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DURHAM UNIVERSITY

**A case study on exploring the motivation and engagement of the
less academically inclined students in a
Specialised School in Singapore**

**A thesis submitted for the Degree of Doctor of Education
from the School of Education, Durham University**

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School of Education
Durham University UK**

August 2017

A case study on exploring the motivation and engagement of the less academically inclined students in a Specialised School in Singapore

Siew Kim ONG

Abstract

Background: The case study school (CS School) a specialised secondary school that has small class sizes of 20 students, selected teaching staff and a curriculum with 40% devoted to character education and 60% to literacy-numeracy and vocational subjects.

Aim: To what extent are cognitive behavioural changes used to negotiate environmental demands for academic engagement after three to four years of CS School schooling.

Samples: 152 enrolled freshmen (at entry-point) and 134 graduating students (at exit-point); 11 class teachers from each student cohort (n=22).

Method: Using a predominantly quantitative approach, students answered the MES-HS instrument that measured the motivation and engagement factors, and Academic Buoyancy questionnaire that measured daily academic coping. Class teachers answered the Teachers' perceptions of student motivation and engagement and Teachers' enjoyment of teaching questionnaires. Data from students' and teachers' surveys were correlated with graduating students' Youth EQi: YV™ scale scores (exit-point & entry-point data).

Results: No significant difference between freshmen versus graduating students on motivation and engagement factors and academic coping scale. Class teachers indicated that their graduating students were significantly more self-efficacious than class teachers of freshmen. The boys coped significantly better than girls. Students with repeated failure at a high-stakes examination were significantly more stressed and scored significantly lower on EQi adaptability and general mood scales than students who failed the examination once. EQi scale item of stress management was correlated positively to mastery orientation at learning and negatively to uncertainty control, self-handicapping and disengagement; intrapersonal scale was reciprocally correlated to uncertainty control; adaptability, general mood and interpersonal scales were positively correlated to self-belief, valuing school, mastery orientation and time/task management. Students' mastery orientation at learning, persistence and avoiding failure scores were correlated with teachers' enjoyment of teaching. Subtle layers of differentiated motivation and engagement scores contextualised by the different ethnic groups were noted.

Conclusion: Students' success at controlling stress correlated with EQi adaptability, general mood and interpersonal scales that were associated with self-efficacy, valuing school, mastery orientation in learning focus and time management. A model of motivating the less academically inclined students to being engaged with schooling following a temporal learning process of sustained stress control and classroom engagement is proposed.

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Declaration

This thesis is the result of my own work. Material from the published or unpublished work of others which is referred to in the thesis is credited to the author in question in the text. Research ethics issues have been considered and handled appropriately within the Durham University School of Education guidelines and procedures.

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Acknowledgments

First, a big THANK YOU to the two Headteachers (Founding and current), Vice Headteacher, class teachers and school children of the case study school. I am very much gratified to be given the opportunity and indebted to your participation in this case study research.

My heartfelt appreciation goes to my two supervisors, Professor Lynn Newton and Professor Richard Smith at School of Education, Durham University for being there. Yes, to Professor Newton who has been pivotal in ensuring that my thesis is within specification and of quality: thank you for the numerous phone calls from Durham. Your care and understanding of my predicaments have been outstanding!

I am grateful to Professor Andrew Martin, Professor of Educational Psychology School of Education, University of New South Wales, Sydney, Australia for his permission to use his questionnaires on Academic Buoyancy, Teachers' perception of students' motivation and engagement, and Teachers' enjoyment of teaching.

Special honour to have a conversation with three Professors on the different aspects of the thesis write-up. In no particular order, many thanks to Dr. Paul A O'Keefe, Assistant Professor, Social Sciences (Psychology), Yale-NUS College, National University of Singapore, Dr. Bobby Cheon, Assistant Professor, Psychology, School of Social Sciences, College of Humanities, Nanyang Technology University, Principal Investigator, A*STAR, Singapore Institute for Clinical Sciences, Brenner Centre for Molecular Medicine and Dr. Kuar Berinderjeet, Professor, Department of Mathematics & Mathematics Education, National Institute of Education, Singapore.

A very special honour to have several conversations with Dr. Gregory Arief D. Liem, Associate Professor, Department Psychological Studies, National Institute of Education, Singapore. Thank you Prof. Liem!

There are two important people: Heather Chi and Tang Yew Seng of whom I am forever grateful. Thank you for the polite comments on my writing. Also, my thanks to another teacher who shared his pedagogy insights on CS School.

Finally, many hugs to my family for their staunch support. This doctorate seems like a marathon between works, duties and self-actualisation. We moved homes; I changed jobs. Meanwhile, my children grew up, got married and have children too.

Woosh, I am here at last!

Dedication

My family, especially to Gabrielle, Gracia & Gideon.

Chapter One. Introduction and Rationale

1.1. Singapore Education System and Bilingualism

Singapore’s Education System has gone through stages of reforms with various policies enacted since its independence in 1965. The initial phase was nation building - politically, economically and culturally. Table 1 tabulates education reforms in every decade, each with the appropriate changes to education’s major focus such as citizens’ commitment to a multicultural society, acquiring knowledge/skills for gainful employment that ensure continuous competitive economic growth and toward well-being for all students (Low & Toh, 1992; Deng, Gopinathan & Lee, 2013).

Table 1: The education system over the years

1960s: Survival-driven phase	1970s: Efficiency-driven phase	1980s: Ability-driven phase	1990s: Thinking Schools, Learning Nation	2000s: Teach Less, Learn More	2010 & beyond: Every School a Good School
Built schools, School Enrolment Increased, basic curriculum, started PSLE ¹	Education system: 6-4-2 ² system, one standardized curriculum, 3 exams - PSLE, "O" GCE level and "A" level. 1978: Report on "wastage" of high failure and high attrition rate at examinations, low literacy and ineffective bilingualism.	1979: New Education System ³ endorsed. Two ability streams at Primary 4 and Secondary School. 1984: Gifted Education started. 1987: Teachers allowed pedagogical adaptation. 1987: English as instructive pedagogy.	1997: Launch of a masterplan for IT, New vision- "Thinking Schools, Learning Nation", nurture thinking and lifelong learning. Curriculum content reduced 30%. Training hours of every teacher at least 100 hours per year (by 2000).	2004: Launch of vision "Teach Less, Learn more". Educators to teach better, engage students and prepare them for life instead of teaching for exams. 2008: Scrapped Primary stream for weaker students.	2012 launch vision: "Every School A Good School". To mitigate anxiety among parents of students who are in "branded schools" or "neighbourhood schools". Ministry stopped releasing top scorers at exams. 2016 change PSLE scoring system.

Note: ¹PSLE: Primary School Leaving Examination; ²6-2-4 refers to 6 years of primary, 4 years of secondary, and 2 years of pre-university education. Source: Tan, (2012). "Education in Singapore: taking stock, looking forward", Pearson, Singapore; Gopinathan, (2013). "Education and the nation state: the selected works of S. Gopinathan", Routledge, New York.

The rapid changes in the education structure were commendable because they led to a rapid academic improvement at PISA¹ 2009 by Singaporean students between 1986-1995 (OECD, 2010). However, PISA 2009 measures showed a 'long-tail' (defined by mean-5th percentile score) in performance distribution. As such, the Ministry of Education (MOE) has since focused its efforts on levelling up academically low-achieving students using 'ladders and bridges' strategies such as early intervention programmes to help lower achieving students to be 'school-ready'. Another levelling up strategy was providing specialised schools such as Case Study² School³, where less

¹ The Programme for International Student Assessment (PISA) is a triennial international survey which aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students. Students were assessed in science, mathematics, reading, collaborative problem-solving and financial literacy during the internationally agreed two-hour session. Its parent organisation is the Organisation for Economic Co-operation and Development (OECD).

