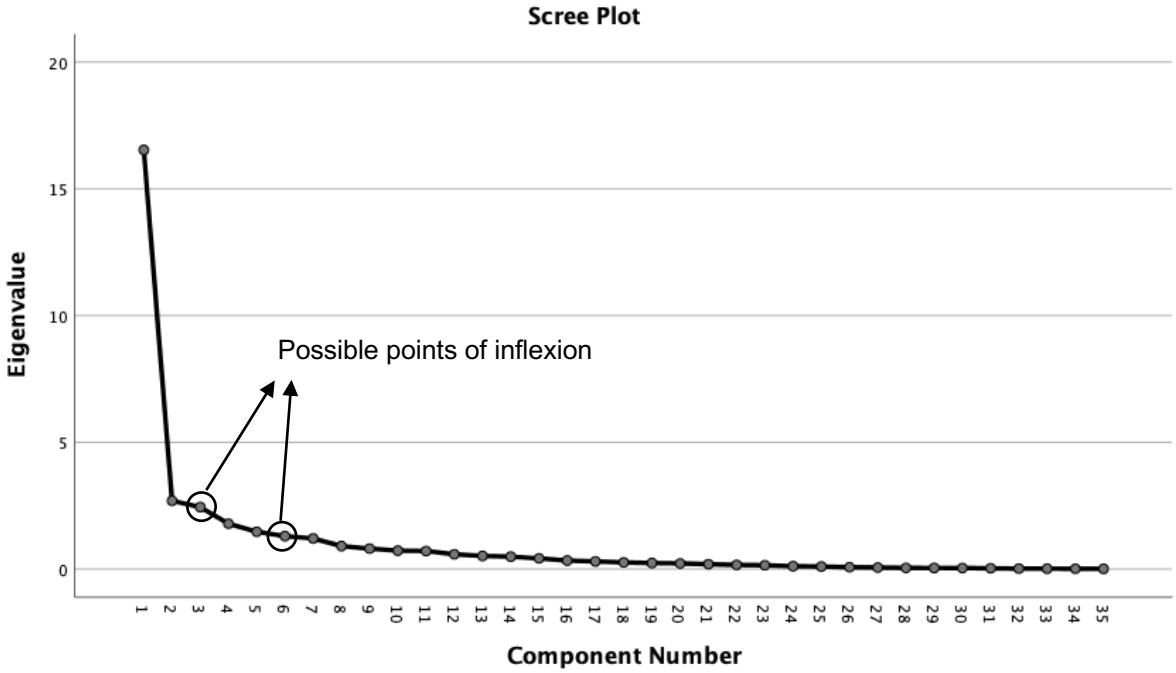
8.10 ANALYSIS OF SECONDARY SCHOOL COHORT DATA OF STUDENTS WITH PRIOR MUSIC EXPERIENCE

Exploratory factor analysis was conducted on the data from the 35 items gathered from the secondary school students without prior music experience (SM). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was applied to the SM sample (N = 42) to test for sampling adequacy. The analysis revealed that KMO = .733, above the recommended value of .5, verifying the adequacy for the SM sample. As the SM sample size of 42 was low (<100), it was necessary to check that the communalities for the variables were sufficiently high (>.6) to ensure that the factor analysis was not adversely impacted. It was found that the communalities for all 35 variables ranged from .616 to .873, exceeding the minimum required.

Principal component analysis was used as the method of extraction with varimax rotation and the outcome for the combined dataset is set out in Appendix 15. Using an Eigenvalue threshold of 1, seven factors were extracted. Reference was

made to the scree plot for the dataset (ref. Table 8.17) to check the viability of a seven-factor solution:

Table 8.17: Scree plot for secondary school students with prior music experience data factor analysis



Based on the scree plot, a first possible point of inflexion suggested a two-factor solution. However, this was rejected due to the risk of under-reporting the factors. A second possible point of inflexion suggested a five-factor solution, which would appear to be more viable. Based on Appendix 15, the five factors accounted for a total variance of 67.687%.

Table 8.18: Secondary school data of students with prior music experience rotated component matrix

Rotated Component Matrix

	Component				
	1	2	3	4	5
14. Overall I find taking part in music class an extremely rewarding experience.	.811				
26. I am so absorbed in the activities in music class that I do not realise time has passed.	.761	.434			
11. I enjoy learning at music class.	.746				.307
13. Taking part in music activities leaves me feeling great.	.739				
30. I feel I can control what I am doing in music class.	.714		.440		

20. During music class, I am totally focused on the music making experience.	.711	.315			
15. 1 find what I learn in music class interesting.	.692				.382
27. It feels like time flies during music class.	.684				.343
16. Music classes are not boring.	.676				.545
17. During music class I am not distracted.	.653				
25. I work with classmates to cope with tasks or projects required by the music course.	.595	.341	.332		
9. I can tell how well I am doing during music class.	.450		.440	.315	
19. During music class, I focus on the activities and do not do other things that have nothing to do with the class.	.400	.356			.317
33. During musical activities, I am not concerned with how I present myself.		.869			
34. During musical activities, I do things automatically without having to think.		.740			
31. I have a feeling of control when participating in musical activities.	.365	.727		.308	
28. During musical activities in class, I play/sing the correct notes without hesitation.	.365	.712		.324	
32. During musical activities, I am not concerned with what others may have been thinking of me.		.661		.358	.386
35. During music class, I am not worried about how well I do as long as I know I am doing my best.	.466	.642			.388
4. My abilities match the difficulty of what we do in music class.			.828		
2. I would be able to do more difficult topics than what is taught in music class.			.787		
3. I feel I have the knowledge needed to understand what is taught in music class.			.785		
8. During music class I have a strong sense of what I want to do.	.514		.552		.433
24. When the teacher or another classmate asks a question that I know the answer to, I will say so and respond				.781	
22. When I need help I ask the teacher.				.758	

12. I love the feeling I get after music class and want to capture it again.	.494			.613	
23. I am good at exchanging ideas with my classmates and doing group work in music class.		.311	.452	.598	
29. During musical activities, I feel in total control of what I am doing.	.410	.412	.368	.425	
6.Clear targets are set for us in music class.		.327		.320	.735
7. I know clearly what is expected of me in music class.			.439		.671
5. I know what I want to achieve out of music class.	.348		.447		.525
1. I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.					
18. When someone disturbs the music class I am not happy.	.354				
10. It is always clear to me when I am doing well in music class.	.376	.399	.329		
21. When listening to the music teacher, I am so interested that I am unaware of what is going on around me that is not related to the music class.	.368	.324			

The rotated factor loadings for the combined data based on the five-factor solution are at Table 8.18, in which factor loadings of more than .3 are reflected. For small samples (<50), higher variable loadings were recommended to be considered prominent in each factor (Field, 2013). While Field had recommended a threshold loading of .7 be used, I heeded the warning provided by de Winter et al. (2009) that an adequate number of variables needed to be retained to be able explain the factor. Considering the factor loadings for this cohort, the threshold loading for this cohort was consequently set to .6. The communalities for the variables were also checked and it was confirmed that all were >.6, ranging from .616 to .873.

Secondary Prior Music Factor 1 (SMF1) had an Eigenvalue of 8.026 accounting for variance of 22.933%. A total of 23 variables loaded, reflecting the dimensions of autotelic experience (11, 12, 13, 14, 15, 16), concentration (17, 18, 19, 20, 21), sense of control (29, 30, 31), clear goals (5, 8, 25), time transformation (26, 27), unambiguous feedback (9, 10), loss of self-consciousness (35), and action-awareness merging (28). The variables with high loadings for the dimensions of autotelic experience (11, 13, 14, 15, 16), time transformation (26, 27), concentration

(17, 20) and sense of control (30), with values ranging from .653 to .811, making them the prominent flow dimensions for SMF1; the other variables had loadings from .348 to .595. With the dimensions of autotelic experience and time transformation both loading strongly here, there were similarities with the factor ‘absorbed enjoyment’ that has manifested in all the other factors. The added dimensions of concentration and sense of control give the factor a strong element of focus, which also compliments time transformation, and control. SMF1 was therefore named ‘focused enjoyment with control’ to differentiate it from the earlier factor ‘focused enjoyment’.

The Eigenvalue for SMF2 was 4.948, accounting for variance of 14.136%. It had a total of 15 variables loaded on, accounting for the dimensions of loss of self-consciousness (32, 33, 35), concentration (19, 20, 21), action-awareness merging (28, 34), clear goals (6, 25), unambiguous feedback (10, 23), sense of control (29, 31) and time transformation (26). The variables with strong loadings were found in the dimensions of loss of self-consciousness (32, 33, 35), action-awareness merging (28, 34) and sense of control (31), with values ranging from .642 to .869 while the other variable loadings ranged from .311 to .434. It was noted that there was a wide gap between the higher and lower range of variables of .208, possibly attesting to the prominence of the high loading dimensions in this factor. The prominence of loss of self-consciousness and action-awareness merging suggested similarities with the factor ‘unconscious action’, but with some added element of control. SMF2 was therefore named ‘controlled unconscious action’.

SMF3 had an Eigenvalue of 4.223, which accounted for 12.065% variance, with a total of 12 variables loaded. These accounted for the dimensions of challenge-skill balance (2, 3, 4), clear goals (5, 7, 8, 25) unambiguous feedback (9, 10, 23) and sense of control (29, 30). Only one dimension was found to be prominent for SMF3, namely challenge-skill balance, with all three high-loading variables (2, 3, 4), values ranging from .785 to .828. The other variables had loadings ranging from .329 to .552. It was noted that the other flow precedent dimensions, namely clear goals and unambiguous feedback, also loaded in SMF3 but not to any degree of prominence, with the possible exception of variable 8 for clear goals, which had a value of .552. With no other dimensions prominent, SMF3 was therefore named ‘challenge-skill balance’.

With an Eigenvalue of 3.417 accounting for variance of 9.762%, a total of ten variables loaded onto SMF4, accounting for the dimensions of unambiguous

feedback (9, 22, 23), clear goals (6, 24), sense of control (29, 31), autotelic experience (12), loss of self-consciousness (32) and action-awareness merging (28). The high-loading variables were found in unambiguous feedback (22), clear goals (24) and autotelic experience (12), with values ranging from .613 to .781. Variable (23) for unambiguous feedback could arguably be considered as high-loading as it had a value of .598, very near to the threshold of .6. With the dimensions of unambiguous feedback and clear goals prominent, SMF4 shared some similarities with the factor 'co-operation and communication', but with some element of enjoyment. It was therefore named 'enjoyment through co-operation and communication'.

SMF5 had an Eigenvalue of 3.077 and accounted for variance of 8.791%. A total of 11 variables loaded on, manifesting the dimensions of clear goals (5, 6, 7, 8), loss of self-consciousness (32, 35), autotelic experience (11, 15, 16), concentration (19) and time transformation (27). Both the high-loading variables loaded onto clear goals (6, 7), with values of .671 and .735, while the other variables had loadings ranging from .307 to .545. SMF5 was therefore named 'clear goals'.

8.10.1 Discussion of factor loadings of cohort of secondary school students with prior music experience data

All of the nine flow dimensions were found to have loaded onto the five factors of the secondary school cohort without prior music experience. Examining the order of the factors, the highest loading dimensions for this cohort would be autotelic experience, time transformation, sense of control and concentration, followed by loss of self-consciousness and action-awareness merging. The flow precedent dimensions of challenge-skill balance, clear goals and unambiguous feedback were also prominent in the third and fourth factors, which alluded to the quality of teacher preparation and feedback. It was noted that for this cohort of students, all the five flow process dimensions of concentration, sense of control, action-awareness merging, loss of self-consciousness and time transformation were ordered ahead of the flow precedent dimensions, which could be an indication of the students' greater engagement in the musical activities.

Comparing the factor analysis results for this cohort with that for the secondary cohort without prior music experience, it would appear that the students with prior music experience enjoyed their music lessons more. This cohort of students also seemed more 'immersed' in their music-making experiences, as

evidenced by the stronger presence of the flow process dimensions. They also seemed to be more confident in handling the musical activities, given the prominence of sense of control in both the first and second-ranked factors, and were also more focused. Both these observations would be consistent with students who, as a result of their greater musical mastery, were better able to handle the musical tasks given in class. Comparatively, while clearly important given their presence in the third and fourth factors, the flow precedent dimensions would seem to matter somewhat less to the secondary school students with prior music experience as compared to their secondary school non-music peers. It was also noted that clear goals loaded as an independent factor for this cohort as well (albeit as the last), mirroring its occurrence in the non-music cohort.

8.11 SUMMARY OF FINDINGS

The findings for this chapter are summarised in Table 8.19:

Table 8.19: Summary of findings factor analysis

Primary school cohort			
Factor	Name	Prominent dimensions	Remarks
PF1	Absorbed enjoyment	Autotelic experience Time transformation	
PF2	Flow preparation	Challenge-skill balance Clear goals Unambiguous feedback	
PF3	Co-operation and communication	Clear goals Unambiguous feedback	
PF4	Holistic flow experience	Clear goals Challenge-skill balance	7 dimensions loaded with narrow loading range
PF5	Unconscious action	Action-awareness merging Loss of self-consciousness	
PF6	Weak concentration	Concentration	4 variables but only 1 with high loading
PF7	Diffused concentration	Concentration	• Concentration loaded 4 out of 6 variables • only 1 high loading .699 • Clear goals had negative loading
Secondary school cohort			
Factor	Name	Prominent dimensions	Remarks
SF1	Absorbed enjoyment	Autotelic experience Time transformation	
SF2	Flow preparation	Challenge-skill balance Clear goals Unambiguous feedback	

SF3	Dominant concentration	Concentration Sense of control	• 7 dimensions manifested • 5 high loading variables – 4 for concentration 1 for sense of control
SF4	Unconscious action	Action-awareness merging Loss of self-consciousness	
SF5	Co-operation and communication	Unambiguous feedback Clear goals	
SF6	Guided enjoyment	Clear goals Autotelic experience Concentration	Additional high loading variable for autotelic experience (.496) was considered

Combined primary and secondary school cohort

Factor	Name	Prominent dimensions	Remarks
CF1	Absorbed enjoyment	Autotelic experience Time transformation	
CF2	Controlled flow preparation	Challenge-skill balance Clear goals Unambiguous feedback (Sense of control)	2 high-loading variables for sense of control (.456 and .457) were considered
CF3	Co-operation and communication	Clear goals Unambiguous feedback	
CF4	Unconscious action	Action-awareness merging Loss of self-consciousness	
CF5	Clear concentration	Concentration	Single dimension factor
CF6	Focused clear goals	Clear goals	Single dimension factor

Combined primary and secondary cohort without prior music experience

Factor	Name	Prominent dimensions	Remarks
CNF1	Calibrated absorbed enjoyment	Autotelic experience Time transformation Challenge-skill balance	
CNF2	Guided actions	Challenge-skill balance Clear goals (action-awareness merging)	2 high-loading variables from action-awareness merging (.463, .407) considered
CNF3	Guided focus	Clear goals Unambiguous feedback Concentration	
CNF4	Unconscious action	Action-awareness merging Loss of self-consciousness	
CNF5	Guidance	Clear goals Unambiguous feedback	All 7 variables loaded into the 2 dimensions

Combined primary and secondary cohort with prior music experience

Factor	Name	Prominent dimensions	Remarks
CMF1	Absorbed enjoyment	Autotelic experience Time transformation	
CMF2	Focused confidence	Concentration Sense of control Unambiguous feedback Action-awareness merging	Factor with the most number of dimensions with strong loadings (4) together with SNF3
CMF3	Planning	Challenge-skill balance Clear goals	
CMF4	Co-operation and communication	Clear goals Unambiguous feedback	