² Case study is study of a singularity conducted in depth in natural settings (Bassey, 1999, p. 47).

³ Case study School (CS School) is codenamed of the Specialised Secondary School that this research was conducted. It enrolls students who could not get placements at mainstream secondary schools after their primary education. It provides continuous education for students (to stay longer in a school) and life-long learning. References denoted by (CS, ...) linking to the CS School are available with this case study researcher.

academically inclined students could continue their education studying a curriculum that is customised to help them acquire skills and knowledge (Teh, 2014, pp. 78-79). Overall, the education system is positioned to bring out the best in every child (MOE, 2017).

1.1.1. Statement of the research area

This is a personal statement on my career history. I am a clinical chemist and an educator in diagnostics of human health and in pathology for 25 years. Life-long learning is my aspiration. I am starting my “grain-size” knowledge on educational motivation and engagement through a use-inspired basic research model that focused on the “twin goals of scientific understanding and providing useful information that can help solve practical problems” (Pintrich, 2000a) at the Stokes’ Pasteur’s quadrant (Stokes, 1997).

In this case study, I will concentrate on 286 students: entry-year freshmen (n=152) who were have completed their six years of primary education from 187 primary schools in Singapore (MOE, 2014a) and the final-year graduating students (n=134) who were current students at CS School (CS, 2006). Students were aged from about 12 to 19 years - adolescents whose general interests and motivation seem to be in decline (Martin, 2012a).

These negative downward trends toward schooling had been associated with contextual or environmental factors (Meece & Eccles, 2010). From a social-cultural angle, ethnic Chinese, Malay and Indian students were found to exhibit educational differential. But collectively it ‘revealed that the underclass and academic underachievers across all ethnic communities tend to share a low sense of self-esteem and often give up trying to persevere particularly after repeated failures in school’ (Rahim, 1998, p. 240). The author further elaborated that ‘many of the academic underachievers and problem students are from lower income families, single parent, and emotionally dysfunctional family environments’ (*ibid.* p. 241).

Self-esteem as defined by Oxford Dictionary as “confidence in one’s own worth or abilities; self-respect”. Self-esteem is crucially linked to the confidence and motivation that is needed by students to participate in and achieve educational pursuits (Ferkany, 2008). It can be facilitated socially through teacher-student interactions and student-school’s social environment. The academically low-achieving students at the CS School will learn to manage their emotional quotients intelligence (EQi)⁴ by immersing in programmes led by teachers such as enhancing self-

⁴ EQi of the CS School students were measured by Bar-On Youth EQi: YV™ (Bar-On & Parker, 2000). The five scales of EQi competencies are intrapersonal, interpersonal, stress management, adaptability and general mood.

esteem through promoting competence in domains that are appropriate to the student's individual needs. Increasing competencies and self-perceptions have been shown to promote self-concept and self-esteem in learning experientially (Manning, 2007). Consequently, this would lead to the acquisition of skills and knowledge that are both instructional and non-instructional aspects of vocational education.

1.1.2. Acquiring character (values) education

Broadly, schools transmit values via their curriculum (both formal and informal) and through personal interaction between teachers and their pupils. Values are being promoted as a reflection of the society's values. Socialisation process begins at home and children acquire the primary values via the significant other (Edward, 1985). The school system represents the secondary socialisation process that creates the future society. In general terms, values are defined as things that are considered 'good' in themselves, for example, Russian children consider value in "being educated" and as personal or social preferences (Elliott & Hufton, 2003).

In *Philosophical Reflections for Educators*, Tan (2008) wrote that values in education refers to excellence or dispositions that are part of one's character or as Aristotelian values or virtues (Tan, 2008, p. 23). That, there is necessary goodness in values because of its good demonstration of both intellectual and moral virtues. The intellectual virtues are 'cultivated through instruction because they are amenable to reason, and the moral virtues through habit or practice' of controlling and directing one's emotions or desires (*ibid.* p. 25). In education, it is significant that "being educated" implies being able to tell the right from wrong (*ibid.* p. 70).

Values are complex and powerful components of the human person that are consciously or unconsciously embedded in our thoughts and operationalize through our behaviours and emotional self. Educators thus would strive to promote the transmission of values either by inculcated method of the direct deliberate promotion or by socialisation via the assumed passivity transfer.

At school, values are integrated into the national curriculum which expresses as developing and valuing multicultural cohesion (in primary schools), protecting homeland and developing the selves (in universities). Apart from attaining nationalistic objectives, values in skills acquisition and being employed are the hallmark of vocational education. Vocational jobs are values-laden and are meaningful occupations (Halliday, 1996). Inducting someone into a practice is a form of values education. In Singapore, character development curriculum is included as a "desired outcomes of

education”⁵.

Parents are encouraged to nurture their children with appropriate values (as defined by society) and instil them with right attitudes to life and work. In addition to the spirit of competitiveness and hard work, the students’ self-advancement is carried over from classroom to extra-curricular activities where participation is translated to “points” advantageous for placement at tertiary education level. Values thus gained are being translated to reward for talent, to be a good citizen and to be employed. The system also provides pathways to vocation training in preparation for job placement or for further education at a technical institute.

1.1.3. Meritocracy and Streaming⁶

A young Singaporean student is impressed upon by him or her teachers and parents that examinations are selection mechanisms. Students must do their part before they get to advance to the next stage for more paper qualifications. Hence the emphasis is to encourage students to score high marks and pass their examinations. Failure to attain good grades can mean an end to academic education or a longer and/or more expensive path to further education. Any Singaporean student understands this prospect when facing the national examinations (Table 1).

Ability streaming and bilingualism (mother-tongue languages and English) remain the cornerstones of Singapore’s education system. With streaming, the brightest students at Primary School level are streamed as “gifted” students and are nurtured with a special curriculum (MOE, 2016b). This type of selection seems to fit the characteristic of an ideal type of “sponsored mobility” based on Turner’s description in the 1960s (Turner, 1998). Despite displaying sponsorship tendencies, MOE has placed structures in place to allow all children to be schooled in a fair, yet be competitive environment within school (Heng, 2014). This structural build also meant to mitigate the downstream realities of streaming. Because the effect streaming has been shown to potentially and inadvertently delineate particular ethnic groups or a particular class based on students’ academic performance.

⁵ Desired Outcomes of Education - a confident person, a self-directed learner, an active contributor, a concerned citizen (MOE, 2016a).

⁶ The streaming policy was originally implemented in 1979 and subsequently modified in 1991 to stream students into EM1, 2 and 3 when children reach Primary Four, typically at age 10. This streaming policy was abolished in 2007 and replaced with subject banding, where students take subjects at different levels of difficulty, based on parental and school decision. (Information retrieved from various MOE review committee reports in 1978, 1991 and 2009.)

On the whole, the high educational academic achievement at international level⁷ is not prescriptive but a systematic organisation of policy curriculum, programmatic curriculum and classroom curriculum (TIMSS-PIRLS, 2014). Realising the complexities of educational policy and its challenges of pressure of high-stakes examinations, high parental expectations, long-tailed of underachievement and effect of socioeconomic status on students' academic achievement, the setup of Secondary CS School seems timely (Deng, Gopinathan & Lee, 2013).

1.1.4. Primary Education

In the Singapore educational landscape, primary schooling ends with the nationwide Primary School Leaving Examination (PSLE). For primary students, high PSLE results are synonymously as equal to merits. The results also routed students to different secondary schools with standardised mainstream⁸ curricula according to the different education tracks or streams (Lim, 2016, pp. 118-119). Thus, the meritorious students would be streamed in order of high merits into four tracks starting from 'Special', 'Express', 'Normal (Academic)' to Normal (Technical)'. Following which the students could move up to any of academic levels: junior college, pre-university, polytechnic, the Institute of Technical Education⁹ (ITE) or other specialised schools/private institutions.

In summary, formal education is structured via early development of 'bright' young children who have acquired the merits of the education system. The twin national beliefs of meritocracy and multiracialism have displayed contradicting expectations of fairness. Therefore, the resultant explanation of a population of minority races that lag behind in educational attainment and income (Rahim, 1998; Bakar, 2004). In this educational conundrum separating the gifted and mainstream students, there are still about 0.5% of the less academically inclined students from primary schools left behind with no access to mainstream secondary schooling (Tan, Poon, Chew & Lim, 2014, p. 4).

1.2. Rationale for the study

⁷ TIMSS: Trends in International Mathematics and Science Study; PIRLS: Progress in International Reading Literacy Study. Both are comprehensive assessment of mathematics, science and reading, operate under the auspices of the International Association of Evaluation of Educational Achievement (IEA).

⁸ A mainstream school is any school that principally meets the needs of pupils who do not have specialised educational needs.

⁹ Institute Technical Education provides National ITE Certificate (Nitec) and Higher Nitec courses that aspiring the CS School graduates with Certification could pursue further academically. <https://www.ite.edu.sg/wps/portal/fts#>

1.2.1. Nature of the research

From 2007, the academically disaffected and less academically inclined 13 year-olds could choose to continue their secondary education at the CS School. Its curriculum comprises 40% on character education¹⁰ with the rest of the 60% equally divided emphasis on numeracy-literacy and vocational subjects. The CS School¹¹ focuses on vocational education via character building to motivate and engages these less academically inclined students to learn values and skills for future employment.

At the CS School, values are being taught together with lived experiences. A character education programme would influence development of good character and desirable attributes such as positive attitudes toward motivation in academic achievements and sense of purpose in life. Therefore, in addition to addressing specific problems such as under-achievement and failures, character education could develop an individual intellectually, socially, emotionally and ethically (Goh, et al., 2009, pp. 1-5). The collective experience of a CS School student would be the acquisition of knowledge and skills cumulated through classroom learning. In addition, the student would acquire values such as overcoming challenges and resilience. These would be acquired through its pedagogy and assessment via the learning style of the students: 70% experiential learning and 30% theory.

I am interested in how CS School manages to successfully turn around academically weak students. Prior to the CS School being set up, these less academically inclined students would have to study at a secondary vocational school (now defunct) that had a high attrition rate of 60%. This rate has been reduced to 10% at the CS School. In fact, the percentage of graduating students with skill certification has doubled to 80%. This raises questions: What makes the students stay longer at the CS School and achieve better academically? What is the secret behind the CS School's success? The answers to these questions would make it possible to transfer the successful practices of motivating the less academically inclined students in other schools to study.

Answering the questions led me to think of why the CS School is classified as a specialised school. First, the classroom teacher to pupil ratio is 1:20 compared to an average of 36 students per class at mainstream school. Smaller student class sizes could perhaps encourage more interaction

¹⁰ The "7 Essentials Character Discipline" teaches a student to realise positive classroom behavior is self-motivational to academic success in the learning environment. Positive educational environments would help students develop daily characteristic of self-esteem, positive self-concepts and respect for self as well as others (Davis-Johnson, 2001).

¹¹ The CS School focuses on a weekly character trait, e.g., humility, forgiveness, responsibility, honesty. A total of 40 characters' traits are placed prominently around the school compound.

opportunities between teachers and students, and between students. Thus, encouraging peer learning that is conducive for adolescence learning. Second, teachers are specially selected based on their experience. They are trained to be emotionally competent, to be affective and effective in nurturing students under their care. They are to believe that teachers' efficacy will be a positive motivational factor to encourage learning. Third, the rather high proportion of time spent in character education could be associated with its capacity in teaching students to become socially and morally responsible young adults who would continue to be life-long learners, fulfilling the objective of the CS School (Lickona, 2004).

In addition, for the examination-averse CS School students, failure at a school assessment is detrimental to students' self-esteem (Rahim, 1998). Hence, instead of one crucial final examination, students learn through a continual assessment process based on a routed feedback mechanism. This facilitates a continuum of learning when preparing them for technical and skill-based competency jobs. Affected students arriving at the CS School are well-informed that this would be their second chance at schooling (CS, 2014). In essence, the CS School invariably tries to influence students' motivation towards education and fuel their academic aspiration by valuing the curricular content and attitude towards learning. At the CS School, it represents a change in environment, a new start, to make new friends and realise interconnectedness of learning opportunity with other less academically inclined students, new instructional programmes, develop new/renewed interest and be engaged in academic tasks satisfactorily. This study will aim to assess how the students develop cognitively and become engaged learners during their stay at the CS School.

It is true that a good school is defined by the quality of its teachers' ability to deliver lessons effectively through lessons adaptation at classroom level via a 'belief system of teachers (who) heavily influence their students' possibilities of success' (Blankstein, 2010, p. 33). Teachers are key to successful academic attainment and their enthusiasm was the most powerful unique predictor of students' intrinsic motivation and vitality (Patrick, Hisley & Kempler, 2000). Moreover, more effective teachers are related to higher performing students than less effective teachers (Gollnick & Cinn, 2006, p. 129). Singapore teachers' quality was cited to be key contributor to high performing school system (McKinsey-Report, 2007). Thus, interactions with school leadership, students and the community can provide a culture with positive school environment conducive for successive learning (Hinde, 2004). Seeing this positive culture at the CS School, it is imperative that students would learn how to cope with their daily school life. This would lead to successful academic buoyancy and a predictable learning engagement (Martin & Marsh, 2008).

My hypothesis is that an integrative framework of motivational components derived from the perspective of educational psychology theories have contributed to a change necessary for positive outcomes: the CS School students' ability to successfully deal with failure and setbacks, play out the failure dynamics (fear of failure and shame), be engaged in learning and be in control of academic achievement - the beliefs, effective responses and behaviours that are positively associated with persistence and negatively with disengagement and anxiety (Covington & Omelich, 1985; Finn, 1993; Dweck, 2000). By examining student-focused variables such as students' psychological and school engagement factors, this research intend to establish a link between cognitive pathways and desirable outcomes. Thus, it is possible to identify the positive educational psychology constructs and explore any alignment that could conceptualise and inform educators of the relevant cognitive and behavioural fundamentals in education. These findings could impact educational interventions on academic improvement at school and classroom levels.

This research used a case study approach with a focus on one case study school to explore the motivation and engagement parameters of the less academically inclined students who have failed an upper primary school examination (uPE¹²) prior to their enrolment. It will integrate the measurement of students' motivation and engagement dimensions and academic coping scale with teachers' perception of students' motivational approach to vocational studies. As teachers' enjoyment of teaching has positive impact on students' motivation, a question on teachers' joy of teaching at the CS School would be incorporated.

The CS School's schooling method is viewed as an intervention for learning for the less academically inclined students. The intended outcome of a successful CS School student will be a meaningful transition from school to graduating with inculcated societal values.