CMF5	Unconscious action	Action-awareness merging Loss of self-consciousness	
Primary school cohort without prior music experience			
Factor	Name	Prominent dimensions	Remarks
PNF1	Absorbed enjoyment	Autotelic experience Time transformation	
PNF2	Focused co-operation and communication	Clear goals Unambiguous feedback Concentration	
PNF3	Challenge-skill balance	Challenge-skill balance	Single dimension factor
PNF4	Planning	Clear goals Challenge-skill balance	
PNF5	Concentration	Concentration	Single dimension factor
Primary school cohort with prior music experience			
Factor	Name	Prominent dimensions	Remarks
PMF1	Absorbed enjoyment	Autotelic experience Time transformation	
PMF2	Guided confidence	Challenge-skill balance Unambiguous feedback	
PMF3	Co-operation and communication	Clear goals Unambiguous feedback	
PMF4	Planned immersion	Challenge-skill balance Clear goals Loss of self-consciousness	
PMF5	Unconscious action	Action-awareness merging Loss of self-consciousness	
Secondary school cohort without prior music experience			
Factor	Name	Prominent dimensions	Remarks
SNF1	Prepared absorption	Challenge-skill balance Clear goals Action-awareness merging	Only instance in which neither autotelic experience nor time transformation (‘absorbed enjoyment’) was prominently manifested in the first factor in some form
SNF2	Absorbed enjoyment	Autotelic experience Time transformation	
SNF3	Task focus	Concentration Time transformation Sense of control Action-awareness merging	Only instance of any factor manifesting 4 out of the 5 flow process dimensions
SNF4	Controlled co-operation and communication	Clear goals Unambiguous feedback Sense of control	
SNF5	Absorbed co-operation and communication	Clear goals Unambiguous feedback Loss of self-consciousness	
SNF6	Focused enjoyment	Concentration Autotelic experience	
SNF7	Clear goals	Clear goals	Single dimension factor in which all 3 variables loaded onto
Secondary school cohort with prior music experience			

Factor	Name	Prominent dimensions	Remarks
SMF1	Focused enjoyment with control	Autotelic experience Time transformation Concentration Sense of control	
SMF2	Controlled unconscious action	Loss of self-consciousness Action-awareness merging Sense of control	
SMF3	Challenge-skill balance	Challenge-skill balance	Single dimension factor
SMF4	Enjoyment through co-operation and communication	Clear goals Unambiguous feedback Autotelic experience	
SMF5	Clear goals	Clear goals	Single dimension factor

CHAPTER 9 – DISCUSSION

9.1 INTRODUCTION

This study explored the flow phenomenon in the Singaporean primary and secondary school music classroom in terms of how it manifested and how the students experienced it, if at all. The decision was made to focus this study of flow on the students in the 'generalist' context of the Globe Model of Music Education rather than those in the 'specialist' context (North & Hargreaves, 2008) to gain a better understanding of these experiences so as to enrich the research on how flow can be harnessed to enhance students' musical learning. Flow has been said to be a key predictor of heightened student engagement in schools and its presence in the music classroom could engender greater interest and intrinsic motivation among students to learn music or engage in musical activities (O'Neill, 1999; Shernoff & Csikszentmihalyi, 2009). Maintaining this continuing motivation could lead to students sustaining their interest in lifelong musical learning and engagement, cultivate positive learning dispositions (Miksza & Tan, 2015) which would be important enablers in MOE's overall efforts to cultivate in students a positive disposition towards learning for life.

This chapter brings together the findings from the various data analyses conducted in order to answer the following research questions:

(1) Do primary five and secondary one students in Singapore experience flow or some iteration of flow during their regular school music classes?

(2) If so, what is the nature of their flow experiences?

(3) Do the flow experiences of primary five and secondary one students differ, and if so how?

(4) Do the flow experiences differ between students with and without additional musical learning experiences either within or outside the school context?

(5) How do the music teachers impact students' flow experiences?

In the tradition of mixed method research, I will draw inferences to make sense of the disparate findings from the different data sources (Teddlie & Tashakkori, 2009) while referring to the literature to discuss the implications on how these findings potentially impact classroom music learning in the Singaporean context. At the end of this chapter, some recommendations are proposed on how this research could inform educational practices, and limitations of the research are set out.

9.2 QUESTION 1

Do primary 5 and secondary 1 students experience flow or some iteration of flow during their regular school music classes?

The presence of flow as articulated by Csikszentmihalyi (1975, 1990) is defined by the presence of its nine dimensions: challenge-skill balance, clear goals, unambiguous feedback (the three 'flow precedent' dimensions), concentration, sense of control, action-awareness merging, loss of self-consciousness, time transformation (the five 'flow process' dimensions) and autotelic experience ('flow outcome'). From the overall analysis conducted on the quantitative data obtained through the questionnaire, it would appear that some form of flow did take place in the classroom for the combined primary and secondary school cohort, evidenced by the relatively high overall mean flow score of 3.67 (>3.5 on a five-point Likert scale), and seven of the mean scores for the individual dimensions being more than 3.5, with unambiguous feedback (3.48) and action-awareness merging (3.34) the dimensions having lower scores. These findings were echoed for the student cohort from the primary school level, with an overall mean flow score of 3.7 and seven of the mean flow scores by dimension scoring >3.5, except for unambiguous feedback (3.46) and action-awareness merging (3.38). The measurements for the secondary school cohort told a slightly different tale. The overall mean flow score was lower, though still >3.5, at 3.59 and three dimensions had scores lower <3.5, namely concentration, loss of self-consciousness (both 3.44) and action-awareness merging (3.22). This was comparable to the quantitative findings of the study in Wrigley and Emmerson (2013), in which the five-point Likert mean scores of 236 conservatory music students when performing had an overall mean flow score of 3.51 and ranged from 3.12-4.12 by flow dimension.

Drawing from the three sources of data, the nature of the primary and secondary school students' experience for each flow dimension will be examined and compared.

9.2.1 AUTOTELIC EXPERIENCE

Autotelic experience was, without question, the most prominent flow dimension experienced by the students, quantitatively ranking the highest for both the primary and secondary school cohorts with scores of 4.05 and 3.94 respectively. This was also supported in the qualitative data, in which both cohorts of students were unanimous in speaking enthusiastically of how much they liked music and

enjoyed musical activities. Given flow's association with enjoyment, its pervasiveness provided support for the presence of flow in the classroom. This was supported by findings from the study by Wrigley and Emmerson (2013), where autotelic experience was also found to be one of the strongest contributors to the flow experience of music students despite the research taking place in the context of students' performance exams, which the researchers admitted may not have been most conducive to flow. What was also important was that the students' dicta from the focus groups made clear that their enjoyment was not of a superficial kind referred to as 'pleasure', and was of the kind that came about because of their efforts to learn and would lead to psychological growth (Csikszentmihalyi, 1990). This was important in the context of music education as this was the sort of growth that music was thought to be a natural platform for engendering that could lead to human flourishing (Elliott & Silverman, 2015).

The video observations also supported the notion of enjoyment in the music classes. The primary school students clearly enjoyed and were engaged in their musical activities, e.g., the students' participation in the catch and sing activity in PS2 was spontaneous, enthusiastic and accompanied by copious amounts of laughter. The case for the secondary school students was less clear cut, e.g., while there was also laughter in the SS3 observation, the students were laughing at the instructor's jokes rather than enjoying the activity itself, though they did appear to be concentrating on what the instructor was saying. Similarly, the students in SS2 were observed to be most engaged when watching the teachers' musical demonstrations but when asked to sing, appeared less engaged as shown by their muted singing despite the best efforts of the teachers. This was in contrast to the students of PS1, who were observed to be focused on what the teacher was saying and sang loudly and clearly. The observations therefore corroborated the quantitative findings that of a .11 difference between autotelic experience scores of the primary and secondary school cohorts, though it should be noted that the difference was not found to be significant.

Overall, these findings supported the contention that students got less interested or became less engaged in music lessons as they advanced through the academic levels (Lowe, 2011).

9.2.2 CHALLENGE-SKILL BALANCE

With a score of 3.65, challenge-skill balance was ranked as the fifth most prominent flow dimension for the primary school students. This compared with a score of 3.52 and a ranking of sixth for the secondary school students, which would suggest that its relative prominence was comparatively similar for both cohorts of students. Its presence in the music classes was very much observed in the video observations, e.g., the music teacher in PS2 broke the activity into stages to ease students into the catching and singing activity. The lack of prominence of challenge-skill balance in the overall flow experience was corroborated by the qualitative data, where students both with and without prior music experience generally found their music lessons lacking challenge. While some musical activities such as instrumental playing may initially pose some challenge for the students, it often did not take long for them to get to grips with it and would be able to accomplish them. This was also evidenced in the video observations, e.g. in the PS1 observation, it took the students just a few minutes to sort out the sequencing and anticipation needed to play a simple melody on the handbells.

The importance of challenge-skill balance as an enabler of flow in the education context has already been emphasised (Shernoff et al., 2003). The expending of psychic energy to overcome the challenges leads to the increased complexity of the consciousness, and hence personal growth (Elliott & Silverman, 2015). Its relatively weak presence in both cohorts would appear to suggest that the students were not being sufficiently challenged. While it had appeared that the students' enjoyment of musical activities had been found to be of the type that suggested there was psychological growth (see previous section on 'autotelic experience'), there was room for classroom music activities to be more challenging to stretch students and further support their self-growth.

9.2.3 CLEAR GOALS

Clear goals ranked as the third most prominent dimension for both the primary and secondary school cohorts, with scores of 3.71 and 3.66 respectively. It was clearly manifested in the classroom, with students from both cohorts stating that their teachers were constantly reminding them of what the lesson/activity objectives were. This was also clear from the video observations, where the teachers in all four primary and secondary school lessons were observed setting out the lesson

objectives at the start of the class and then constantly repeating them as the respective activities progressed.

The pursuit of realistic goals is key to flow experiences as it provides the clarity for the person to focus his/her energies on achieving those goals (Csikszentmihalyi, 1990). In the Wrigley and Emmerson (2013) quantitative study, clear goals was the highest scoring among the flow dimensions. The relatively strong presence of clear goals in the present study would appear to provide affirmation of its importance and the researchers in that study suggested that it could be an important enabler of flow experiences in the music classroom.

9.2.4 UNAMBIGUOUS FEEDBACK

From the quantitative data, the secondary school cohort's experience of unambiguous feedback would appear to be more prominent (score 3.54, rank 5th) than that for the primary school cohort (score 3.46, rank 8th). It was noteworthy that this was the only dimension in which the flow score for the secondary school cohort was higher than the primary school cohort, though the extent of the difference was not significant ($p = .4$). This was borne out by the qualitative data, where dicta from both cohorts suggested that both teachers and students were involved in providing feedback for improvement for both cohorts. This was also corroborated in all four video observations, where the observed teacher-centric nature of all the lessons reinforced the notion of teachers constantly providing feedback on students' musical activities. This accounted for the difference of experiences between the cohorts not being significant. What this probably meant was that while unambiguous feedback was not something that figured prominently in the primary school students' overall flow experiences, it did not necessarily mean that it was not important or significant, given that the scores of 3.54 and 3.46 were both still high. However, the relatively lower dimension scores for both cohorts suggested that this was an area that needed attention, given its importance in helping facilitate flow experiences (Custodero, 2002; Wrigley & Emmerson, 2013).

9.2.5 CONCENTRATION

Concentration featured fairly lowly in the flow experiences for both cohorts, ranking 6th (3.62) and 8th (3.44) for the primary and secondary school students respectively. That there was a significant difference in the cohorts' t-scores would suggest that the primary school students' level of concentration was much higher

than that for the secondary school students. This was reflected in the primary school students' dicta, in which they expressed their frustration when their peers disrupted their music lessons.

For the secondary school students, there were fewer expressions of concentration in their focus group dicta, though their experiences of concentration were more contextual, e.g., they concentrated more during music compared to other academic classes. This difference in level of concentration could be discerned in the video observations. In both primary school lessons, the students were observed to be fully focused and participating in the lesson activities, paying attention to the teacher. In comparison, the secondary school students of SS2 looked generally distracted, and their participation in the singing.

This disparity in the importance of concentration between the cohorts would appear to provide support for the idea that reduced interest in musical learning among older students (Lowe, 2011) in the music classroom and consistent with the general idea of declining motivation to learn music (see e.g. Leung & McPherson, 2011). As concentration had also been identified by Shernoff et al. (2003) as one of the key characteristics of flow in the classroom, this could mean that less flow took place in the secondary school music classroom, evidenced by their lower overall flow scores.

9.2.6 Action-awareness merging

Action-awareness merging was the lowest-ranked dimension for both cohorts' flow experiences, with scores of 3.38 and 3.22 for the primary and secondary school students respectively. While the nature of this dimension is rather abstract in nature, some of the dicta from the focus groups did allude to its presence in students' experiences, particularly when they were engaged in musical activities. While it was not possible to unambiguously 'observe' action-awareness merging taking place, some manifestations of it could be discerned in the PS2 lesson. When the students were successfully engaged in their multi-tasking activity of throwing and catching the ball while singing, this was consistent with Csikszentmihalyi's description of the state of action-awareness merging, in which the participant's attention was so focused that his/her actions became spontaneous and automatic, experiencing a sense of becoming 'one' with his or her actions (Csikszentmihalyi, 1990). Its relative lack of prominence among the flow dimensions could be understood in the context of the start-stop nature of classroom music lessons, where lesson time and activities were

usually short, which lessened the possibility of students getting 'absorbed' in the activities.

The weakness of action-awareness merging could in itself also be a further indicator of students' weak flow experiences in the Singaporean music classroom, given that it had been identified as its key embodying dimension (Csikszentmihalyi, 1975; Quinn, 2005). This finding also alluded to the study of top Singaporean student musicians at the School of the Arts, where action-awareness merging was inexplicably not mapped to their flow experiences (Garces-Bacsal et al., 2011). The combination of weak flow and strong enjoyment as the defining characteristics of students' experiences would appear to bear similarity to 'microflow' as articulated by Csikszentmihalyi (1975, 1992), i.e. students experienced short bursts of flow, or the 'enjoyment' model of flow identified by Wright et al. (2007).

9.2.7 Loss of self-consciousness

The dimension of loss of self-consciousness was ranked relatively lowly at 7th in terms of prominence in both cohorts' flow experiences but with scores of 3.53 and 3.44 respectively, as with the case for unambiguous feedback, the scores per se were still noted to be high and the experiences important. Some manifestations were revealed through the students' dicta:

> "I feel very relaxed and happy because when I listen to music it's like, I don't care about anything else..." [PS3]
>
> "Yah and just anyhow playing. It's like, different." [SS1]

Loss of self-consciousness could be observed in the primary school lessons in the way the students were engaged in their activities: they were willing to try the throwing and handbell activities even though they were not familiar with them and there was little hesitation in their actions when they did. In contrast, this level of engagement was visibly lacking in the secondary school lessons, where students, while participating in the activities, were not observed to be as engaged.

9.2.8 Sense of control

Sense of control was similarly ranked at 4th in terms of prominence for both cohorts, with scores of 3.67 and 3.55 for the primary and secondary cohorts respectively. The nature of this dimension reflected the participant's competency relative to the challenge of the activity so the high scores and ranking suggested that the students generally found the music lesson activities manageable. This

manifested in the focus group data in terms of how students articulated the process through which they acquired the competency (control) needed for the activities. Sense of control was observed in the primary school music lessons when the students were able continue with the activities even when they made mistakes. E.g., for the PS2 lesson, the students were able to continue throwing the ball until they finished the song even though they sometimes threw it at the 'wrong' time, and the PS1 students were able to complete playing the melody on the handbells even though they did not always come in at the right time. Sense of control was not clearly observed in the secondary school lessons but given that the activities were not of great complexity (singing and listening lesson and lecture), the students would not have felt challenged and therefore found the activities manageable.

The nature of sense of control experienced by both cohorts would also appear not to reflect student autonomy in the decision-making processes in their activities (Valenzuela et al., 2018). This was particularly evidenced by the observation data, where the teachers were seen to dominate the classroom proceedings, giving detailed instructions and feedback and most aspects of the musical activities already pre-determined, leaving the students only to carry them out.

9.2.9 TIME TRANSFORMATION

Time transformation was ranked as the 2nd most prominent flow dimension for both cohorts, with scores of 3.92 and 3.77 for the primary and secondary school students respectively. Its high prominence suggested the students keenly felt that time during music lesson did (usually) pass quicker than they normally perceived. The articulations of time transformation were clear and unambiguous and were linked to students being engrossed in their musical activities to the extent that they lost track of time. In contrast, there were no clear manifestations of time transformation in the video observations of the four music classes in that its manifestations as set out in the flow observation table (Table 3.5) were not observed. What this meant was that time transformation may not be something that was easily observed in an authentic classroom. The prominence of time transformation experienced by the Singaporean students was in contrast to the findings of the Wrigley and Emmerson (2013) study, where it was found to be the weakest dimension. Given that the students' flow experiences had been found to be high in autotelic experience and lower in concentration and very low in action-awareness merging, this appeared to suggest that students' experience of time

transformation could be more closely associated with enjoyment. This would be consistent with students' dicta from the focus groups in which they expressed disappointment when they realised that the lesson was over (Csikszentmihalyi, 1990).