This case study would provide data from real lived experiences of students who had experienced failure in a high-stakes¹³ examination that could determine their education pathways. Though it lacks the generalisation capacity to coalesce into theory but it could add one more brick in the building of the educational knowledge system. It could provide opportunity for teachers who work with similar groups of students described in this study to relate to their situations. In essence, the relatability of this case study research is more, or as, important than its generalisability of a large study (Bassey, 1981). The convergence of this case study's measurements with the students'

¹² uPE is codenamed for a high-stakes examination and is used for this research. A uPE pass meant that the student could eventually continue his education at a mainstream secondary school.

¹³ High-stakes examination refers to an examination or test that is administered to determine educational decision. For example: Singapore Primary School Leaving Examination determines student placement into particular secondary schools.

emotional quotients would inform the relevance and importance of a lived experience and the motivational aspects of learning.

1.2.2. The research questions

Main: To what extent are cognitive behavioural changes used to negotiate the environmental demands for academic engagement after three to four years of the CS School schooling? The sub-questions are:

- a) What are the motivational changes in the cognitive and behavioural factors of the students?
- b) To what extent do the less academic students negotiate academic buoyancy in their resilience to overcome academic failure?
- c) Which aspects of the cognitive and behavioural dimensions do class teachers¹⁴ perceived in their students' academic engagement (entry level cohort compared to graduating cohort)?
- d) To what extent is student motivational academic outcome related to teachers' enjoyment of teaching?

1.2.3. The significance of the research

The socio-cognitive interpretation of low academic achievement is related to elements of self in educational situations. Central to this research, motivational studies have shown that students' academic performance improved when strategies such as the introduction of new interventions, design projects, reformed curricula and innovative technological tools were used.

In line with educational psychology of motivational processes and principles of engagement, this case study will explore and describe relevant conceptual knowledge on learning and development of cognitive-based inferences. It covers what educational researchers have contributed to finding ways to enhance the academic achievement of students. Therefore, this research will be directed at motivation and engagement variables such as students' perceptions of their involvement in learning, studying strategies and the cognitions associated with their goal orientations.

Participating students and their class teachers will self-report on students' behavioural and cognitive components. The tangible outcomes are that the less academically inclined students stay longer in schools and graduate with specific skills to be independent as working adults instead of

¹⁴ In this case study, a class teacher (or form teacher) was the teacher-in-charge (administration etc.) of a class.

dropping out of school (Drop-out, 2016). Singapore's school dropout rates have decreased from 5.3% in 1997, to 1.2% in 2009 (Balakrishnan, 2011). At policy level, the decline reflects initiatives and efforts by MOE to address students who are at-risk¹⁵ of dropping out from school early. It is meaningful to identify the motivational features that are associated with students' engagement as understood by the students and perceived by the teachers at the CS School. Findings of this case study intend to uncover and recommend any transferable skills or knowledge that could change the students' behavioural or cognitive inference, identify any gaps that could add to the repertoire of initiatives/interventions that will increase students' motivational and engagement in acquiring skills for themselves in reading, numeracy and technology.

Data from MES-HS instrument (Martin, 2012b) and Academic Buoyancy (Martin & Marsh, 2008) questionnaire measurement will be correlated with graduating students' Youth EQi: YV™ instrument EQi scales that were measured by the CS School. Graduating students had their EQi scales measured when they were freshmen (entry-point) and during their graduating year (exit-point). Convergence of students' data with teachers' instrument data would be knowledge of lived experiences and learning at the CS School.

1.2.4. Overview of the thesis

Chapter One consists of introduction and rationale for the study: the Singapore education system, rationale of the study with research questions and its significance, and an overview of the thesis. stud

Chapter Two provides an overview of literature on motivation in education touching on gender, ability and effort, social and economic environment, definition of engagement and disengagement, and the impact of culture on education. Specific interaction forces and how these will affect the Singaporean home. This chapter also covers the CS School education, and relevant theories on motivation and engagement in educational psychology research, teachers' perception on students' learning, academic coping and a summary.

Chapter Three covers the unifying framework of educational psychology theories on student motivation and engagement (theme and issues), methodology, including the focus on the quantitative measurement, research design, and administration of the data collection procedure.

¹⁵ The term "at-risk" here refers to a student who is likely to fail at school. In this context, school failure is typically seen as dropping-out of school before secondary school graduation. Some "at-risk" characteristics include academic difficulties, lack of social skills, fear of failure (Lehr & Harris, 1988).

Chapter Four shows the research findings and analysis (overall descriptor, comparison between exit-point versus entry-point scores, correlation on scores between the different instruments, partition analysis on gender, ethnicity and failure status of students when they were freshmen). A summary at each section on students, class teachers and EQi scale findings. These findings would be correlated and integrated with interpretation on relevant motivation and engagement variables and specific mention of failure at examination aspects on students' EQi scales and MES-HS dimensions' factors data.

Chapter Five presents the overview of findings and the answers to research questions in this case study with discussion on academic coping, ethnicity and gender, teachers' perspectives, an attempt at comparing MS-HS data of this case study with mainstream school and convergence of the different layers of data contributed by different instruments, followed by limitations of the study, how I would do the study differently and some recommendations. It also includes a comparison of this case study with a mainstream school and the convergence of different aspects of students and class teacher findings that resulted in a unique presentation of a model on motivation of the less academically inclined students from failing to positive schooling.

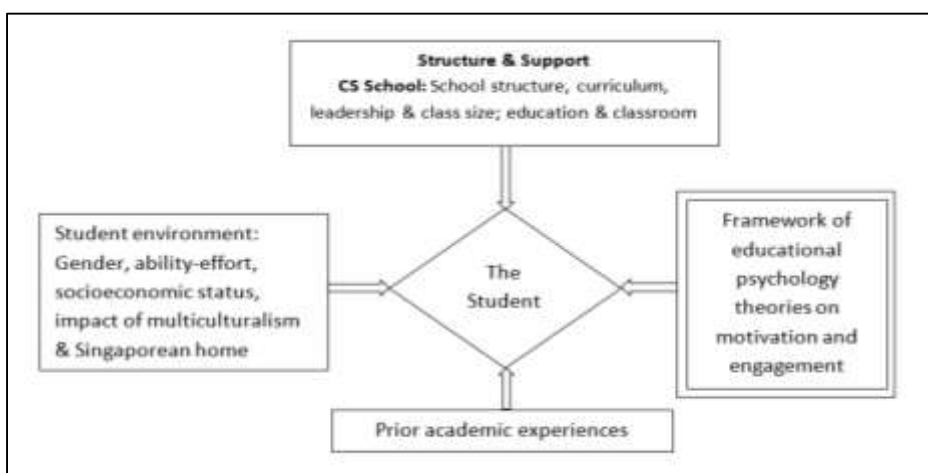
Chapter Six is the conclusion of motivation and engagement process, the temporal sequences of the re-engagement model and concluding remarks of this case study research.

Chapter Two. Literature review on motivation and engagement in educational psychology research on learning and teaching contexts

2.1. Introduction

The approach to the literature review is depicted in Figure 1 where a student is central to learning, bringing with him prior encounters of educational determinants and to learn anew at the CS School.

Figure 1: Forces interacting in a student learning, motivation and engagement



In this section, I will review educational psychology variables such as gender effects in education, perceptions of the ability-effort continuum, the family socio-economic status and cultural insights that have been associated with academic outcomes. Interacting with students' background and their prior academic experiences are the CS School and its ecological factors that contribute to students' learning through educational psychology theories on motivation and engagement.