9.2.10 CONCLUSIONS

From the above triangulations, it could be concluded that both the primary and secondary school students experienced some level of flow in the music classroom. While the video observations and factor analysis did not in all instances show up the nine dimensions, the holistic picture painted was unmistakably flow-like, characterised by enjoyment, overcoming of challenges through persistent trying, patient teacher guidance and focus on the task at hand. Wright et al. (2007) had raised the possibility that there could be different nuances of flow involving the interplay of different dimensions, making the exploration of the students' experiences the next logical step.

9.3 QUESTION 2:

If flow was present, what was the nature of the students' flow experiences?

The following sections discuss the students' flow experiences by cohort in terms of the flow dimensions by firstly bringing together and triangulating the findings from the different data sources and then discussing the overall experience.

9.3.1 PRIMARY SCHOOL STUDENT EXPERIENCES

The primary school students' flow experiences were strongly characterised by enjoyment or autotelic experience. This was evidenced by its high mean score of 4.05, the only dimension with a mean score of >4, making it the most prominent flow dimension for the primary school students. This was strongly corroborated by the other data findings: in the factor analysis of the primary school cohort, autotelic experience was loaded in Primary School Factor 1 (PF1, the first-ranked factor in the analysis), enjoyment was a theme that came out very strongly in focus groups and was also constantly observed in both the primary school video recordings – student laughter was a constant feature of both lessons.

Time transformation was the next most prominent dimension with a score of 3.92. Its importance was also corroborated in the factor analysis, where time transformation shared loading in PF1 with autotelic experience. Though it was not

clearly manifested in the video observations, its presence in the primary school classroom was clearly articulated in the focus group data, in which the students mostly remarked that they felt time passed quicker during music lessons.

Clear goals was the next most prominent flow precedent dimension with a score of 3.71. This quantitative finding was supported in the factor analysis, in which clear goals was found to be prominently loaded onto three factors PF2, PF3 and PF4, a seeming testament to its ubiquity in the primary school music classroom. From the qualitative data, there were also many references in the focus group dicta of teachers constantly reminding students of activity objectives. Teachers were also noted to be explaining lesson objectives to students in the video observations, especially for PS2 which had a more complicated activity.

With a mean score of 3.67, sense of control would appear to be the next most important dimension. However, this was not clearly supported by the factor analysis, in which sense of control was the only factor not to have loaded onto the seven factors extracted for the primary school cohort. There were limited references to its presence in the focus group data, mainly confined to students expressing greater confidence in performing musical tasks after practice and receiving guidance from teachers. It was somewhat more clearly manifested in the video observations in the context of the students being able to successfully accomplish moderately challenging activities involving teamwork after a few rounds of practice.

The next prominent dimension was challenge-skill balance with a mean score of 3.65. It loaded onto two factors PF2 and PF4, which would appear to accord it more importance relative to its quantitative ‘ranking’ as the dimension fifth in importance. In terms of the focus group dicta, the students alluded to the teachers giving due consideration to the level of difficulty of the activities relative to the skill level of the students. From the video observations, it did not appear that the activities carried out in PS1 and PS2 were of a high level of difficulty – for PS1 it was singing and handbell activities and for PS2 it was a rhythm singing and ball-throwing activity. The teachers had therefore considered the ability of the students in designing the activities.

Concentration had a score of 3.62 and was the sixth-most prominent dimension. Its relatively lower level of importance was reflected in its loading in the last two factors PF6 and PF7 in the factor analysis. The quantitative findings did appear to be somewhat at odds with the qualitative findings. Concentration was a theme that was strongly reflected in the focus group dicta, particularly in connection

with students' enjoyment of the musical activities. This was also supported by the video observations, in which the students were often observed quietly listening to their teacher and looking focused when doing the activities.

The seventh-ranked dimension was loss of self-consciousness, with a mean score of 3.53. Factor analysis revealed this dimension as loaded onto PF5, which supported its relatively 'lower' prominence. While there were some references to loss of self-consciousness in the focus group dicta, these did not come across as strong manifestations. This could have been due the classroom activities generally being of short duration of a few minutes and the stop-start nature of the music classes, as observed in the video observations.

Unambiguous feedback was the eighth most prominent flow dimension with a score of 3.46, the first dimension to score below 3.5. Its lack of prominence in the quantitative analysis was somewhat at odds with the factor analysis, loading onto PF2 and PF3. Both strands of the qualitative analysis lent further credence to the theory of a higher degree of prominence for unambiguous feedback. The students made clear mentions of the feedback they received from their teachers in the focus group dicta. Constant streams of comments provided by the teachers was also something that was strongly observed in the video observations.

The least prominent dimension based on the mean score was action-awareness merging with a score of 3.38, which was somewhat supported by factor analysis, where it was loaded onto PF5. It was referenced in the focus group dicta by students when they described the process they went through when successfully attempting to do musical activities they found challenging but not pervasively. There were also some manifestations in the video observations when students similarly tried to do challenging activities which required teamwork.

9.3.1.1 Discussion of overall flow experience

In this discussion, I will adopt the approach used by Wright et al. (2007) to understand the students' experience of flow by focusing on the relative 'presence' (or absence) of the nine dimensions. In that study, the researchers, having found (or presumed) the presence of flow in their research participants' occupational activities, examined the nature of their experiences and compared it with flow's nine-dimension model and discerned four different nuances of the flow experience defined by differing combinations of prominent flow dimensions. In its wider objective to investigate the nature of flow experiences in terms of its dimensions, there were thus

similarities with this study and its approach could therefore serve as a useful reference here.

Based on the triangulation of the quantitative and qualitative data findings, it seemed clear that the primary school students did experience flow in their school music lessons to some extent. Firstly, the mean scores for all nine flow dimensions were all quite high, comparable to those found in Wrigley and Emmerson (2013), where the range of flow scores by dimension was from 3.12 to 4.12. Secondly, the qualitative data reflected the presence of all the nine flow dimensions, though some appeared weaker than others, namely action-awareness merging and loss of self-consciousness. Based on the flow observation table (Table 3.5), the nine dimensions were also observed in the video observations. In the factor analysis, eight of the nine dimensions were loaded onto the seven factors for the primary school cohort, with sense of control not mapped.

The dominant perception of the primary school students' experiences was one of happiness and enjoyment, the key outcome of flow which strongly reflected the dimension of autotelic experience. It was clear that they very much enjoyed their music lessons, also reflected through their constant references about how much they liked music, especially in comparison to their attitude towards 'academic' subjects, consistent with extant literature which found music more enjoyable than other academic subjects (Csikszentmihalyi et al., 1993). This was reinforced by the positive body language and copious amounts of laughter noted from the video observations, as well as the enthusiasm with which they recounted their experiences during the focus groups. There was also a palpable sense of togetherness in the classroom where students worked together to accomplish their musical tasks. The students were focused and concentrated in their musical activities and as they tried out and worked on their tasks, were sometimes not concerned about how they may have appeared to their classmates. This was especially so in the PS2 observation, where some of the students' attempts to catch the ball resulted in comical moments that caused much laughter. After some practice, they became more confident in what they were doing and were able to accomplish the musical tasks given to them. In the process just described, the flow process dimensions of concentration, sense of control, loss of self-consciousness and action-awareness merging were manifested. The students could be said to be engaged in the manner described by Shernoff and colleagues (Shernoff & Csikszentmihalyi, 2009; Shernoff et al., 2003) based on the presence of concentration, interest and enjoyment.

Throughout the lesson, critical to the experiences were the inputs of the teachers. They were constantly engaged with the students, explaining the activities, setting out the activity processes and objectives and giving guidance during or after the activities as needed. The flow precedent dimensions of challenge-skill balance, clear goals and unambiguous feedback were manifested. For challenge-skill balance, the video observations of PS1 and PS2 showed activities that were initially a little more challenging in that students were not familiar with them. The strong teacher influence in the classroom was reflective of the first of Custodero's three proposed approaches to facilitating flow in the classroom (Custodero, 2002). On the other hand, this also meant that Custodero's second approach of allowing for student autonomy was weaker as students were often following teachers' instructions and given little room to make musical decisions in the activities. In engendering the positive classroom atmosphere by being supportive and planning appropriately challenging activities for the students, the music teachers had facilitated flow in the classroom in the manner envisioned by Byrne and Sheridan (2000). However, while both the students' quantitative and focus group data clearly pointed to the presence of flow, the video observations cast a different light, suggesting that the students' flow experiences were probably more episodic in nature. This would be more akin to the 'microflow' referred to by Csikszentmihalyi (1992) in that the experiences may not be particularly deep, given that the musical activities were generally short in duration. This would also be consistent with weaker manifestations of the key flow experience dimension of action-awareness merging (Csikszentmihalyi, 1975; Quinn, 2005), given that the short musical activities were not always conducive to bringing about the absorption and spontaneity central to this dimension (Csikszentmihalyi, 1990).

9.3.2 Secondary school student experiences

The secondary school students' flow experiences also showed strong manifestations of autotelic experience, with a mean score of 3.94. This was corroborated in the factor analysis where it also loaded into the first factor SF1. The sense that the students enjoyed their music lessons was also conveyed in the student's focus groups and the dicta suggested that there it was largely intrinsically driven by the students' inherent interest in music. The video observations were less conclusive, with enjoyment in SS3 being observed as the students' superficial reaction to the instructor's jokes, and sporadically observed in SS2.

Time transformation was the next most prominent, with a mean score of 3.77, reflected in the factor analysis in which, like the primary school cohort, it was also strongly loaded into SS1. In their dicta, the secondary school students mentioned that they experienced time transformation, usually in the form of time passing quicker but also in their frustrations at not being able to start music classes on time and maximise their short time allotted for music classes. There was a sense of their experiences of time transformation being due to their being engrossed in their musical activities, which suggested a link with enjoyment or autotelic experience.

The third most prominent dimension for the secondary school students was clear goals, with a mean score of 3.66. In the factor analysis, it loaded highly into SF2, and was also prominent in SF5 and SF6, which supported the idea that clear goals was something pervasive in the secondary school students' flow experiences. There was some mention of clear goals in the focus groups, mainly in the context of the students having clarity of what to do for the activities due to the teachers' explanations. It was more clearly observed in SS2, where the teachers introduced and explained each activity before carrying them out.

With a mean score of 3.55, sense of control was the next most prominent dimension and its prominence was affirmed in the factor analysis, in which it loaded onto SF3. This dimension was also not clearly articulated in the focus group dicta, as its concept of being in control while feeling challenged was not something that could be easily understood by the students. What emerged from the dicta that approximated this was a sense of the students slowly gaining confidence as they tried out or practised the activity before eventually being able to accomplish it to some level of competency. This was something that was observed in the SS2 video observation as the students were doing the short clapping activity, which some eventually managed to accomplish after a few rounds of practice.

Fifth in prominence was unambiguous feedback with a mean score of 3.54, loading onto SF2 and SF5 in the factor analysis. Its importance in the students' experience was clearly supported in the qualitative data, with the teacher's inputs mentioned by the students as a key feature of the classroom. It was even articulated in one instance that the teacher's eagerness and constant interventions during the activities somewhat diminished their challenge. Despite the highly teacher-centric nature of the secondary school music classes, instances of unambiguous feedback were few in the video observations, with the teachers mainly focused on delivering content in a lecture-style.

Next in prominence was the dimension of challenge-skill balance with a score of 3.52, which loaded onto SF2 along with the other flow precedent dimensions in the factor analysis. From the qualitative data, there seemed to be an imbalance in the challenge of the activities compared to the ability of the students, with students generally saying that they found many activities not challenging. This was also observed in the video observations, where the lessons were mainly carried out in a lecture style, with few student activities.

Loss of self-consciousness was the seventh-ranked dimension for the secondary school students, loading onto SF4 together with action-awareness merging. Some indirect references to loss of self-consciousness could be found in the qualitative data mainly in the context of students having to perform before their peers in class, suggesting that there were moments when the students appear to have lost their concern for how others might have viewed them as they performed. At the same time, there was also dicta to suggest that the students were still conscious of making mistakes and appearing to look bad before their friends as they performed. Loss of consciousness was not observed during the video observations.

With a score of 3.44, concentration was the eighth-ranked dimension, loading onto SF3 and SF6 in the factor analysis, suggesting a degree of pervasiveness in the secondary school students' flow experiences in spite of its relatively lower prominence. From the qualitative data, the students' concentration would appear to have stemmed from being engrossed in the musical activities, with some expression of frustration when their enjoyment of the lesson was disrupted by 'troublemakers'. They also hinted that their level of concentration was higher for music lesson than for other academic subjects due to their greater interest in music. The presence of concentration was also clear in the video observations, with the students in SS3 observed to be quietly paying attention to the instructor while the students in SS2 were most focused when watching the videos or teachers' musical demonstrations.

The dimension that was the least prominent for the secondary school students was action-awareness merging, with a mean score of 3.22, loading onto SF4 together with loss of self-consciousness. As action-awareness merging usually required the participant to be engaged in longer activities, its lack of prominence in the secondary school students' experience could be attributed to the short lesson duration and the generally stop-start nature of the music lessons which often comprise short activities that were therefore not conducive to its propagation. The students' dicta only hinted at its presence while the video observations also did

reveal anything clear-cut, though the students in SS2 did perhaps manifest some elements when some of them, after some practice, were able to carry out the clapping activity to some degree.

9.3.2.1 Discussion of overall flow experience

From the triangulation of the data from the secondary school cohort, it also seemed clear that they experienced flow. The mean scores for the flow dimensions, while generally lower than those for the primary school students, were still relatively high, scoring >3 for all. In the focus group data, most of the dimensions could also be discerned through the students' descriptions of their classroom activities, though their articulations of loss of self-consciousness seemed weaker. There was less clarity from the video observations, with the dimensions of unambiguous feedback, action-awareness merging, loss of self-consciousness and time transformation not observed in both lessons, though the absence of these dimensions did not necessarily preclude the presence of flow (Quinn, 2005). However, all nine dimensions were clearly mapped out in the factor analysis and were loaded onto the first four factors of the six-factor solution, which alluded to their strong presence in the overall experience. Clear goals, while not the most prominent dimension, did appear to be the most pervasive of the dimensions, manifesting in three factors. This can be said to bear some similarity with findings in the study by Beese and Martin (2019) that found 'learning goals', manifested through a desire to complete learning tasks, a key theme of the high school students' flow experiences. This sensitivity to 'goals' in the secondary school cohort could in itself be a reflection of the generally more pragmatic mentality of older students towards task accomplishment in their motivation compared to their younger more joy-seeking counterparts in primary schools (Lowe, 2011).

The most prominent facet of the flow experience for the secondary school students was enjoyment, characterised by deep engagement in the musical activities to the extent that they sometimes lost track of time (SF1 – 'absorbed enjoyment'). From the qualitative data, a qualifier to this would be that certain activities captured their attention more, namely those involving actual music-making such playing musical instruments, group work and activities having some element of challenge that actively involved the students. This was consistent with the findings of (Shernoff et al., 2003) that flow in the classroom was better generated through engaging and challenging activities. The students also said they did not always find the activities

too challenging, which could be the reason they also found music lessons more 'relaxing' and enjoyable compared to other academic subjects. In this sense, there was some similarity with the primary school students and provided further affirmation for the findings of Csikszentmihalyi et al. (1993) that music was inherently more enjoyable than other subjects. Students also appreciated their teachers' efforts in facilitating the lessons (SF2 – 'flow preparation'). The teacher's pervasive presence was clearly affirmed in the video observations, where the teachers in both classes dominated lesson proceedings. More importantly, the students attested to the teachers' decisive role in making music lessons enjoyable through adopting fun teaching approaches and making the classroom environment more relaxed and stress-free. As with the primary school lessons, the strong teacher influence again reflected Custodero's first approach to facilitating flow but also weaker second approach of student autonomy (Custodero, 2002). While the factor analysis put concentration down as an important and pervasive presence in the music lessons (SF3 – 'dominant concentration', SF6 – 'guided enjoyment'), it ranked a lowly eighth in prominence in the mean flow score. This could be due to the activities not being very challenging so the students were able to handle them without difficulty (Quinn, 2005). Though the manifestations of concentration described by the students appeared to be relative, in that they concentrated more during music lessons as they preferred music to other academic subjects. The video observations found that the students were generally quite focused (quiet) during lessons, particularly when watching musical demonstrations, which affirmed SF6, affirming that in music, flow could also be experienced through sensual engagement such as listening (Csikszentmihalyi, 1990; Diaz, 2013).