2.1.1. What is motivation in education?

The term "motivation" is derived from the Latin verb "movere" which means "to move". In motivational researches, the theories attempt to answer what it means to get a student moving (energising) toward particular activities or tasks. It is a combination of action and behavioural attitude (Pintrich & Schunk, 2002). Researchers summarise motivation as 'an internal state that energises, directs, and maintains behaviour towards a goal' (Tan, Parsons, Hinson, & Sardo-Brown, 2011). Included is "arousal", a physical and psychological state of readiness to alert and attentive

(ibid. p. 316). Yet “arousal”¹⁶ state is described to be motivational when it is appropriate in its ability to evoke learning and academic performance (Cassady, 2004). Yet high arousal level may elicit the “anxiety” state that could impede learning.

Motivation is a multilevel construct with multiple pathways for energisation and direction of behaviour. Because motivation is a subjective experience, self-report instruments are used to measure it directly. Other studies have used methods such as observational measurement of performance behaviour in task engagement (Elliott & Hufton, 2003, p. 158). Motivation may vary depending on time-based individual factors rather than variability such as choices and interest (Sansone, Thoman & Smith, 2010).

The two conventional models of motivation are: intrinsic motivation, referring to activity that an individual is engaged in because he is interested and enjoys the activity and rather than while extrinsic motivation referring to activities that the individual is engaged in for reasons such receiving a reward. Researchers mostly emphasised intrinsic motivation to influence students’ learning and academic achievement (McInerney, Marsh & Yeung, 2003).

Some students stay motivated, sustained and engaged through self-efficacy while others are motivated by hard work because of their goals, beliefs, values that lead to achievement that could be a result of either extrinsic or intrinsic motivation or a continuum of amotivation (being not motivated) to intrinsic motivation (Deci, Vallerand, Pelletier & Ryan, 1991; Saeed & Zyngier, 2012). Motivation encompasses both cognitive behaviours such as monitoring and strategy use (Meyer & Turner, 2006) and non-cognitive aspects such perceptions, beliefs and attitudes or both as in curiosity, persistence, and learning challenging, difficult and novel tasks (Gottfried, 1990).

The component to “move” — acting or behaving in a particular way that initiate the act of movement to learn — involves biological, emotional, social and cognitive forces, the hierarchy of general biological/physiological needs (for food, shelter, security) starts at the base while at the peak is the unique human self-actualisation (Maslow, 1971). If the former is not satisfied, the latter will not be attained as it requires a safe learning environment for the learner-students, in which they feel secure and can take on learning risks (Darby, 2005).

¹⁶ State of arousal is the emotional state which students could rely on to judge whether or not they are capable of doing something successfully. This physiological state evokes success if they are not nervous. Hence, fear and anxiety created by anticipation of stress in an upcoming task may reduce the sense of belief in oneself (self-efficacy). Thus, by reducing anticipatory fear, self-efficacy would increase performance (Tan, et al., 2017, pp. 440-441).

In summary, the students' needs to "move" and reasons "to move" are internal in origin, affective in nature, contextual in goals and in an environmental reality with both safety and biological needs fulfilment. Hence, student motivation of learning is moved by internal desire to satisfy a need to act and (willingly) accede to behaviours that lead to learning.

2.1.2. Gender effect in education

The socio-cultural norms suggest that there are challenging masculine codes for males and different unwritten feminine codes for girls. It is believed that boys are to act strong and hide their emotions. Hence, underlying these society beliefs, the girls and boys are trapped in a web that is difficult to escape and undermines their motivation to learning that is apparent during the developmental stages of childhood and adolescence of schooling (Gunzelmann, 2012). There was an apparent gender difference noted at academic levels; more female University graduates (55%) while more male graduated with Polytechnic diploma (52%) (STATS, 2014). Gender difference was seen in professions such as 61% of the teachers were females. At school level, difference at academic attainment has been studied on domain-specific subjects, showing differences in interaction at classroom level and ethnicity- based perceptions of educational aspirations for boys and girls.

In the domain-specific studies, students' positive attitudes toward school subjects such as Mathematics and Science decline as children get older, with greatest decline between Grade 6 to Grade 7. There seems to be a decrease in academic activities and an increase in non-academic activities during this phase of the students' schooling (Anderman & Maehr, 1994). Emotionally, girls seemed to show lower self-esteem across transition from elementary school to junior high school. Boys' and girls' motivation declines in parallel ways in Years 9 and 10. Girls seem to recover in Years 11 and 12 whereas boys' motivation does not recover (Martin, 2003). Girls seem to rate significantly higher than boys in their belief in the value of school, learning focus, planning, task/time management and persistence but are more anxious and less self-handicapping¹⁷ than boys. This observation was linked to teachers' effective interaction with boys' perceptions (Martin, 2006b). Thus, gender constructs of behaviours, attitudes and belief influence in education is held by students and teachers at classroom level.

How this plays out in classrooms is the fear of failure that generates failure-avoidance and self-handicapping behaviours. According to Nosek, et al., (2002), boys' fear of risk to their masculinity

¹⁷ Self-handicapping, a phenomenon in which student create obstacles that make failure more likely with attributional activities that are not diagnostic of their abilities especially if students are uncertain of a certain performance or as a protective mechanism in self-competence towards failure. In this research, self-handicapping is used interchangeably with self-sabotage.

could hinder their willingness to embrace new learning when they are either uncertain of success or unwilling to re-learn what they have previously been unsuccessful with. This supports an earlier study that showed both teacher and parents can hold gender stereotyped expectations for young children (Leung, 1990).

It therefore raises a number of interesting questions for me as a researcher. Would it be possible to target strategies to address the lack of specific facets of motivation due to gender differences while maintaining engagement, for example, in learning Mathematics? Can students be helped to reach their potential and discover a capacity for engagement and achievement that previously may not have been thought possible? However, evidence from TIMSS showed that both boys and girls in Singapore did equally well in Mathematics (TIMSS, 2014). Hence specificity in Mathematics is not gender specific in this group of 8th Graders (14 years old) Singapore students.

Interestingly, PIRLS' data from a study on change-of-achievement-over-time between 1991 and 2001 showed that girls scored on average 16 to 29 score-points higher than boys on reading (Postlethwaite, 2004, p. 78). Singapore girls have performed better than boys from the PSLE results between 2001-2011 (MOE, 2012a).

Researchers have argued that perhaps the girls use learning strategies such as “self-regulatory” learning approaches more often than boys, and this could optimise their learning contexts when faced with difficult tasks such as reading and writing subjects (Ablard & Lipschultz, 1998). So girls and boys seem to use different methods of learning in order to engage their academic interest. In addition, at classroom level if boys and girls respond differently to their teachers' emotional state that may contribute to their learning experience. It is probable that teachers' regulation on their own emotional understanding state is critical in creating a positive classroom that encourages effective instructional engagement for students and teachers (Meyer & Turner, 2006; Newton, 2014).

2.1.3. Ability and effort effects

Perceptions of ability and effort seem to contribute to children's learning in school. Dweck (2000) found that children seem to recognise the levels of differentiation of ability and effort. As a broad categorisation, they are:

- a) those with a fixed mind-set believe their successes are a result of their innate talent or being “smart”; and,
- b) those with a growth mind-set believe their successes are a result of their hard work.

The fixed mind-set group also believe that they are stuck with a fixed intelligence and if performance is equal, the lower efforts imply higher ability. The children with a growth mind-set believe that intelligence can be cultivated, and more learning equals becoming smarter (Dweck, 2000). There are different scenarios on how children interpret situations to explain their assessment of effort and ability:

- i) if effort or outcome is equivalent to ability, then people who tried harder are smarter;
 - ii) if effort is the cause of outcomes, then equal effort is expected of equal outcomes;
 - iii) if effort and ability partially is differentiated: if effort is not the only outcome, and ability relates to performance/achievement or when achievement is equal, lower effort implies higher ability.
- Thus, Dweck's children expressed different quantitative judgement of ability and effort (Dweck & Leggett, 1988).