The students also appeared to be quite engaged when taking part in lesson activities, as evidenced by SF4 – 'unconscious action'. This likely happened when the students gained the skills needed to accomplish the activity over time through practice, which was observed in the video observation for SS2. This would imply that the activity initially posed some challenge to the students that they would have to overcome. The prominence of 'unconscious action' in the students' experience would appear to be inconsistent with the lower rank and mean flow scores of its component dimensions of loss of self-consciousness (seventh) and action-awareness merging (ninth). What this appeared to suggest could be that while 'unconscious action' was something the students felt was a prominent experience, it was not something that occurred frequently due to the low level of challenge students found of their

activities. This suggested that the students' flow experiences were, similar to the primary school cohort, closer to microflow end of the flow continuum (Csikszentmihalyi, 1992) probably due to the brevity of the activities necessitated by the short lesson time (30 minutes). This would also appear to be consistent with the weaker presence of concentration as the shorter and less intense activities observed, such as watching videos and mass singing, would not need the focus associated with stronger macroflow (Csikszentmihalyi, 1990). Working together in a group was also a prominent feature of their experience (SF5 – 'co-operation and communication'). The students had articulated their enjoyment of doing musical activities together with their friends, discussing and sharing their ideas and seeking clarifications from the teacher when needed. This was however not observed in the video observations as both lessons featured highly teacher-centric approaches. The influence of the teacher in the classroom was further highlighted in SF6 – 'guided enjoyment', in which clearly articulated activity objectives enabled the students to comprehend what needed to be done to complete and enjoy the activity. This was also corroborated by the video observations, in which the teachers started the lessons by informing students of what the lesson objectives were, and then checking on the students to keep them on track. The strong teacher influence evidenced in the wider analysis again underlined the important role played by the teacher in facilitating (or not) student flow experiences (Bakkar, 2005; Custodero, 1998; Garces-Bacsal et al., 2011). At the same time, it is worth bearing in mind that over emphasis on teacher-centricity at the expense of student autonomy could have a potentially negative impact on flow (Valenzuela et al., 2018).

9.4 QUESTION 3

Do the flow experiences of primary five and secondary one students differ, and if so how?

Having determined that the students did experience flow, the next question would be to examine and contrast the nature of their flow experiences. From the quantitative findings, the primary school students had a higher overall mean flow score than the secondary school students (3.70 vs 3.59), and also higher mean scores for eight of the nine dimensions, except sense of control. This would suggest that the primary school students had comparatively stronger experiences of flow and would be consistent with research concluding that younger children generally

experienced more enjoyment during music lessons (Lowe, 2011) and were also more in touch with flow than older ones (Custodero, 2005).

A comparison of the factor analysis findings showed that the primary and secondary school students shared four common factors:

- PF1 and SF1 – 'absorbed enjoyment' (autotelic experience and time transformation)
- PF2 and SF2 – 'flow preparation' (challenge-skill balance, clear goals and unambiguous feedback)
- PF3 and SF5 – 'co-operation and communication' (clear goals and unambiguous feedback)
- PF5 and SF3 – 'unconscious action' (action-awareness merging and loss of self-consciousness)

In addition, PF6 ('weak concentration), PF7 ('diffused concentration) and SF3 ('dominant concentration') shared a common characteristic in essentially being manifestations of the dimension of concentration. 'Absorbed enjoyment' and 'flow preparation' shared similar factor rankings, meaning that these factors and their inherent flow qualities could be said to have co-equal prominence in the students' experiences. The preceding would appear to suggest that the primary and secondary school students did share considerable similarities in how they experienced flow. This was corroborated by the quantitative data in two ways. Firstly, the mean flow scores from the quantitative data showed that the two cohorts shared the same ranking for six of the flow dimensions – autotelic experience (first), time transformation (second), clear goals (third), sense of control (fourth), loss of self-consciousness (seventh) and action-awareness merging (ninth). Secondly, while the primary school students had higher mean scores for eight of nine dimensions, the difference between the cohort scores was only statistically significant in one of the dimensions.

The prominence of the three flow precedent dimensions loaded onto two common factors 'flow preparation' and 'co-operation and communication' further affirmed the strong influence of teachers in the students' flow experiences (Custodero, 1998; Garces-Bacsal et al., 2011; Rusinek, 2008). Coupled with the weak loading of sense of control in both cohorts, this teacher prominence was accompanied by weak student autonomy, which however did not appear to impact students' enjoyment of music lessons. This, together with the strong element of autotelic experience in both cohorts clearly evidenced in all the data sources

reinforced the idea that music was inherently enjoyable (Csikszentmihalyi, 1990; Csikszentmihalyi et al., 1993). That time transformation was loaded with autotelic experience in the factor 'absorbed enjoyment' alluded to the idea that when the students found activities enjoyable, their experience of time also deviated from the normal. That both cohorts shared the factor 'unconscious action' evidenced some level of student engagement in the musical activities.

A clear difference between flow experiences of the two student cohorts was in the way they experienced concentration. From the factor analysis, it would appear that the secondary school students overall had stronger experiences of concentration during their music lessons, as evidenced in the strong factor loadings of concentration in a single factor 'dominant concentration'. This was in contrast with the two relatively weaker manifestations of concentration that were experienced by the primary school students, appearing to suggest that the primary school students generally could have lower levels of concentration. This, however, appeared to be contradicted by the quantitative data, where the primary school students not only had a higher mean score for concentration (3.62 vs 3.44), but the difference between the scores of the two cohorts was statistically significant. What this might suggest could be that while the secondary school students had longer attention spans and experienced concentration more consistently throughout the music lesson, the primary school students' concentration was more episodic in nature, more focused when doing the musical activities but perhaps more distracted in between activities, accounting for the more 'diffused' nature of their experience of concentration. The presence of concentration in the classroom has been found by Shernoff and Csikszentmihalyi (2009) as indicative of meaningful learning but could also be a function of the activities students were engaged in.

Sense of control was the one flow dimension for which the secondary school students enjoyed a higher mean score (3.67 vs 3.55) compared to the primary school students, though the difference was not statistically significant. This suggested that the secondary school students, perhaps due to their greater accumulated knowledge of music and experience in musical activities were generally more confident and certain when it came to carrying out the musical tasks. Another possibility could be that older students were accorded a higher degree of autonomy and control when carrying out musical activities (Valenzuela et al., 2018). This was somewhat corroborated in the factor analysis which showed that sense of control did

not map into any of the seven primary school factors, while it did map onto SF3, albeit only for one variable and therefore not particularly strongly.

9.5 QUESTION 4

Do the flow experiences differ between students with and without additional musical learning experiences either within or outside the school context?

The students with prior music experience had a higher overall mean flow score than their counterparts without music experience (3.72 vs 3.63), and also had higher mean scores in eight of the nine dimensions, except loss of self-consciousness (3.54 vs 3.48). Out of the eight dimensions, only the mean score difference for the dimension of challenge-skill balance was statistically significant at the 95% confidence interval, though it was also noted that the difference between the mean scores for clear goals was very close to being statistically significant (.07). Four of the dimensions also shared the same level of prominence based on their mean score rank: autotelic experience – first, time transformation – second, clear goals – third, and loss of self-consciousness – ninth. These findings echoed those made by Sinnamon et al. (2012) in their comparative study of the flow experiences of 'professional' (additional music experience in the context of this research) and 'amateur' (no music experience) level musicians in a number of ways. Firstly, both the 'amateur' and 'professional' musicians experienced flow; secondly, the 'amateur' musicians had a stronger experience of loss of self-consciousness; thirdly, the 'professional' musicians had more pronounced experiences of challenge-skill balance and clear goals. The low prominence of action-awareness merging would also appear to be consistent with its lack of presence in the flow experiences of high-performing arts students in a Singapore arts school reported by Garces-Bacsal et al. (2011).

For the factor analysis, the students with and without additional music experience both had five factors, of which three were common:

- CNF2 and CMF3 – 'planning' (challenge-skill balance and clear goals);
- CNF5 and CMF4 – 'co-operation and communication' (clear goals and unambiguous feedback);
- CNF4 and CMF5 – 'absorbed enjoyment' (loss of self-consciousness and action-awareness merging).

In addition, another factor could also be said to share strong similarities: CNF1 'calibrated absorbed enjoyment' was an evolved version of CMF1 'absorbed

enjoyment', the dimensions of autotelic experience and time transformation having the additional influence of concentration. The strong sense of enjoyment experienced by both groups provided support for the notion that flow could be enjoyed at all levels of expertise (Csikszentmihalyi, 1990; Sinnamon et al., 2012). The prominence of all three flow precedent dimensions further alluded to the pervasiveness of teacher influence in the classroom (Custodero, 1998; Rusinek, 2008). The factor analysis findings therefore provided additional support to the idea that the flow experiences of students with and without music experience were quite similar. The was further corroborated by the focus group qualitative findings, with both the students with and without music experience largely similar in articulating their experiences of flow, covering the nine dimensions in the process.

The key difference between the flow experiences of the two cohorts of students would be that the dimension of sense of control did not load onto any of the factors for the students without music experience, while it was loaded onto 'focused confidence' for the students with music experience. This might not appear consistent with the quantitative finding that sense of control was ranked fourth in prominence based on the mean flow score for the students without music experience, compared with fifth for students with music experience. The students with music experience would presumably be stronger musicians and had additional musical knowledge, explaining why they felt a greater sense of control in their musical experiences (Csikszentmihalyi, 1990). However the overall weakness of sense of control reflected in all the data sources further demonstrated that autonomy was not a prominent feature in the flow experiences of the students (Valenzuela et al., 2018), which was consistent with the pervasive teacher presence denoted by the strength of the flow precedent dimensions. Based on the idea that concentration was an indicator of learning (Shernoff & Csikszentmihalyi, 2009), the prominence of concentration for the students without music experiences suggested that they may have found musical learning in the classroom more meaningful than the students with music experiences. This was perhaps also reflective of the fact that while the latter group did enjoy the musical activities, they may not have found as much to learn in the classroom as they had stronger musical competencies and skillsets to carry out the musical activities. While this was not consistent with the finding by Csikszentmihalyi et al. (1993) that talented (higher ability) students concentrated more, that study was done in the context of those students in a more challenging learning environment

tailored to their strengths as opposed to this study, in which they are placed in mixed ability classes with learning designed to cater to all students.

9.6 QUESTION 5

How do the music teachers impact the students' flow experiences?

The potential for the teacher to leverage on flow to enhance student learning has been mooted by education researchers (Bakkar, 2005; Byrne et al., 2003; Byrne & Sheridan, 2000; Shernoff & Csikszentmihalyi, 2009). Among the flow dimensions, the flow precedents of challenge-skill balance, clear goals and unambiguous feedback provide leverage points for teachers to facilitate flow (Custodero, 1998; Diaz, 2013; Wrigley & Emmerson, 2013) in order to capitalise on the enjoyability of music and its intrinsically rewarding nature (Csikszentmihalyi & Schiefele, 1992). Ultimately, through flow, music teachers can help students realise their potential and bring about self-growth and self-knowledge (Elliott & Silverman, 2015), and cultivate long term interest in music.

From the quantitative data, the order of prominence of the flow precedent dimensions was as follows: clear goals – third, challenge-skill balance – fifth, and unambiguous feedback – eighth. From this, it could be inferred that the teacher's influence was most felt by the students through their planning of the musical activities, viz setting them at the appropriate level of difficulty and communicating the lesson objectives clearly (Wrigley & Emmerson, 2013); less influential, it seemed, was the feedback provided to help the students complete the activity. The importance of the flow precedent dimensions could be seen in the factor analysis in which all three loaded onto CF2 'controlled flow preparation'. The particular prominence of clear goals was also corroborated, with the dimension being loaded into three of the factors, including one factor in which clear goals was the only loaded dimension, which would attest to its pervasiveness in the students' experiences and their perceived clarity of the activity goals. Also pervasive was unambiguous feedback, which also loaded onto another factor with clear goals – 'co-operation and communication'. The importance and pervasiveness of unambiguous feedback did not appear consistent with its lack of prominence in the quantitative data, especially when compared to challenge-skill balance. There were two possibilities to explain this: firstly, the feedback was not always clear; secondly, the activity goals were not sufficiently challenging (Csikszentmihalyi, 1990). From the observation data, the musical activities did appear to be of low challenge, such as mass singing, listening

to lectures and watching videos. Coupled with the observed evidence of teachers constantly advising students on how to make improvements, this would explain the pervasiveness but yet lack of prominence of unambiguous feedback in the students' flow experiences.

The factor analysis also provided some insight into the manner in which the teachers influenced students' flow experiences. CF2 'flow preparation' firstly alluded to the importance of teacher preparation for the lesson and provision of feedback during and after the activity. CF3 'co-operation and communication' suggested that there were group musical activities in which students needed to work with one another to discuss their approach to accomplishing the activity. CF6 'focused clear goals' provided additional indication of the students' perception that they had been provided with clear goals by the teacher for the classroom activities.

These characteristics of teacher input were consistent with the qualitative data. From the focus groups, the students strongly affirmed the importance of teacher inputs in facilitating flow through observable actions such as providing feedback to guide students through the activities and constantly reminding them of the goals of the activities, and especially in making the lessons enjoyable (Bakkar, 2005; Custodero, 1998). The students indicated they experienced a sense of togetherness and enjoyment through working with their peers. However, the students, including those without prior music experience, did not appear to think that the activities were particularly challenging for them; some were quite forthright in saying that they found the activities easy. The video observations also revealed the highly teacher-centric nature of the music classroom in Singapore, with the teachers involved in running every aspect of the lessons. Amongst others, the teachers were observed providing instructions, leading musical activities, facilitating discussions on the activities, disciplining students, doing activity demonstrations and role modelling. The types of musical activities the students were observed participating in did not appear to be particularly challenging: there were mainly mass singing activities, instrumental-learning sessions and simple ensemble performances, providing a flavour of the activities students went through during regular music classes. This once again underlined the decisive role played by the teacher in influencing learning in the music classroom (Dillon, 2007). Through all this though, the students were observed to be mostly enjoying the music lessons. It would therefore appear that students enjoyed music lessons even in the absence of challenge-skill balance,

which would appear to affirm the self-rewarding or autotelic nature of musical activities (Csikszentmihalyi & Schiefele, 1992).

9.7 LIMITATIONS OF RESEARCH

This research sought to understand the flow phenomenon in the music classroom in Singapore schools from the lens of the students themselves, hence the use of self-reporting questionnaires and focus groups as the key data collection approaches. As with self-reported data sources, the general issue was whether students' responses reflected what they truly felt. Indeed, in Singapore as with many other East Asian countries in which the Confucian precept of deference for authority was prevalent, there was the possibility that students were merely providing responses they thought the present authority (the researcher) was 'expecting'. In the focus groups, there was also the risk of 'group think', of students merely echoing what their friends had said as they may not be comfortable expressing their views or of a few students dominating the conversation (Kreuger & Casey, 2015).

I had sought to mitigate these limitations in a number of ways. Firstly, by adopting a mixed method approach and data triangulation, I had hoped that studying students' flow experiences from multiple angles would provide a more comprehensive picture of flow in the music classroom. Secondly, at the data collection stage, I gave clear instructions to the students that there was no right or wrong answer, assured them that their responses would remain confidential and that providing honest responses would be most helpful for the research. I had also not requested for the teachers' presence at the focus groups to further encourage students to speak their minds, though I did not turn down any request to be present (Cohen et al., 2011). Thirdly, as both the quantitative questionnaire and focus groups were both self-reporting, I intentionally included video observations as an additional data source to inject some degree of objectivity to the eventual data triangulation by observing the conducting of music classes first-hand. In order to ensure objectivity and eliminate researcher bias (Creswell, 2009), I had devised a flow observation table (Table 3.5) that set out the observable characteristics of each flow dimension as an aide. On the issue of focus groups, I sought to avert group think by asking probing questions where necessary to ensure that the students' responses were backed up by details of actual musical experiences, and also made the effort to ensure that every student present had the opportunity to speak by going around the table for each question (Carey, 2015).