In this case study research, the cohort under investigation are mostly 12-16 years old students at a stage when children associate academic attainment with greater attribution to high ability rather than high effort (Nicholls, 1989). When a student relates high ability to capacity, then feelings of incompetence are likely if future failure seems inevitable. In educational psychology, a student with low perceived ability is likely to have more psychological costs when more effort is needed to accomplish a goal.

According to Nicholls (1989), the notion of "ability" in the everyday world of human interactions in social circumstances is the construction of social power, a form of cultural capital that protects and nurtures, and offers social mobility. It defines a role in the process of exclusion when there is a lack of "ability", and "failure" limits the access to rewards and opportunities. In older children, when the concept of ability and effort is more differentiated, the input of more effort to accomplish a goal is perceived as incompetency to performance. Hence low perceived ability would therefore lead to more impaired performance and effort that is likely to have a higher psychological cost. The negative implications of ability as capacity could lead to low self-evaluation and consequences when student face the prospect of a failure that would indicate incompetence.

Yet there are always some tasks that one cannot do and this inability does not necessarily generate the feeling of incompetence. Hence the concept of ability as capacity in task attainment is meaningful especially when it is in comparison with others who could do it. In situations where students observe tasks that could be accomplished with lesser time/effort by their peers, these students would feel less competent. In which the case where failure is expected, these students would not try harder. In school, recognising this self-handicapping phenomenon would provide an

opportunity to intervene by changing the students' attribution of ability as capacity to emphasis on responsibility toward learning in the situation likening it to a change in behaviour.

The positive reinforcement of success and perseverance has been successful in training children on the alleviation of "learned helplessness". This phenomenon used in educational psychology studies refer to children's behaviour in learning. The perception of "hopelessness" is an observed presentation of withdrawal from an aversive event such as failure (Dweck, 1975). In a failure intervention, Dweck used an instructional training procedure to teach children to attribute failure due to insufficient effort. This had resulted in a consistent improvement afterwards. While the effort goal is internal and controllable, it is therefore worth promoting as an intervention procedure (Yeung, 2011).

The attribution to learned helplessness is described by Khor & Yip (1982) on students' attitude that account for their poor performance at studying a second language (a compulsory subject in Singapore secondary schools). Apparently, the dislike for the second language started (even) in Primary school. The researchers found that the perceived difficulty and the negative learning experiences compounded by the lack of parental support, lead the less academically inclined student to deem failure as not "controllable". Hence instead of exerting more effort as a result of psychological reactance to pass the language examination, students would stay unmotivated. Thus, avoid a situation that threaten his self-respect, assumed a "learned helplessness" state that lead to the eventual reality of failure.

From a cultural perspective, ability and effort are two distinct psychological constructs in academic achievement with Chinese students having higher perceptions of effort than the Australian students whose perception of ability predicted achievement outcome (Yeung & Yeung, 2008). Increasingly, effort has been emphasised in Western education, too (Dweck, 2008). Effort is internal and controllable, therefore it is self-manageable irrespective of cultural background. Because effort is controllable and ability is not, hence it is worth enhancing students' effort orientation in the classroom (Weiner, 2004).

2.2. Students' socioeconomic status and multicultural focus

2.2.1. Socioeconomic status (SES) and education

Education is intertwined with the economic systems of society. Having economic resources could mean the full availability of the educational opportunities. Schools have their selection criteria for

providing quality education, hence distribution of economic resources plays an important role in a student's access to a quality education and its determinant of life chances (Lynch & Lodge, 2002). Understanding the critical importance of family background in determining school achievement seems crucial as SES could disadvantage a student's education.

Two key sociological constructs, namely cultural capital and social capital¹⁸, are relevant to the parenting situation in Singapore. The cultural capital concept was formulated by Bourdieu (Bourdieu, 2002) who contended that family social position in a class society and its socio-cultural resources available at home could promote educational success. Influences include how parents invest in the educational system to improve children's opportunities. However, the mechanism by which the "habitus" described via appropriate "codes" perpetuates the reproduction of the structure between classes through intergenerational transmission of power and privileges (Robbins, 2000). How could the education system ameliorate this apparent disadvantage due the effects of SES on a student's education?

A student's SES or social hierarchy relates directly to the resources an individual or a family has at its disposal for everyday needs. The indicator components are parental income, parental education and occupational prestige (Sternberg & Williams, 2002, p. 194). Socioeconomic influence on students' achievement seems to matter more at the early years of schooling when the lower socioeconomic group starts schooling behind that of the higher socioeconomic group (Tan, et al., 2011, p. 223). Hence, school and teacher are important links in bridging the education deficit.

It seems logical that schools with optimal resources could make up for inadequacy of resources at home, hence the school culture and policy need to promote visible learning¹⁹. Schools could encourage parents from lower socioeconomic strata to learn the language of schooling and education to help their children to learn. However, teachers' judgements of non-cognitive student characteristics are powerful determinants of schooling success even when students' cognitive parameter is controlled. This has impacted upon parents' participation in their children's schooling with teachers but the difference lies in the ways parents promote and support their children's educational successes at home (Lareau & Weininger, 2008).

¹⁸ In Coleman (1988), financial capital refers to physical resources by the family; human capital refers to skills and capabilities of person that can be measured by their parents' educational level; social capital is defined as strength of the relationship between parents and children and used as a measure of social capital within the family that is accessible by the children. Social capital is used to explain differences in educational outcomes. Coleman's concept focuses on its effects in the creation of the human capital for the next generation. Emphasis is on improving social competence (prosocial skills in social setting) and social goals-to-peer influence.

¹⁹ According to Hattie (2009), teachers could use appropriate teaching strategies to impact positive learning.

Though the structure of a family (e.g. single or two-parent families, resident or non-resident fathers, divorced parents, adopted or non-adopted children) may affect students' learning, academic achievement is more closely linked to the socio-psychological environment and intellectual stimulation in the home. Hence, parental involvement and expectations are more powerful influences than family structure and SES for students' academic achievement (Khong, 2004).

On social capital, some parents could build on the strength of social relations based on the availability of the resources of others (Khong, 2004, pp. 22-28). Parents who use social capital can partially compensate, via informal networks, depending on parental interest and concern, the presence and quality of parent-child relationships, social relationship both in- and out-of-the-home. This interconnectedness could be harnessed for children's social and educational benefits. Compensation for disadvantaged children could be obtained within community support and by use of available resources such as school computers, libraries, and free or subsidised classes.

So far, the SES of students at home has been correlated to positive as well as negative educational outcomes (Knapp & Shields, 1990; Jordan & Plank, 1998). Where income is lacking, the educational structures can provide support for students to access relevant resources. This has to be in tandem with the level of parental involvement in their children's education.

According to Howse, et al., (2003) there is little evidence to state that children from economically disadvantaged homes are motivationally disadvantaged during the early years compared to their more advantaged peers. The implication for educators is to encourage young students to engage in strategies to enhance their learning and be motivated. This encouragement is based on the finding that there was no difference on child-and-teacher reported motivation levels among the children at-risk and children not-at-risk of dropping out of school. However, the at-risk children showed poorer abilities to regulate their task attention than the not-at-risk children. In addition, younger at-risk children's achievement scores were predicted by their levels of attention-regulation abilities. Hence to promote success at school, educators would encourage parents to be actively involved by participating in school educational programmes directly or indirectly. These attempts could help students internalise and regulate their social behaviour towards learning. In totality, disadvantaged students need support from parents, school environment and most important of all, the students themselves on exerting correct mental focus and effort to level up at learning.

2.2.2. Define engagement/disengagement

The term “engagement” refers to the ‘extent to which students identify with and value schooling outcomes, and participate in academic and non-academic school activities’ (Willms, 2003, p. 8).

Darby’s (2005) paper identifies five components for effective learner engagement sorted into two dimensions. Dimension 1 is the instructional dimension that consists of:

(1a) teaching for interest and motivation and (1b) teaching for understanding.

Dimension 2 is the relational dimension that consists of:

(2a) inclusive classroom that provides for the needs of all individuals, (2b) positive classroom environment that makes all learners feel safe and valued, and (2c) enthusiasm for learning (teacher and students).

In this case study, Dimension 2 is particularly relevant and it encompasses the research focus on students and teachers’ perceptions of students’ study. After the student is motivated, what would get him interested? Dewey (1913) explained interest in two constructs: identification and absorption. The self-initiated subject-matter of interest could be content-specific or instructional. What would hold a student’s interest that encouraged effort and support learning? Interest is multifaceted and could be situational when it is to ‘catch’ the students’ attention and ‘hold’ in learning where activities are meaningful and involved (Mitchell, 1993).

Educational engagement has been used synonymously with student involvement or student participation (Finn, 1993) that is associated with decrease in drop-out rate (Glanville & Wildhagen, 2007) and positive academic outcomes (Kuh, Cruce, Shoup & Kinzie, 2008). It is a multidimensional construct that refers to the quality of students’ connection or involvement in schooling: values, activities, goals, place (Darby, 2005). Active classroom participation is correlated with learning success, valuing of school and sense of belonging to school (Finn, 1993). Thus, the twin aspects of engagement: attitudes and behaviours. The former psychological element of what students think about school, about teachers and about themselves in the school environment can be measured as students’ “sense of belonging”. While the latter behavioural element refers to class attendance, paying attention and involvement in extra-curricular activities are measures of “participation” (Willms, 2003).

According to research, engagement can be defined in three ways (Fredricks, Blumenfeld & Paris, 2004):

- (a) Behavioural engagement draws on the idea of participation; it includes involvement in academic and social or extracurricular activities and is considered crucial for achieving positive academic outcomes and preventing dropping out.
- (b) Emotional engagement encompasses positive and negative reactions to teachers, classmates, academics, and school and is presumed to create ties to an institution and influence willingness to do work. The affective component pertaining to students' sense of belonging in school and acceptance of school values.
- (c) Cognitive engagement draws on the idea of investment: it incorporates thoughtfulness and willingness to exert effort necessary to comprehend complex ideas and master difficult skills.

Central to the three defined statements is investment between the student and the environment. Because engagement is a multidimensional concept, it may imply that there is a degree of qualitative difference in engagement within each dimension. The authors concluded that engagement is associated with positive academic outcomes, including achievement and persistence in school; and it is higher in classrooms where there are supportive teachers and peers, challenging and authentic tasks, opportunities for choice and sufficient classroom structure. The engagement concept is expandable, with proximal influences shaping students' academic retention, achievement and resilience (Skinner, Kindermann & Furrer, 2009).

Disengagement or disaffection is the opposite of engagement in the conceptualisation of behavioural and emotional participation. It is operationalised by descriptors such as passivity, lack of initiation and giving up, quite similar to helplessness or exclusion, lack of effort to learning (behavioural), mental withdrawal and pressured participation when students are expected to stay in school. Students' disruptive behaviour has been associated with impaired academic outcomes such as dropping out of school (Finn, 1993). Both engagement and disaffection behaviours (e.g. not doing homework, absenteeism) are observable and salient to both teachers and students (Finn & Zimmer, 2012). Being disengaged in class could mean failing to take advantage of constructive learning strategies or engaging in negative behaviours that impede learning such as learned helplessness. Mediating the engagement factors such as increasing support from peers, parents and teachers have been shown to improve task focus in learning (Kiuru, et al., 2014). Hence meeting the needs of students who have been disaffected with school could be a challenge for teachers because these students may underperform and leave school without adequate qualifications.

In situations where failure is repeatedly experienced, students could assumed the learned helplessness behaviour (Covington & Omelich, 1985). This behaviour explains why some students

who adopt the self-handicapping stance intentionally withhold their effort when they must confront a difficult task (Berglas & Jones, 1978). Others may create obstacles that make failure more likely for attributional benefits that enhances self-protection and self-enhancement (Tice, 1993).

This failure-accepting behaviour, or self-defeating behaviour, may create three deficits: (i) cognitive deficit on failure to learn or practise strategies in learning, (ii) emotional deficit of feeling of depression, and (iii) probably lower self-esteem as it has been shown to have ‘a pervasive and powerful impact on human cognition, motivation, emotion, and behaviour’ that is detrimental to psychological well-being of the person (Baumeister, 1993, p. 3).

While engagement refers to “visible manifestation” of motivation, it has been studied at four nested levels:

- (a) engagement in prosocial institutions that promote positive development, protect against risky behaviours and delinquency;
- (b) engagement in school activities that promotes academic graduation, protect absenteeism and dropout;
- (c) engagement in classroom promotes achievement and protect against failure; and
- (d) engagement in learning activities promote development of academic assets such as learning, resilience and coping (Skinner & Pitzer, 2012).

Here, the everyday resilience or coping focuses on what happens when students make mistakes, encounter difficulties and failures in school. Being engaged is an important component of academic resilience (Finn & Rock, 1997). PISA self-reported data collected on students’ attitudes and values represent a disposition towards schooling and life-long learning. It showed that literacy performance and student engagement (evidence of participation and sense of belonging) do not necessarily go hand-in-hand. In short, high performing students may not be engaged in classroom (OECD, 2003). However, PISA data did not measure other important goals for students’ engagement such as successful learning (the need for mastery), curiosity (the need for understanding), originality (the need for self-expression) and relationship and energy (the need for involvement with others) (Strong, Silver & Robinson, 1995). Nevertheless, success in learning is possible if students initiate high quality learning using various strategies if they are motivated, not anxious on learning and believe in their own capacities.

In summary, student engagement is behavioural manifestations that are observable. In addition,

cognitive distinctions in academic achievement are linked to the psychological or affective state of well-being (Lester, 2013). The concept of engagement is a multidimensional construct of students' behavioural and emotional involvement in academic activities such as efforts and persistence in classroom (Skinner & Kinderman, 2008). Learning is triadic reciprocal interactions among components of the student (self), environment and the behavioural variables impacting students' academic performance. Assessment on the interrelatedness of the three domains of behaviour, affective and cognitive on student engagement show students' perception on learning tasks to be more engaging if the tasks are measured by grades (Caulfield, 2010). Being engaged in classroom promotes academic achievement but the reverse may not be true because students could achieve success academically without being engaged.

2.2.3. Impact of culture on motivation and engagement

Western studies have shown that there are certain cultural factors underpinning educational motivation and engagement in schooling. These include self-evaluations of academic performance, school work, value of education, peers' influence and teacher-student relationship (Hufton, Elliott, & Illushin, 2002).

Of particular relevance are perceptions of ability and effort. In Hufton, et al., (2002), pupils from the USA (Kentucky), England (Sunderland) and Russia (St. Petersburg) thought that effort was more important than ability on general achievement in school. American and English students were more likely to see that effort as morally more superior than ability while Russian students thought being "book smart" was not esteemed by the former. But in all three countries students viewed ability as more performative than innate.

Attitudes on hard work were also more prevalent among the Russian students and were admired by peers. This contrasted with the American and English students who valued out-of-school social life with peers to homework. In addition, Russian students valued education and deemed being educated as something of an intrinsic worth and these were reinforced by parents at home.