Other limitations related to the manageability of the data. Due to the choice of mixed methods as the research methodology, I decided that only three primary and three secondary schools would make up the sample to ensure the many sources of data coming from each school could be manageable by one person. As such, the final quantitative sample obtained was not particularly large (310 for the primary schools and 100 for the secondary schools). However this was to some extent compensated for by having the focus groups and video observations.

For the qualitative data, the attendance for some of the focus groups was also not full, I sought to maximise the time I had with the students present by asking more probing questions and giving them more time to speak to ensure there was not a lack of diversity and range of experiences in the feedback obtained from the students (Kreuger & Casey, 2015). Another limitation pertained to the video observations. While there were only four video observations, my decision not to request to observe lessons with activities that could have had stronger potential for flow but giving discretion to the teacher to select the music lesson ensured the authenticity of the observation date collected and reduced the possibility of the video observations turning into fishing expeditions for flow-like experiences (Braun & Clarke, 2006),

As this research focused on students' flow experiences from their perspective, it did not explore how the teachers actually impacted the flow experiences, e.g., lesson planning, learning content, intentional facilitative processes and possible teacher flow contamination (Bakkar, 2005). Instead, the study sought to affirm the teachers' role in bringing flow to the music classroom, which was largely confirmed by the findings of both the focus groups and video observations, corroborating extant research on the importance of teachers in bringing about flow for students (Garces-Bacsal et al., 2011; Rusinek, 2008).

9.8 IMPLICATIONS

This research confirmed the presence of flow in the Singaporean primary and secondary school music classrooms, which further attested to Csikszentmihalyi's assertion that flow was a phenomenon that transcended cultural boundaries and was something that could be enjoyed by all (Csikszentmihalyi, 1975, 1990). The flow experiences were strongly characterised by autotelic experience or enjoyment and consistently experienced by the students across the different groupings that were studied and compared in this research, namely primary and secondary school students and students with and without music experience. This was despite the fact

that students were quite clear in indicating that they did not generally find the musical activities in class particularly challenging, i.e. lack of challenge-skill balance. However, as Wright et al. (2007) had demonstrated that there could be differing manifestations of flow and the students' experiences arguably fell into what the researchers termed 'enjoyment', a flow state which, due to the challenges being lower than the students' skill level, lacked anxiety or the kind of tension that could keep students on their toes but would still bring them satisfaction when they completed the activity. This was consistent with dicta from the students that they found music lessons 'relaxing', especially compared to more stressful academic lessons, and some openly admitted that their primary purpose in music classes was to relax. This lack of challenge in the musical activities could pose a potential issue as there were abundant studies that have concluded that it was the key ingredient in flow that impacted musical learning (Custodero, 2002, 2005; Dillon, 2007; Shernoff et al., 2003).

There was also support for the notion that flow was an experience that could be facilitated by the teacher in the classroom through the flow precedent dimensions of challenge-skill balance, clear goals and unambiguous feedback. Teacher intervention has often been mentioned as a key lever for flow in the music classroom (Custodero, 1998, 2002; Dillon, 2007; Wrigley & Emmerson, 2013). From the discussion, the highly teacher-centric music classroom environment in Singapore ensures that the music teacher plays a pivotal role in influencing flow through the careful planning of musical activities (Byrne & Sheridan, 2000; Wrigley & Emmerson, 2013). There was therefore the potential for music educators in Singapore to leverage on flow to enhance student learning experiences to encourage students to develop a lifelong interest and engagement in music. However based on the research findings, the music lessons would appear to currently lack an important element needed to realise the potential of flow in music as a means to achieving human flourishing through self-growth, self-knowledge and enjoyment (Elliott & Silverman, 2015): adequately challenging activities currently carried out in class. Without an adequate element of challenge in the activities, students would likely feel apathetic towards seeking further challenge and as such, be less able to realise their potential as human beings through the increased complexity of the consciousness that could have been brought about by overcoming increasingly difficult musical challenges (Elliott & Silverman, 2015).

However, this teacher-centricity came at the expense of student autonomy, a sense that students felt ownership over the music-making and learning processes, which was another key enabler of flow (Kowal & Fortier, 1999; Rusinek, 2008; Valenzuela et al., 2018). This weakness of the dimension of sense of control in the students' flow experiences provide an additional lever with which teachers could use to facilitate flow. This could be accomplished by giving students some say in the types of musical activities they would like to do, the music they would like to learn (Byrne & Sheridan, 2000), designing activities that encouraged student engagement and involvement in the learning process and group music composition activities (MacDonald et al., 2006). In addition, the degree of self-autonomy exercised by students also has an impact on the quality of motivation, including longer term motivation (Ryan & Deci, 2000b). Hence enhancing the dimension of students' sense of control in the music classroom could also have a positive impact on cultivating longer term interest and intrinsic motivation in students to continue in musical activities.

The focus groups and video observations provided examples of the musical activities in the classroom the students said that they did not always find challenging, e.g., mass singing, watching videos and listening activities. However, there was also mention of certain activities that students found more challenging, such as learning to play a musical instrument and activities involving group work. While certain activities may be conducive to flow, the key issue was that the level of challenge needed to be more calibrated in order for students to expend the psychic energy needed for meaningful learning and growth (Csikszentmihalyi, 1990; Elliott & Silverman, 2015). For instance, the video viewing and listening activities observed in the classroom were used as musical demonstrations, which did not require much processing of information so they could have been made more challenging by getting students analyse or critique the musical elements (Diaz, 2013).

In summary, music teachers in Singapore could enhance learning for students through flow by providing more challenging musical activities and allowing for greater student autonomy in the classroom. Without some element of challenge or rigour, such activities are more likely to lead to 'pleasure' rather than 'enjoyment' as distinguished by Csikszentmihalyi (1990), which would not lead to growth and learning.

Based on the above considerations, the following are the proposed recommendations for the consideration of curriculum planners in Singapore:

(a) Additional research needs to be conducted on how teachers can directly influence the bringing about of flow in the music classroom, e.g., pedagogies, learning activities, facilitation techniques etc.

(b) Once the preceding has been ascertained, training could be conducted to inform teachers of the potentials of flow in music education so that teachers can better understand the nature of flow consider how to best realise it in their teaching.

The following are proposed recommendations for the consideration of music teachers in Singapore:

(a) When planning musical activities, be intentional in customising the level of challenge based on the students' level of musical competence. The musical activities used for the different levels may be the same, but pitched at the appropriate level of difficulty, e.g., in an instrumental learning activity, more skillful students could be given more challenging pieces to play, or their rate of progression could be faster. Learning activities should always include some element of challenge so as to discourage students from adopting the mental model that music lessons and learning are a form of relaxation.

(b) Clear goals should be set for each musical activity and timely and accurate feedback be provided to students on their progress when learning the activity.

(c) Maintain a conducive, non-threatening environment in the music classroom to maximise the potential of music as a self-rewarding and enjoyable activity.

(d) Enable greater student autonomy in the classroom by designing activities that allow students to make musical decisions and encourage them to take responsibility for their own learning.

(e) Leverage on authentic musical activities, learning approaches and pedagogies that are able to engage students and engender meaningful musical learning.

(f) Assessment practices could be more focused on providing feedback to help students improve their musical learning and understanding instead of being more evaluative and performance-centric.

9.9 CONCLUDING REMARKS

In this concluding section, I set out how I believe this research study makes an original contribution to knowledge.

Due to the association of flow with the idea of optimal performance, most flow studies in music education (or indeed most other contexts) have focused on students in the 'specialist' context (North & Hargreaves, 2008) who perform at higher levels, such as students in music conservatories (e.g. Wrigley & Emmerson, 2013) and younger students identified as musically talented or involved in additional musical learning (e.g. Beese & Martin, 2019; O'Neill, 1999). In a similar vein, a study in Singapore examined the flow experiences of students in the School of the Arts, the only high school here specialised in the arts (Garces-Bacsal et al., 2011). This study therefore covers new ground by instead examining the flow experiences of regular students in the 'generalist' context (North & Hargreaves, 2008) who attend 'normal' schools and whose experiences of learning music are not expected to go beyond the school music classroom. The learning and understanding gained from this study on how flow can be better facilitated can therefore cast a wider net and impact a broader group of students.

This study sought to examine the flow experiences of primary five and secondary one students in the music classrooms of Singapore in terms of the nine dimensions of flow, which is the first of its kind in Singapore. While there have been previous studies of flow that have sought to do the same, these have usually adopted a single data source approach of either quantitative (e.g. Wrigley & Emmerson, 2013) or qualitative (e.g. Beese & Martin, 2019; Custodero, 2005) data analysis. As such, this is possibly the first study of flow in the music education context that examines students' flow experiences using a mixed method approach to triangulate the findings of students' experiences by analysing multiple angles. This multi-faceted approach can lead to a more holistic understanding of flow, enhanced by piecing together the macro picture of the students' overall flow experiences through the broad understanding gleaned through the quantitative data analyses, the nuances of those experiences in the students' own words through the focus groups and the authenticity and objectivity of the video observations. This robustness of the research process has resulted in a deeper understanding of how flow takes place in the music classroom in Singapore, especially in terms of how the different dimensions interact with one another. This understanding can be useful in determining how teaching and learning processes in the music classroom can be

strengthened so as to enhance flow to bring about more effective student musical learning experiences.

In the wider flow research context, there is literature that has studied how the flow dimensions inform or influence the flow experience (e.g. Quinn, 2005; Wright et al., 2006) and the role the dimensions can play in positively impacting learning (e.g. Byrne & Sheridan, 2000; Shernoff et al., 2003). This study has sought to combine and value add to the two approaches by seeking to investigate flow as experienced by the students in terms of its dimensions and through the understanding gained, determine which and how the relevant dimensions can be 're-balanced' to bring about stronger flow experiences in order to maximise flow's potential in enhancing musical learning. Through this approach, I believe that we can deepen our understanding of and better leverage flow in music education not just to deliver more meaningful learning, but also to cultivate a stronger intrinsic motivation and long-term interest in music among students so that they can be motivated to continue to be involved in music even after they have left school.

To facilitate the video analysis, a flow observation table (Table 3.5) was also devised as an aide to discerning nuances of flow experiences in the music classroom. While the use of an observation table for flow is not new, Custodero having developed and used FIMA extensively in her research (Custodero, 1998, 1999, 2002), FIMA was designed largely for the purpose of observing musical interactions of very young children who were unable to provide feedback of their flow experiences and hence limited in its potential application. Given that its design is based on the observable traits of the nine flow dimensions, the flow observation table can have a potentially wider application in the observation of classroom music lessons or musical interactions involving groups of students, and even in non-music classes. It is simple to use and can serve as a tool for the researcher to provide a more dispassionate means of identifying the presence of flow in the classroom that can mitigate some of the issues surrounding self-reporting. The actual observations of students engaged in 'flow-like' activities and can also be a powerful means of exploring authentic manifestations of flow in the music learning context and inform teaching and learning approaches. While the use of the table may not in itself be adequate in identifying flow, it can also serve as a useful source of data that can complement other findings made.

In summary and reflection, flow is a complex human experience with uplifting qualities and the potential to positively impact the human condition. Flow is

something that can be experienced and enjoyed by all if we are prepared to invest the necessary effort and energy into what we do. With its inherently enjoyable nature, music has a particular affinity to flow and effortful engagement in music can bring about personal growth. It is my hope that the present study can make a small contribution to advancing our understanding of flow and how judicious planning and conducting of musical activities in the classroom can better facilitate and optimise flow to bring about more meaningful learning experiences and ultimately, human betterment.

REFERENCES

Ainley, M., Enger, L., & Kennedy, G. (2008). The elusive experience of 'flow': qualitative and qualitative indicators. *International Journal of Educational Research, 47*, 109-121.

Alperson, P. (1991). What should one expect from a philosophy of music education? *Journal of Aesthetic Education, 25*(3), 215-242.

Austin, J., Renwick, J., & McPherson, G. E. (2006). Developing motivation. In G. E. McPherson (Ed.), *The Child as Musician: A Handbook of Musical Development* (pp. 213-238). New York, New York: Oxford University Press.

Bakkar, A. B. (2005). Flow among music teachers and their students: the crossover of peak experiences. *Journal of Vocational Behavior, 66*, 26-44.

Beard, K. S. (2015). Theoretically speaking: an Interview with Mihaly Csikszentmihalyi on flow theory development and Its usefulness in addressing contemporary challenges in education. *Educational Psychology Review, 27*, 353-364.

Beese, J. A., & Martin, J. L. (2019). Csikszentmihalyi's concept of flow and theories of motivation connection to the arts in an urban public high school. *Journal for Learning Through the Arts, 15*(1). doi:10.21977/D915135480 Retrieved from https://escholarship.org/uc/item/1m040625

Bell, N. (2008). Ethics in child research: rights, reason and responsibilities. *Children's Geographies, 6*(1), 7-20.

BERA. (2018). *Ethical Guidelines for Educational Research*. London: British Educational Research Association.

Bloom, B. S. (Ed.) (1985). *Developing Talent in Young People*. New York, New York: Ballantine Books.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101.

Bray, D. (2000). An examination of GCSE music uptake rates. *British Journal of Music Education, 17*(1), 79-89.

Burak, S. (2014). Motivation for instrumental education: a study from the perspective of expectancy-value and flow theories. *Eurasian Journal of Educational Research, 55*, 123-136.

Byrne, C., MacDonald, R. A. R., & Carlton, L. (2003). Assessing creativity in musical compositions: flow as an assessment tool. *British Journal of Music Education, 20*(3), 277-290.

Byrne, C., & Sheridan, M. (2000). The long and winding road: the story of rock music in Scottish schools. *International Journal of Music Education, 36*(1), 46-57.

Carey, M. A. (2015). Focus groups. In J. D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences* (2nd ed., Vol. 9, pp. 274-279). Waltham, Massachussetts: Elsevier.

Cohen, L., Manion, L., & Morrison, K. (2011). *Research Methods in Education* (7th ed.). Oxford, UK: Routledge.

Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (3rd ed.). Thousand Oaks, California: Sage Publications.

Creswell, J. W., & Piano Clark, V. L. (2011). *Designing and Conducting Mixed Methods Research* (2nd ed.). Thousand Oaks, California: Sage Publications.

Crotty, M. (1998). *The Foundations of Social Research: Meaning and Perspective in the Research Process*. St Leonards, Australia: Allen & Unwin.

Csikszentmihalyi, M. (1975). *Beyond Boredom and Anxiety*. San Francisco, California: Jossey-Bass.

Csikszentmihalyi, M. (1978). Intrinsic rewards and emergent motivation. In M. D. Lepper & D. Greene (Eds.), *The Hidden Costs of Reward: New Perspectives on the Psychology of Human Motivation*. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Csikszentmihalyi, M. (1990). *Flow: the Psychology of Optimal Experience*. New York, New York: Harper & Row.

Csikszentmihalyi, M. (1992). A response to the Kimiecik & Stein and Jackson papers. *Journal of Applied Sport Psychology, 4*(2), 181-183.

Csikszentmihalyi, M. (1997). Assessing aesthetic education: measuring the ability to “ward off chaos”. *Arts Education Policy Review, 99*(1), 33-38.

Csikszentmihalyi, M. (2009). Flow. In S. J. Lopez (Ed.), *The Encyclopedia of Positive Psychology* (Vol. 1, pp. 394-400). Malden, Massachussetts: Blackwell Publishing Ltd.

Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1993). *Talented Teenagers: the Roots of Success and Failure*. Cambridge, The UK: Cambridge University Press.

Csikszentmihalyi, M., & Schiefele, U. (1992). Arts education, human development, and the quality of experience. In B. Reimer & R. A. Smith (Eds.), *The Arts, Education, and Aesthetic Knowing: Ninety-first Yearbook of the National Society for the Study of Education* (Vol. 2, pp. 169-191). Chicago, Illinois: University of Chicago Press.

Custodero, L. A. (1998). Observing flow in young children's music learning. *General Music Today, 12*(1), 21-27.

Custodero, L. A. (1999). *Constructing musical understandings: the flow-cognition interface*. Paper presented at the Cognitive Processes of Children Engaged in Musical Activity Conference, Urbana-Champaign, IL, USA.

Custodero, L. A. (2002). Seeking challenge, finding skill: flow experience and music education. *Arts Education Policy Review, 103*(3), 3-9.

Custodero, L. A. (2005). Observable indicators of flow experience: a developmental perspective on musical engagement in young children from infancy to school age. *Music Education Research 7*(2), 185-209.

Da Vaus, D. A. (2002). *Surveys in Social Research* (5th ed.). London, the UK: Routledge.

de Winter, J. C. F., Dodou, D., & Wieringa, P. A. (2009). Exploratory factor analysis with small sample sizes. *Multivariate Behaviour Research, 44*(2), 147-181.

Deci, E. L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology, 49*(1), 14-23.

Diaz, F. M. (2013). Mindfulness, attention, and flow during music listening: an empirical investigation. *Psychology of Music, 41*(1), 42-58.

Diaz, F. M., & Silveira, J. (2013). Dimensions of flow in academic and social activities among summer music camp participants. *International Journal of Music Education, 31*(3), 310-320.

Dillon, S. (2007). *Music, Meaning and Transformation*. Newcastle, UK: Cambridge Scholars Publishing.

Elliott, D. J. (1991). Music as knowledge. *Journal of Aesthetic Education, 25*(3), 21-40.

Elliott, D. J. (1995). *Music Matters*. New York, New York: Oxford University Press.

Elliott, D. J., & Silverman, M. (2015). *Music Matters* (2nd ed.). New York, New York: Oxford University Press.

Emerson, H. (1998). Flow and occupation: a review of the literature. *Canadian Journal of Occupational Therapy, 65*(1), 37-44.

Erickson, F. (2006). Definition and analysis of data from videotape: some research procedures and their rationales. In J. L. Green, G. Camilli, & P. B. Elmore (Eds.), *Handbook of Contemporary Methods in Education Research* (pp. 177-191). Mahwah, New Jersey: Lawrence Earlbaum Associates.

Evans, P., & McPherson, G. E. (2014). Identity and practice: the motivational benefits of a long-term musical identity. *Psychology of Music, Online article downloaded from* http://pom.sagepub.com/content/early/2014/01/15/0305735613514471.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272-299.

Fargas-Malet, M., McSherry, D., Larkin, E., & Robinson, C. (2010). Research with children: methodological issues and innovative techniques. *Journal of Early Childhood Research, 8*(2), 175-192.

Feilzer, M. Y. (2010). Doing mixed methods research pragmatically: implications for the rediscovery of pragmatism as a research paradigm. *Journal of Mixed Methods Research, 4*(1), 6-16.

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. London, UK: Sage Publications.

Folkestad, G. (2006). Formal and informal learning situations or practices vs formal and informal ways of learning. *British Journal of Music Education, 23*(2), 135-145.

Freire, P. (1970). *Pedagogy of the Oppressed* (M. B. Ramos, Trans.). New York, New York: Continuum.

Gagné, F. (1985). Giftedness and talent: reexamaning a reexamination of the definitions. *Gifted Child Quarterly, 29*(3), 103-112.

Gagné, F. (2004). Transforming gifts and talents: the DMGT as a developmental theory. *High Ability Studies, 15*(2), 119-147.

Garces-Bacsal, R. M., Cohen, L., & Tan, L. S. (2011). Soul behind the skill, heart behind the technique: experiences of flow among artistically talented students in Singapore. *Gifted Child Quarterly, 55*(3), 194-207.

Green, L. (2002). *How Popular Musicians Learn: A Way Ahead for Music Education*. Aldershot, UK: Ashgate Publishing Company.

Green, S. K., & Hale, C. L. (2011). Fostering a lifelong love of music: instruction and assessment practices that make a difference. *Music Educators Journal, 98*(1), 45-50.

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Towards a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis, 11*(3), 255-274.

Hallam, S. (2009). Motivation to learn. In S. Hallam, I. Cross, & M. Thaut (Eds.), *The Oxford Handbook of Music Psychology*. New York, New York: Oxford University Press.

Hallam, S. (2015). *The Power of Music*. UK: iMerc.

Hallam, S., Creech, A., & McQueen, H. (2011). *Musical Futures: A Case Study Investigation*. Retrieved from London, UK:

Hargreaves, D. J. (1996). The development of artistic and musical competence. In I. Deliège & J. A. Sloboda (Eds.), *Musical Beginnings: Origins and Development of Musical Competence*. New York, New York: Oxford University Press.

Hennink, M., Hutter, I., & Bailey, A. (2011). *Qualitative Research Methods*. London, UK: Sage.

Ho, P. S. K., & Chong, S. N. Y. (2010). The talent development of a musically gifted adolescent in Singapore. *International Journal of Music Education, 28*(1), 47-60.

Howe, M. J. A., & Sloboda, J. A. (1991). Young musicians' accounts of significant influences in their early lives 1. The family and the musical background. *British Journal of Music Education, 8*, 39-52.

Jackson, S. A. (1996). Toward a conceptual understanding of the flow experience in elite athletes. *Research Quarterly for Exercise and Sport, 67*(1), 76-90.

Jackson, S. A. (2012). Flow. In R. M. Richardson (Ed.), *The Oxford Handbook of Human Motivation* (pp. 127-140). New York, New York: Oxford University Press.

Jackson, S. A., & Marsh, H. W. (1996). Development and validation of a scale to measure optimal experience: the flow state scale. *Journal of Sport & Exercise Psychology, 18*, 17-35.

Jenkins, P. (2011). Formal and informal music practices. *Philosophy of Music Education Review, 19*(2), 179-197.

Jewitt, C. (2011). Editorial. *International Journal of Social Research Methodology, 14*(3), 171-177.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: a research paradigm whose time has come. *Educational Researcher, 33*(7), 14-26.

Jorgensen, E. R. (1997). *In Search of Music Education*. Urbana, Illinois: University of Illinois Press.

Kimiecik, J. C., & Stein, G. L. (1992). Examining flow experiences in sport contexts: conceptual issues and methodological concerns. *Journal of Applied Sport Psychology, 4*, 144-160.

Koopman, C. (1998). Music education: aesthetic or praxial? *Journal of Aesthetic Education, 32*(3), 1-17.

Kowal, J., & Fortier, M. S. (1999). Motivational determinants of flow: contributions from self-determination theory. *The Journal of Social Pscyhology, 139*(3), 355-368.

Kreuger, R. A., & Casey, M. A. (2015). *Focus Groups: A Practical Guide for Applied Research* (5th ed.). Thousand Oaks, California: Sage Publications.

Leech, N. L., Barrett, K. C., & Morgan, G. A. (2015). *IBM SPSS and Intermediate Statistics: Use and Interpretation* (5th ed.). New York, New York: Routledge.

Lehmann, A. C., Sloboda, J. A., & Woody, R. H. (2007). *Psychology for Musicians: Understanding and Acquiring the Skills*. New York, New York: Oxford University Press.

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.

Løvoll, H. S., & Vittersø, J. (2014). Can balance be boring? A critique of the "challenges should match skills" hypothesis in flow theory. *Social Indicators Research, 115*(1), 117-136.

Lowe, G. (2011). Class music learning activities: do students find them important, interesting and useful? *Research Studies in Music Education, 33*(2), 143-159.

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods, 1999*(4), 84-99.

MacDonald, R. A. R., Byrne, C., & Carlton, L. (2006). Creativity and flow in music composition: an empirical investigation. *Psychology of Music, 34*(3), 292-306.

Martin, J. J., & Cutler, K. (2002). An exploratory study of flow and motivation in theatre actors. *Journal of Applied Sport Psychology, 14*(4), 344-352.

Massey, O. T. (2011). A proposed model for the analysis and interpretation of focus groups in evaluation research. *Evaluation and Program Planning, 34*, 21-28.

McEwan, R. (2013). Secondary student motivation to participate in a Year 9 Australian elective classroom music curriculum. *British Journal of Music Education, 30*(1), 103-124.

McPherson, G. E., Davidson, J. W., & Faulkner, R. (2012). *Music In Our Lives: Rethinking Musical Ability, Development and Identity*. New York, New York: Oxford University Press.

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.

Miksza, P., & Tan, L. (2015). Predicting collegiate wind players' practice efficiency, flow, and self-efficacy for self-regulation: an exploratory study of relationships between teachers' instruction and students' practicing. *Journal of Research in Music Education, 63*(2), 162-179.

Moneta, G. B. (2004). The flow model of intrinsic motivation in Chinese: cultural and personal moderators. *Journal of Happiness Studies, 5*, 181-217.

Nakamura, J., & Csikszentmihalyi, M. (2002). The concept of flow. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of Positive Psychology* (pp. 89-105). New York, New York: Oxford University Press.

Narita, F. M. (2017). Informal learning in action: the domains of music teaching and their pedagogic modes. *Music Education Research, 19*(1), 29-41.

Ng, C.-H. C., & Hartwig, K. (2011). Teachers' perceptions of declining participation in school music. *Research Studies in Music Education, 33*(2), 123-142.

Ng, H. H. (2020). Towards a synthesis of formal, non-formal and informal pedagogies in popular music learning. *Research Studies in Music Education, 42*(1), 56-76.

North, A. C., & Hargreaves, D. J. (2008). *The Social and Applied Psychology of Music*. New York, New York: Oxford University Press.

O'Neill, S. A. (1999). Flow theory and the development of musical performance skills. *Bulletin of the Council of Research in Music Education, 141*, 129-134.

O'Neill, S. A., & McPherson, G. E. (2002). Motivation. In R. Parncutt & G. E. McPherson (Eds.), *The Science and Psycology of Music Performance* (pp. 31-46). New York, New York: Oxford University Press.

O'Neill, S. A. (2014). Mind the gap: transforming music engagement through leaner-centred informal music learning. *The Recorder: Journal of the Ontatario Music Educators' Association, 56*(2), 18-22.

Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods* (3rd ed.). Thousand Oaks, California: Sage Publications.

Pecca, K. (2000). Positivism in education: philosophical, research and organizational assumptions (Opinion paper). Retrieved from http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED456536 . ERIC Retrieved 27 August 2014 http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=ED456536

Quinn, R. W. (2005). Flow in knowledge work: performance experience in the design of national security technology. *Administrative Science Quarterly, 50*, 610-641.

Reimer, B. (1970). *A Philosophy of Music Education*. Englewood Cliffs, New Jersey: Prentice-Hall.

Reimer, B. (2003). *A Philosophy of Music Education: Advancing the Vision* (3rd ed.). Upper Saddle River, New Jersey: Prentice Hall.

Remedios, R., & McLellan, R. (2009). *Can current theories of motivation inform practice in educational contexts? Goal theory and self-determination theory: theory and current debates*. Paper presented at the Seminar series sponsored by the British Psychological Society, Cambridge, UK.

Renzulli, J. S. (1998). Three-ring conception of giftedness. In S. M. Baum, S. M. Reis, & L. R. Maxfield (Eds.), *Nurturing the Gifts and Talents of Primary Grade Students*. Mansfield Center, Connecticut: Creative Learning Press.

Robson, C. (2011). *Real World Research* (3rd Ed.). Chichester, The UK: Wiley.

Rorty, R. (1999). *Philosophy and Social Hope*. London, UK: Penguin.

Rusinek, G. (2008). Disaffected learners and school musical culture: an opportunity for inclusion. *Research Studies in Music Education, 30*(1), 9-23.

Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: classic definitions and new directions. *Contemporary Educational Psychology, 25*, 54-67.

Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78.

Schaik, P. v., Martin, S., & Vallance, M. (2012). Measuring flow experience in an immersive virtual environment for collaborative learning. *Journal of Computer Assisted Learning, 28*(4), 350–365.

Schmitt, N. (1996). Uses and abuses of coefficient alpha. *Psychological Assessment, 8*(4), 350-353.

Shernoff, D. J., & Csikszentmihalyi, M. (2009). Flow in schools: cultivating engaged learners and optimal learning environments. In R. Gilman, E. S. Huebner, & M. J. Furlong (Eds.), *Handbook of Positive Psychology in Schools* (pp. 131-145). New York, New York: Routledge.

Shernoff, D. J., Csikszentmihalyi, M., Schneider, B., & Shernoff, E. S. (2003). Student engagement in high school classrooms from the perspective of flow theory. *School Psychology Quarterly, 18*(2), 158-176.

Shin, N. (2006). Online learner's 'flow' experience: an empirical study. *British Journal of Educational Technology, 37*(5), 705-720.

Simpson, M., & Tuson, J. (2003). *Using Observations in Small Scale Research*. Glasgow, UK: SCRE, University of Glasgow.

Sinnamon, S., Moran, A., & O'Connell, M. (2012). Flow among musicians: measuring peak experiences of student performers. *Journal of Research in Music Education, 60*(1), 6-25.

Sloboda, J. A. (2001). Emotion, functionality and the everyday experience of music: where does music education fit in? *Music Education Research, 3*(2), 243-253.

Sloboda, J. A., & Davidson, J. W. (1996). The young performing musician. In I. Deliège & J. A. Sloboda (Eds.), *Musical Beginnings: The origins and development of musical competence*. New York, New York: Oxford University Press.

Sloboda, J. A., Davidson, J. W., & Howe, M. J. A. (1994). Is everyone musical? *The Psychologist, 7*(8), 349-354.

Stead, E. P., & Lum, C. H. (2014). The development of the general music programme in primary and secondary schools. In J. Zubillago-Pow & C. K. Ho (Eds.), *Singapore Soundscape: Musical Renaissance of a Global City* (pp. 235-250). Singapore: National Library Board, Singapore.

Stellefson, M., & Hanik, B. (2008). *Strategies for determining the number of factors to retain in exploratory factor analysis*. Paper presented at the Annual meeting of the Southwest Educational Research Association, New Orleans, LA.

Tan, L., & Sin, H. X. (2019). Flow research in music contexts: a systematic literature review. *Musicae Scientiae*, 1-30. doi:https://doi.org/10.1177/1029864919877564

Tashakkori, A., & Teddlie, C. (1998). *Mixed Methodology: Combining Qualitative and Quantitative Approaches* (Vol. 46). London, UK: Sage Publications.

Tashakkori, A., & Teddlie, C. (Eds.). (2003). *Handbook of mixed methods in social and bahavioral research*. Thousand Oaks, California: Sage Publications.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha *INternational Journal of Medical Education, 2*, 53-55.

Teddlie, C., & Tashakkori, A. (2009). *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioural Sciences*. Thousand Oaks, California: Sage Publications.

Treffinger, D. J. (1998). From gifted education to programming for talent development. *Phi Delta Kappan, 79*(10), 752-755.

Valenzuela, R., Codina, N., & Pestana, J. V. (2018). Self-determination theory applied to flow in conservatoire music practice: the roles of autonomy and competence, and autonomous and controlled motivation. *Psychology of Music, 46*(1), 33-48.

Vicsek, L. (2010). Issues in the analysis of focus groups: generalisability, quantifiability, treatment of context and quotations. *The Qualitative Report, 15*(1), 122-141.

Welch, G. F., & Ockelford, A. (2009). The role of the institution and teachers in supporting learning. In S. Hallam, I. Cross, & M. Thaut (Eds.), *The Oxford Handbook of Music Psychology* (pp. 307-319). New York, New York: Oxford University Press.

Wentzel, K. R., & Brophy, J. E. (2014). *Motivating Students to Learn* (4th ed.). New York, New York: Taylor & Francis.

Wright, J. J., Sadlo, G., & Stew, G. (2006). Challenge-skills and mindfulness: an exploration of the conundrum of flow process. *OTJR: Occupation, Participation and Health, 26*(1), 25-32.

Wright, J. J., Sadlo, G., & Stew, G. (2007). Further explorations into the conundrum of flow process. *Journal of Occupational Science, 14*(3), 136-144.

Wrigley, W. J., & Emmerson, S. B. (2013). The experience of the flow state in live music performance. *Psychology of Music, 43*(3), 292-305.

Yardley, L. (2000). Dilemmas in qualitative health research. *Psychology and Health, 15*, 215-228.

APPENDICES

APPENDIX 1 – QUESTIONNAIRE ITEM ADAPTATION TABLE

Adaptation of Shin's (2006) instrument
Note: As Shin's instrument is designed for virtual classes, only suitable items are adapted

Item	Shin	Adapted
1	I enjoy the learning experience this course offers me.	I enjoy learning at music class in school.
2	I am attracted to the subject of this course.	I find what I learn in music class interesting.
3	The lecture content of the course is not boring.	Music classes are not boring.
4	When watching the lecture I am not distracted.	During music class I am not distracted.
5	When intruded by someone while watching the lecture I am annoyed.	When someone disturbs the music class I am unhappy.
6	When watching the lecture I don't surf the internet or things like that.	During music class at school I focus on the activities and do not do other things that have nothing to do with the class.
7	When watching the lecture I have a feeling of concentration.	During music class I feel that I am concentrating.
8	When watching the lecture, I am unaware of what is going on around me.	During music class, when listening to the teacher I am so interested that I am unaware of what is going on around me which is not related to the music class.
9	When the need arises, I put a question on the electronic bulletin board.	When I need help, I ask the teacher.
10	Generally, I am good at exchanging ideas with peers in this course.	Generally I am good at exchanging ideas with my classmates when doing group work in music class.
11	I am responsive to those messages placed by peers or instructors.	When the teacher or another classmate asks a question that I know the answer to, I will say so and respond.
12	I work with peers to cope with tasks or projects required by this course.	I work with classmates to cope with tasks or projects required by the music course.
13	I am unconscious of the passage of time while watching the lecture.	I am so absorbed in the activities in music class that I do not realise time has passed.
14	It feels like time flies while I am watching the lecture.	It feels like time flies during music class.

Item	Shin	Adapted
15	Being occupied with the lecture, I would forget other engagements.	During music class, I focus on what is required and do not think of other things.
16	I have sufficient internet skills needed for this course.	I have sufficient skills to take part in music class activities.
17	I have sufficient intellectual skills to understand this course.	I am able to understand the content of music class.
18	I would be able to take a more advanced course than this.	I would be able to do more difficult topics than what is taught in music class.
19	This course is too demanding for me.	Music class are too demanding for me.
20	It is difficult for me to understand the subject matter.	I find it difficult to understand what is taught in music class.
21	It is hard for me to complete the task required in this course.	I find it hard to complete tasks given to me during music class.

Adaptation of Jackson's (1996) instrument
NB. Jackson's instrument is designed for athletes to record their flow experiences after taking part in an event. The proposed adaptation is intended for the students to reflect on their flow experiences during CCA practices and performances. The items refer to practices unless otherwise stated.

Item	Jackson	Adapted
1	I was challenged but I believed my skills would allow me to meet the challenge.	I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.
2	I made the correct movements without thinking about trying to do so.	During musical activities in class, I play/sing the correct notes without hesitation.
3	I knew clearly what I wanted to do.	I know clearly what is required of me in music class.
4	It was really clear to me that I was doing well.	It is always clear to me when I am doing well in music class.
5	My attention was focused entirely on what I was doing.	During music class, I am totally concentrated on the music making process.
6	I felt in total control of what I was doing.	During music class, I feel in total control of what I am doing.
7	I was not concerned with what others may have been thinking of me.	During musical activities in class, I am not concerned with what others may have been thinking of me.
8	Time seem to alter (either slowed down or speeded up).	During music class, time seems to pass quickly.
9	I really enjoyed the experience.	I enjoy taking part in musical activities.
10	My abilities matched the high challenge of the situation.	My abilities match the difficulty of what we do in music class.
11	I had a strong sense of what I wanted to do.	During music class, I have a strong sense of what I want to do.
12	I was aware of how well I was performing.	During music class, I am aware of how well I am performing.
13	It was no effort to keep my mind on what was happening.	I am able to concentrate on what is happening in music class.
14	I felt like I could control what I was doing.	I feel I can control what I am doing in music class.
15	I was not worried about my performance during the event.	During music class, I am not worried about how well I do as long as I know I am doing my best.
16	I loved the feeling of that performance and want to capture it again.	I love the feeling I get after music class and want to capture it again.
17	I felt I was competent enough to meet the high demands of the situation.	I feel I have the skills and knowledge needed to meet the demands of music class.
19	I knew what I wanted to achieve.	I know what the goals of the music class are.

Item	Jackson	Adapted
20	I had a good idea while I was performing about how well I was doing.	I have a good idea how well I am doing during the music class.
22	I had a feeling of total control.	I have a feeling of control when participating in musical activities.
23	I was not concerned with how I was presenting myself	During musical activities, I am not concerned with how I present myself.
25	The experience left me feeling great.	Taking part in musical activities leaves me feeling great.
27	I did things spontaneously and automatically without having to think.	During musical activities I do things automatically without having to think.
28	My goals were clearly defined.	Clear musical targets are set for us.
29	I could tell by the way I was performing how well I was doing.	I can tell how well I am doing during music class.
30	I was completely focused on the task at hand.	I am totally focused on any musical task given to me.
31	I was not worried about what others may have been thinking of me.	During musical activities, I am not worried about what others may be thinking of me.
32	I found the experience extremely rewarding.	Overall I find taking part in music class an extremely rewarding experience.

APPENDIX 2 – FLOW QUESTIONNAIRE DERIVATION TABLE

		Jackson	Shin	Flow Domain
1	I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.	1		Skill-challenge
2	I would be able to do more difficult topics than what is taught in music class.		SC	Skill-challenge
3	I feel I have the knowledge needed to understand what is taught in music class.	19, 28		Skill-challenge
4	My abilities match the difficulty of what we do in music class.	10		Skill-challenge
5	I know what I want to achieve out of music class.	21		Clear goals
6	Clear targets are set for us in music class.	30		Clear goals
7	I know clearly what is expected of me in music class.	3		Clear goals
8	During music class I have a strong sense of what I want to do.	12		Clear goals
9	I can tell how well I am doing during music class.	13		Unam feedback
10	It is always clear to me when I am doing well in music class.	4		Unam feedback
11	I enjoy learning at music class.	9		Autotelic
12	I love the feeling I get after music class and want to capture it again.	18		Autotelic
13	Taking part in music activities leaves me feeling great.	27		Autotelic
14	Overall I find taking part in music class an extremely rewarding experience.	36		Autotelic
15	I find what I learn in music class interesting.		Enj	Autotelic
16	Music classes are not boring.		Enj	Autotelic
17	During music class I am not distracted.		Foatt	Concentration
18	When someone disturbs the music class I am not happy.		Foatt	Concentration
19	During music class, I focus on the activities and do not do other things that have nothing to do with the class.		Foatt	Concentration
20	During music class, I am totally focused on the music making experience.	5		Concentration

		Jackson	Shin	Flow Domain
21	When listening to the music teacher, I am so interested that I am unaware of what is going on around me that is not related to the music class.		Foatt	Concentration
22	When I need help I ask the teacher.		Foatt	Unam feedback*
23	I am good at exchanging ideas with my classmates and doing group work in music class.		Eng	Unam feedback*
24	When the teacher or another classmate asks a question that I know the answer to, I will say so and respond.		Eng	Clear goals*
25	I work with classmates to cope with tasks or projects required by the music course.		Eng	Clear goals*
26	I am so absorbed in the activities in music class that I do not realise time has passed.		Time	Transform of time
27	It feels like time flies during music class.		Time	Transform of time
28	During musical activities in class, I play/sing the correct notes without hesitation.	2		Action-awareness merging
29	During musical activities, I feel in total control of what I am doing.	6		Paradox of control
30	I feel I can control what I am doing in music class.	15		Paradox of control
31	I have a feeling of control when participating in musical activities.	24		Paradox of control
32	During musical activities, I am not concerned with what others may have been thinking of me.	7		Loss of self-consciousness
33	During musical activities, I am not concerned with how I present myself.	25		Loss of self-consciousness
34	During musical activities, I do things automatically without having to think.	29		Action-awareness merging
35	During music class, I am not worried about how well I do as long as I know I am doing my best.	16		Loss of self-consciousness

4 Skill-challenge – 1, 2, 3, 4
6 Clear goals – 5, 6, 7, 8, 24, 25
4 Unambiguous feedback – 9, 10, 22, 23
2 Action-awareness merging – 28, 34
5 Concentration – 17, 18, 19, 20, 21
3 Sense of control – 29, 30, 31
3 Loss of self-consciousness 32, 33, 35
2 Transformation of time – 26, 27
6 Autotelic – 11, 12, 13, 14, 15, 16

APPENDIX 3 – FINAL FLOW QUESTIONNAIRE

Instructions

The following questions are about your feelings and responses to music classes in your school. When answering the questions, please tick the box that best reflects your agreement/disagreement with the statement given.

This is not a test!

Please respond to each statement truthfully. There are no right or wrong answers.

Thank you!

	About me and music class:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1	I feel that the activities in music class are challenging but I have sufficient skills to meet the challenge.	☐	☐	☐	☐	☐
2	I would be able to do more difficult topics than what is taught in music class.	☐	☐	☐	☐	☐
3	I feel I have the knowledge needed to understand what is taught in music class.	☐	☐	☐	☐	☐
4	My abilities match the difficulty of what we do in music class.	☐	☐	☐	☐	☐
5	I know what I want to achieve out of music class.	☐	☐	☐	☐	☐
6	Clear targets are set for us in music class.	☐	☐	☐	☐	☐
7	I know clearly what is expected of me in music class.	☐	☐	☐	☐	☐
8	During music class I have a strong sense of what I want to do.	☐	☐	☐	☐	☐
9	I can tell how well I am doing during music class.	☐	☐	☐	☐	☐
10	It is always clear to me when I am doing well in music class.	☐	☐	☐	☐	☐
11	I enjoy learning at music class.	☐	☐	☐	☐	☐
12	I love the feeling I get after music class and want to capture it again.	☐	☐	☐	☐	☐
13	Taking part in music activities leaves me feeling great.	☐	☐	☐	☐	☐
14	Overall I find taking part in music class an extremely rewarding experience.	☐	☐	☐	☐	☐
15	I find what I learn in music class interesting.	☐	☐	☐	☐	☐
16	Music classes are not boring.	☐	☐	☐	☐	☐
17	During music class I am not distracted.	☐	☐	☐	☐	☐

	About me and music class:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
18	When someone disturbs the music class I am not happy.	☐	☐	☐	☐	☐
19	During music class, I focus on the activities and do not do other things that have nothing to do with the class.	☐	☐	☐	☐	☐
20	During music class, I am totally focused on the music making experience.	☐	☐	☐	☐	☐
21	When listening to the music teacher, I am so interested that I am unaware of what is going on around me that is not related to the music class.	☐	☐	☐	☐	☐
22	When I need help I ask the teacher.	☐	☐	☐	☐	☐
23	I am good at exchanging ideas with my classmates and doing group work in music class.	☐	☐	☐	☐	☐
24	When the teacher or another classmate asks a question that I know the answer to, I will say so and respond.	☐	☐	☐	☐	☐
25	I work with classmates to cope with tasks or projects required by the music course.	☐	☐	☐	☐	☐
26	I am so absorbed in the activities in music class that I do not realise time has passed.	☐	☐	☐	☐	☐
27	It feels like time flies during music class.	☐	☐	☐	☐	☐
28	During musical activities in class, I play/sing the correct notes without hesitation.	☐	☐	☐	☐	☐
29	During musical activities, I feel in total control of what I am doing.	☐	☐	☐	☐	☐
30	I feel I can control what I am doing in music class.	☐	☐	☐	☐	☐
31	I have a feeling of control when participating in musical activities.	☐	☐	☐	☐	☐
32	During musical activities, I am not concerned with what others may have been thinking of me.	☐	☐	☐	☐	☐
33	During musical activities, I am not concerned with how I present myself.	☐	☐	☐	☐	☐
34	During musical activities, I do things automatically without having to think.	☐	☐	☐	☐	☐
35	During music class, I am not worried about how well I do as long as I know I am doing my best.	☐	☐	☐	☐	☐

Additional questions

What is your gender?
☐ Male ☐ Female

Are you a member of a music CCA?
☐YES ☐NO ☐YES in the past

If yes (or yes in the past), please specify which CCA: _____

and the number of year's experience: _____ years' experience

Do you take regular music lessons or participate in musical activities outside of school? If so please specify the instrument you are learning and/or activity and number of years' experience.

_____

End of questionnaire

APPENDIX 4 – FINAL VERSION OF FOCUS GROUP QUESTION SCHEDULE

Note: Questions are semi-structured

1. How do you feel when you listen to music? Why? Do you prefer to listen to music by yourself or with friends? Do you feel the same when you make music?

2. How do you find music lessons in school? Do you look forward to music lessons? Why?

3. Do you find music lessons interesting? What are the activities that you find interesting? Why?

4. Do you have difficulty understanding what is taught in music lessons? Do you find taking part in music activities in class too challenging?

5. Do you find that time passes very quickly or very slowly during music lessons? Can you remember occasions when time passed quickly or slowly?

6. For students who are members of music CCAs, do you feel different when you take part in music CCA activities as compared to music lessons? In what way and why?

7. How do you feel when you are motivated to learn music? What are things that would motivate you to learn music?

APPENDIX 5 – SAMPLE OF OBSERVATION SCHEDULE

VIDEO ANALYSIS – PS1

Lesson type: singing

Lesson is taught by the school's trained music teacher.

The lesson is for 1 period lasting 30 minutes.

Setting: Class is taught in the school's music room. The room is air-conditioned, has an acoustic wall and generally insulated from the noises from outside. The chairs are stacked away by the side, leaving a large space for activities. The students are seated on the floor in rows. The teacher is preparing the students for Children's Day celebrations, during which a special Children's Day song is always sung.

Minute	Activity description	Flow dimensions noted
0-1	Teacher introduces song to be sung, which is a special song in Malay, *Semogia Bahagia*, for Children' Day. Flashing the lyrics on the projector, she asks if anyone knows the meaning of the song. A student answers that it is about children's future. Students start to talk among themselves. Teacher tells students that if they continue to talk more the time will pass very fast. Students quieten down. Teacher asks a student to read the lyrics in English to the class. Selected student stands up to sporadic applause.	Clear goals
1-2	Student reads lyrics off the screen. Other students listen quietly. In the middle of the reading some other students arrive and sit on the floor. Student finishes reading. Teacher thanks student.	Concentration
2-3	Teacher asks students to summarise what they can remember about the lyrics.	

Minute	Activity description	Flow dimensions noted
	Various students raise their hands. Teacher calls on some to give their answers. Students generally answer correctly along the lines that the lyrics teaches children to behave properly in an upright manner. Students are quietly listening.	 Unambiguous feedback Concentration
3-4	Teacher continues discussion of lyrics with students, going into the detail and what they mean. As students reply, teacher elaborates and asks more questions to fuel discussion. There is sporadic laughter as the teacher cracks some jokes and makes funny comments. Teacher indicates that the students are being videoed. Some students turn and wave into the camera and laugh.	 Unambiguous feedback Autotelic experience

APPENDIX 6 – SAMPLE OF PARENT'S LETTER AND CONSENT FORM

Mr Hoo Cher Liek
c/o UCL Institute of Education
20 Bedford Way
London WC1H 0AL
The United Kingdom

__ January 2016

Dear Parent/Guardian

RE: Request for Consent to Participate in Research Project

I am an Education Officer previously with the Arts Education Branch of the Ministry of Education. I am currently on professional development leave pursuing a PhD in Music Education at the University College London Institute of Education.

As part of my thesis, I am conducting a research study involving _____ students in _____ School. The study aims to investigate the factors that influence students' motivation to learn music in the classroom.

In this connection, I would like to seek your kind consent to allow your child/ward to be involved in this research study. His/her involvement will take one or more of the following forms:

- A survey (to be administered to all students)
- Observation and video recording of a music lesson (one class to be selected)
- Focus group discussion (2 groups of 6-8 students to be selected for a 30-40 minute discussion each after school)

Please rest assured that standard rules regarding research ethics will be adhered to in order to protect the identities of the participating students. Names of students will not be disclosed and the requisite approval to conduct the research project has already been obtained from the Ministry of Education and the school. All research activities will be conducted in the confines of _____ School in Term 1-2 2016.

If you require any clarifications regarding the research project, please do not hesitate to contact me via email at ztnvcl0@ucl.ac.uk or my handphone at 84540516. Please indicate your consent/non-consent in the attached form and return it to your child/ward's form/co-form teachers by _____.

Thank you and I look forward to your support and favourable response.

Yours faithfully

Hoo Cher Liek

PhD candidate,
UCL Institute of Education

CONSENT FORM

To: Mr Hoo Cher Liek

I am the parent/guardian of _____ of Class _____.

I have read the attached letter dated ___ January 2016 and understood its contents.

I consent / do not consent* to my child/ward taking part in the research project.

Signature: _____

Name of parent/guardian: _____

Relationship to student: _____

Date: _____

* delete as required

APPENDIX 7 – PRIMARY SCHOOL COHORT DATA FACTOR EXTRACTION

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14.190	40.544	40.544	14.190	40.544	40.544	6.020	17.199	17.199
2	1.947	5.564	46.108	1.947	5.564	46.108	3.846	10.990	28.189
3	1.393	3.981	50.088	1.393	3.981	50.088	3.128	8.937	37.126
4	1.245	3.557	53.646	1.245	3.557	53.646	3.024	8.641	45.767
5	1.094	3.125	56.771	1.094	3.125	56.771	2.464	7.040	52.807
6	1.047	2.991	59.762	1.047	2.991	59.762	1.748	4.994	57.801
7	1.013	2.895	62.657	1.013	2.895	62.657	1.700	4.856	62.657
8	.940	2.687	65.344						
9	.856	2.445	67.789						
10	.804	2.297	70.086						
11	.770	2.199	72.285						
12	.700	2.000	74.284						
13	.685	1.956	76.241						
14	.646	1.846	78.086						
15	.626	1.788	79.875						
16	.561	1.602	81.477						
17	.538	1.539	83.015						
18	.511	1.460	84.475						
19	.493	1.409	85.884						
20	.463	1.323	87.207						
21	.434	1.239	88.446						
22	.422	1.206	89.652						
23	.388	1.109	90.761						
24	.370	1.057	91.818						
25	.350	.999	92.817						
26	.334	.953	93.771						
27	.321	.918	94.689						
28	.301	.861	95.550						
29	.274	.784	96.333						
30	.258	.737	97.070						
31	.246	.702	97.772						
32	.227	.648	98.420						
33	.202	.577	98.997						
34	.191	.546	99.543						
35	.160	.457	100.000						

Extraction Method: Principal Component Analysis.

APPENDIX 8 – SECONDARY SCHOOL COHORT DATA FACTOR EXTRACTION

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.402	44.007	44.007	15.402	44.007	44.007	4.998	14.279	14.279
2	2.112	6.035	50.041	2.112	6.035	50.041	4.297	12.278	26.557
3	1.776	5.075	55.117	1.776	5.075	55.117	4.182	11.950	38.507
4	1.682	4.807	59.924	1.682	4.807	59.924	3.938	11.251	49.758
5	1.481	4.233	64.156	1.481	4.233	64.156	3.280	9.371	59.129
6	1.229	3.511	67.667	1.229	3.511	67.667	2.988	8.538	67.667
7	.954	2.727	70.394						
8	.921	2.632	73.026						
9	.826	2.359	75.385						
10	.773	2.207	77.592						
11	.676	1.931	79.523						
12	.644	1.840	81.363						
13	.605	1.729	83.092						
14	.555	1.585	84.677						
15	.525	1.499	86.176						
16	.466	1.330	87.507						
17	.455	1.300	88.807						
18	.392	1.121	89.928						
19	.372	1.062	90.990						
20	.347	.991	91.981						
21	.326	.930	92.912						
22	.315	.899	93.811						
23	.285	.815	94.626						
24	.253	.722	95.348						
25	.235	.671	96.018						
26	.224	.641	96.659						
27	.205	.585	97.245						
28	.192	.549	97.794						
29	.167	.476	98.270						
30	.144	.410	98.680						
31	.131	.375	99.055						
32	.114	.325	99.380						
33	.102	.292	99.672						
34	.065	.185	99.857						
35	.050	.143	100.000						

Extraction Method: Principal Component Analysis.

APPENDIX 9 – COMBINED PRIMARY AND SECONDARY SCHOOL COHORT DATA FACTOR EXTRACTION

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14.436	41.246	41.246	14.436	41.246	41.246	5.959	17.027	17.027
2	1.843	5.266	46.512	1.843	5.266	46.512	4.302	12.290	29.317
3	1.373	3.924	50.436	1.373	3.924	50.436	3.225	9.215	38.532
4	1.331	3.802	54.238	1.331	3.802	54.238	3.013	8.609	47.141
5	1.136	3.247	57.485	1.136	3.247	57.485	2.599	7.426	54.567
6	1.008	2.879	60.364	1.008	2.879	60.364	2.029	5.797	60.364
7	.938	2.680	63.045						
8	.885	2.527	65.572						
9	.827	2.362	67.933						
10	.791	2.260	70.194						
11	.761	2.173	72.367						
12	.663	1.895	74.262						
13	.648	1.850	76.112						
14	.613	1.751	77.863						
15	.588	1.681	79.544						
16	.536	1.532	81.076						
17	.511	1.460	82.536						
18	.487	1.393	83.929						
19	.472	1.349	85.277						
20	.456	1.303	86.581						
21	.436	1.246	87.826						
22	.429	1.227	89.053						
23	.404	1.154	90.207						
24	.390	1.115	91.322						
25	.366	1.045	92.367						
26	.343	.979	93.346						
27	.332	.948	94.294						
28	.307	.877	95.171						
29	.303	.866	96.038						
30	.270	.771	96.809						
31	.252	.721	97.530						
32	.236	.675	98.206						
33	.230	.658	98.864						
34	.213	.608	99.471						
35	.185	.529	100.000						

Extraction Method: Principal Component Analysis.

APPENDIX 10 – COMBINED COHORT STUDENTS WITHOUT PRIOR MUSIC EXPERIENCE FACTOR EXTRACTION

Total Variance Explained[a]

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.726	39.217	39.217	13.726	39.217	39.217	5.516	15.759	15.759
2	1.861	5.316	44.533	1.861	5.316	44.533	3.502	10.006	25.765
3	1.622	4.635	49.168	1.622	4.635	49.168	3.501	10.002	35.767
4	1.303	3.722	52.891	1.303	3.722	52.891	2.554	7.298	43.065
5	1.152	3.291	56.182	1.152	3.291	56.182	2.489	7.111	50.176
6	1.095	3.128	59.310	1.095	3.128	59.310	2.251	6.433	56.609
7	1.042	2.978	62.288	1.042	2.978	62.288	1.988	5.679	62.288
8	.969	2.769	65.056						
9	.911	2.603	67.660						
10	.848	2.422	70.082						
11	.782	2.235	72.316						
12	.705	2.014	74.330						
13	.685	1.956	76.287						
14	.655	1.872	78.158						
15	.604	1.727	79.885						
16	.589	1.684	81.569						
17	.547	1.562	83.132						
18	.526	1.503	84.634						
19	.509	1.455	86.090						
20	.479	1.368	87.458						
21	.450	1.286	88.744						
22	.432	1.234	89.978						
23	.398	1.136	91.114						
24	.349	.996	92.110						
25	.343	.980	93.090						
26	.319	.911	94.001						
27	.289	.825	94.826						
28	.282	.806	95.632						
29	.271	.773	96.404						
30	.261	.745	97.150						
31	.253	.722	97.871						
32	.221	.631	98.502						
33	.201	.573	99.075						
34	.170	.486	99.561						
35	.154	.439	100.000						

Extraction Method: Principal Component Analysis.

APPENDIX 11 – COMBINED COHORT STUDENTS WITH PRIOR MUSIC EXPERIENCE FACTOR EXTRACTION

Total Variance Explained[a]

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.398	43.994	43.994	15.398	43.994	43.994	6.619	18.910	18.910
2	1.974	5.640	49.634	1.974	5.640	49.634	4.268	12.195	31.105
3	1.578	4.509	54.143	1.578	4.509	54.143	3.526	10.075	41.179
4	1.422	4.062	58.205	1.422	4.062	58.205	3.106	8.875	50.054
5	1.355	3.871	62.076	1.355	3.871	62.076	3.050	8.715	58.769
6	1.051	3.003	65.078	1.051	3.003	65.078	2.208	6.309	65.078
7	.979	2.797	67.875						
8	.843	2.409	70.285						
9	.830	2.371	72.656						
10	.773	2.208	74.863						
11	.761	2.175	77.038						
12	.649	1.854	78.893						
13	.632	1.806	80.698						
14	.585	1.671	82.369						
15	.561	1.603	83.972						
16	.496	1.417	85.389						
17	.461	1.317	86.706						
18	.411	1.173	87.879						
19	.406	1.159	89.038						
20	.395	1.129	90.167						
21	.383	1.094	91.261						
22	.346	.987	92.249						
23	.338	.967	93.216						
24	.302	.862	94.078						
25	.290	.829	94.908						
26	.253	.723	95.631						
27	.238	.680	96.311						
28	.222	.636	96.946						
29	.203	.580	97.527						
30	.181	.517	98.044						
31	.177	.505	98.549						
32	.154	.439	98.988						
33	.141	.403	99.391						
34	.113	.323	99.714						
35	.100	.286	100.000						

Extraction Method: Principal Component Analysis.

APPENDIX 12 – PRIMARY SCHOOL COHORT STUDENTS WITHOUT PRIOR MUSIC EXPERIENCE FACTOR EXTRACTION

Total Variance Explained[a]

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.459	38.455	38.455	13.459	38.455	38.455	5.290	15.116	15.116
2	1.899	5.425	43.880	1.899	5.425	43.880	3.510	10.028	25.144
3	1.593	4.552	48.432	1.593	4.552	48.432	3.207	9.161	34.305
4	1.362	3.891	52.323	1.362	3.891	52.323	2.583	7.379	41.684
5	1.211	3.459	55.782	1.211	3.459	55.782	2.497	7.134	48.819
6	1.185	3.384	59.166	1.185	3.384	59.166	2.274	6.496	55.315
7	1.070	3.057	62.223	1.070	3.057	62.223	2.066	5.902	61.216
8	1.050	3.001	65.224	1.050	3.001	65.224	1.403	4.008	65.224
9	.965	2.756	67.980						
10	.947	2.707	70.687						
11	.848	2.422	73.109						
12	.750	2.143	75.252						
13	.708	2.024	77.277						
14	.682	1.950	79.226						
15	.624	1.783	81.010						
16	.589	1.682	82.692						
17	.581	1.660	84.352						
18	.554	1.584	85.936						
19	.498	1.423	87.360						
20	.449	1.284	88.643						
21	.419	1.199	89.842						
22	.379	1.082	90.923						
23	.357	1.019	91.943						
24	.317	.906	92.849						
25	.301	.859	93.708						
26	.289	.826	94.534						
27	.286	.818	95.353						
28	.279	.798	96.150						
29	.255	.730	96.880						
30	.233	.667	97.547						
31	.203	.579	98.125						
32	.200	.571	98.696						
33	.177	.505	99.202						
34	.147	.421	99.623						
35	.132	.377	100.000						

Extraction Method: Principal Component Analysis.

APPENDIX 13 – PRIMARY SCHOOL COHORT STUDENTS WITH PRIOR MUSIC EXPERIENCE FACTOR EXTRACTION

Total Variance Explained[a]

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.215	43.471	43.471	15.215	43.471	43.471	6.822	19.491	19.491
2	2.168	6.193	49.664	2.168	6.193	49.664	4.554	13.010	32.501
3	1.548	4.422	54.087	1.548	4.422	54.087	3.306	9.445	41.946
4	1.471	4.202	58.289	1.471	4.202	58.289	2.963	8.465	50.411
5	1.269	3.626	61.915	1.269	3.626	61.915	2.517	7.191	57.602
6	1.165	3.330	65.245	1.165	3.330	65.245	2.159	6.169	63.772
7	1.008	2.879	68.124	1.008	2.879	68.124	1.523	4.353	68.124
8	.918	2.623	70.747						
9	.866	2.475	73.223						
10	.794	2.267	75.490						
11	.756	2.159	77.649						
12	.710	2.028	79.677						
13	.632	1.807	81.484						
14	.605	1.728	83.211						
15	.539	1.539	84.750						
16	.534	1.525	86.275						
17	.473	1.351	87.626						
18	.457	1.306	88.931						
19	.403	1.153	90.084						
20	.386	1.102	91.186						
21	.367	1.048	92.234						
22	.344	.984	93.218						
23	.303	.866	94.084						
24	.273	.780	94.864						
25	.258	.738	95.601						
26	.214	.613	96.214						
27	.209	.597	96.811						
28	.200	.571	97.382						
29	.191	.546	97.928						
30	.158	.453	98.381						
31	.140	.399	98.780						
32	.130	.370	99.150						
33	.120	.343	99.493						
34	.095	.272	99.765						
35	.082	.235	100.000						

Extraction Method: Principal Component Analysis.

APPENDIX 14 – SECONDARY SCHOOL COHORT STUDENTS WITHOUT PRIOR MUSIC EXPERIENCE FACTOR EXTRACTION

Total Variance Explained[a]

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	14.746	42.131	42.131	14.746	42.131	42.131	4.949	14.141	14.141
2	2.196	6.273	48.405	2.196	6.273	48.405	4.108	11.737	25.878
3	2.133	6.095	54.500	2.133	6.095	54.500	4.085	11.670	37.549
4	1.872	5.347	59.848	1.872	5.347	59.848	3.040	8.685	46.234
5	1.640	4.685	64.533	1.640	4.685	64.533	2.624	7.498	53.732
6	1.435	4.099	68.632	1.435	4.099	68.632	2.551	7.289	61.021
7	1.156	3.302	71.934	1.156	3.302	71.934	2.460	7.028	68.049
8	1.012	2.893	74.827	1.012	2.893	74.827	2.372	6.778	74.827
9	.983	2.809	77.636						
10	.887	2.533	80.169						
11	.869	2.484	82.653						
12	.802	2.292	84.946						
13	.608	1.738	86.683						
14	.573	1.638	88.321						
15	.492	1.404	89.725						
16	.420	1.199	90.924						
17	.406	1.161	92.085						
18	.352	1.006	93.091						
19	.327	.934	94.024						
20	.306	.873	94.897						
21	.261	.745	95.643						
22	.242	.693	96.335						
23	.229	.655	96.991						
24	.193	.550	97.541						
25	.175	.501	98.042						
26	.143	.409	98.451						
27	.121	.345	98.796						
28	.104	.297	99.094						
29	.095	.272	99.366						
30	.076	.216	99.582						
31	.056	.160	99.742						
32	.035	.099	99.842						
33	.024	.070	99.911						
34	.019	.055	99.967						
35	.012	.033	100.000						

Extraction Method: Principal Component Analysis.

APPENDIX 15 – SECONDARY SCHOOL COHORT STUDENTS WITH PRIOR MUSIC EXPERIENCE FACTOR EXTRACTION

Total Variance Explained[a]

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	16.532	47.233	47.233	16.532	47.233	47.233	8.026	22.933	22.933
2	2.694	7.698	54.931	2.694	7.698	54.931	4.948	14.136	37.068
3	2.443	6.979	61.910	2.443	6.979	61.910	4.223	12.065	49.134
4	1.788	5.109	67.018	1.788	5.109	67.018	3.417	9.762	58.896
5	1.471	4.203	71.221	1.471	4.203	71.221	3.077	8.791	67.687
6	1.298	3.708	74.929	1.298	3.708	74.929	1.896	5.417	73.104
7	1.206	3.447	78.376	1.206	3.447	78.376	1.845	5.273	78.376
8	.907	2.590	80.966						
9	.806	2.302	83.268						
10	.725	2.072	85.340						
11	.711	2.031	87.370						
12	.582	1.663	89.033						
13	.517	1.478	90.512						
14	.489	1.398	91.910						
15	.420	1.200	93.110						
16	.335	.957	94.067						
17	.300	.857	94.924						
18	.262	.748	95.672						
19	.237	.677	96.349						
20	.222	.635	96.983						
21	.193	.552	97.535						
22	.166	.474	98.009						
23	.150	.428	98.437						
24	.111	.317	98.754						
25	.099	.282	99.035						
26	.072	.205	99.240						
27	.059	.169	99.410						
28	.044	.126	99.536						
29	.042	.121	99.657						
30	.037	.107	99.764						
31	.030	.085	99.849						
32	.018	.053	99.902						
33	.015	.044	99.945						
34	.011	.032	99.977						
35	.008	.023	100.000						

Extraction Method: Principal Component Analysis.