In a similar comparison study, Chinese students attributed success to effort while the Western students deemed both effort and ability as required for performance (Salili & Hoosain, 2002). To many Chinese students, teachers and parents, intelligence itself can be improved by hard work instead of being innate or fixed (Zhang, Biggs & Watkins, 2010). High educational achievement has been noted in Asian Americans and is culturally linked to parental emphasis on academic grades and as a means of upward mobility socially for the minority group (Sue & Okazaki, 1990).

In Western educational psychology, achievement motivation is treated as highly individualistic and success is to overcome failure (Atkinson, 1964). In East Asian societies, success is interpreted in a collectivist framework that involve significant others, the family, peers and society (Salili & Hoosain, 2002). However, the impact of ethnicity as a variable affecting academic achievement was not included in the Asian-American study (in Sue & Okazaki, 1990).

The Singaporean educational outcomes are being contextualised among students. As defined, the practice of multi-racialism is 'the practice of cultural tolerance towards the various communities, the acceptance of differences in religious practices and customs and traditions of the different communities without discrimination for any particular community and to accord each community equality before the law and the equal opportunity for advancement' (Chan & Evers, 1972, p. 15). Therefore, it is implied that social mobility is possible through hard work alone (effort) and thus does not privilege any single ethnic community. So socially, some individuals would and should be rewarded more than others by virtue of their achievements and merits. This is in line with the nation's pride on meritocratic ideals that shape its educational system that (unfortunately) has resulted in the social differential of student according to ethnic groups that co-exist and share similar sets of values (Gopinathan, 2013, p. 116).

By international comparisons of educational standards, Singapore is placed as a nation of high academic achievers. A closer look at the educational performance within the country shows that not all students are high achieving. Locally, the Chinese students outperformed their Indian and Malay counterparts when all students attend the same free primary and secondary education in state-funded, standardised curriculum and ability streaming. However, this structurally built system that grants equal opportunity to access quality educational resources has puzzled educators because of the existence of gaps in educational outcomes among ethnic groups.

Researcher Rahim (1998) argued that Malay students' lack of parental guidance at home, lower socioeconomic factors together with parents with lower education are factors compounding the low achievements. The author further cited the unequal ethnic community support and being disadvantaged by the 'elitist and eugenics-oriented nature of the education system' (Rahim, 1998, p. 247). However, the latter statement is rebutted by another author who believed that 'children do differ in intelligence, but intelligence can be changed through sustained hard work...' and intelligence is 'not genetic...' (Willingham, 2009, pp. 132, 137). Recently, it seems that the structure of the Singapore education system could create disadvantages for this ethnic group (Zhang, 2014).

It is appropriate to mention here the importance of a multicultural approach to education. Banks and Banks (2004) proposed five dimensions of multicultural education:

- (a) content integration (using examples from different cultures),
- (b) knowledge construction process,
- (c) prejudice reduction (helping students to develop positive attitudes toward different ethnic groups),
- (d) equity pedagogy, and
- (e) empowering school culture and social structure (promote equality among the various ethnic groups).

In summary, academic achievements of students from the different ethnicities have been contextualised and studies in relation to the multicultural aspects in education. Hence this case study research data would be analysed according to the three major ethnicities: Chinese, Malay and Indian.

2.3. Interaction forces in learning

2.3.1. What is learning?

Learning is a social enterprise; children learn from interaction with peers, and during peer interactions they develop mutual decision-making that enable them to understand the consequences of their actions (Perret-Clermont & Jean-Marc, 2008). Cognitive development occurs in distinct stages with thought processes distinctly different for each stage. Learning is central in the discipline of education, practice of schooling, and it matters in curriculum, assessment and pedagogy. Broadly, Piagetian-based theories of learning involve the cognitive processes of acquiring skills or knowledge through study, experience, practice or reinforced practice and instruction. Direct experience can be constructed in a meaningful way for learning. If learning has taken place, there are resultant changes in neural function and consequently, a change in cognition resulting from experience influences behaviour. Some adjustable parameters may occur in the process of adaptation. The change in behaviour may be the result of the intervention of a teacher. The process of understanding is achieved via development of schema or patterns that form the basis of memories where previous experiences are easily assimilated.

New experiences must create new schema, integrating and blending with the old thereby establishing and accommodating a system of equilibrium that becomes the process of understanding and learning constituting behavioural and cognitive (mental level) activity (Hairon,

2006). The integrationist theory of learning in social context (behavioural) was described by Bandura (1990).

The study by Lave & Wenger (1991) on the Theory of Situated Cognition, knowledge is situated and is being developed in part as a product of the activity, context, and culture. Learning can occur without change in behaviour yet the consequences of behaviour play a role in learning that influences the processes of learning. That is because the mental component, cognition, is not visible. Different learning theorists argued that observable behaviours are functions of thought processes or learning as a result of environment as the primary agent. The cognitive theorists believe that learning is the result of the learner's mental processes. These explanations of behaviour with mental associations seem to persist as theorists define learning as a relatively permanent change in behaviour and mental associations due to experience. Change in the learning context is related to the process in progression and developmental growth, thus characterised learning as being involved and engaged in an experience.

In Vygotsky's (1978) framework of zone of proximal development, constructive positive learning can occur naturally without specific training. According to the social development theory, a social interaction precedes development; consciousness and cognition are the end products of socialization and social behaviour (Wentzel & Watkins, 2002). Vygotsky's 'zone of proximal development' (ZPD) identifies children working along with their teachers or more advanced students can learn from the 'more knowledgeable other' and achieve a level way beyond their current competence. The technique of collaborative learning allows the students to constantly communicate and negotiate with another group member, hence the socially shared learning processes provide meaning to the task. Fundamental to Vygotsky's theory is the notion of scaffolding through the ZPD by a significant other – teacher, student or parent.

In the classroom, Bruner (1977) used the terms "scaffolding" and "spiralling" to describe ways in which teachers can transfer responsibility for learning to their students via the ZPD. It emphasised that children's learning and development could be adjusted and supported accordingly to the function of task demand and communication status. Hence students could be encouraged to approach educational tasks with awareness of their abilities, learn self-regulatory strategies, work around difficulties such as poor learning conditions and be motivated to set higher goals with achievement outcomes.

Thus learning in a person-centred environment facilitates individualised co-operative (every learner is inter-dependent on the others to complete a task) and collaborative learning (all

learners work on the same task). It involves a continuum of individualised and social cognition (Tan, 2005, p. 2). Singapore's educational acclaim further stimulated schools to accommodate the country's aspirations towards excellence (Davie, 2016a). In achieving the learning outcomes and attributes desired for student character, some form of assessment is needed to know if learning has taken place. In general terms, learning is defined as acquisition of skills, attitude, knowledge and understanding (Newton, 2000).

In education, assessment is a systematic review of measurement in learning and is a key for educational reform. The main stages of assessment are: (a) formative assessment that refers to the assessment for learning; and (b) summative assessment that refers to assessment of learning. It is believed that information derived from formative assessment will lead to changes in the processes in the classroom that ensures learning will proceed in the right direction and will also support teaching (Black & Wiliam, 2003). This feedback type of assessment has been shown to benefit low attaining students representing the 'tail' of low educational achievement (Fuchs, et al., 1997). While the formative assessment exemplified the classroom learning process, it is the summative assessment that constitutes the Singapore national examinations. It is therefore natural that classroom assessments should facilitate daily learning for positive outcomes. When learning takes place, positive outcomes in examinations will be sustainable (Toh & Leong, 2014).

For the less academically inclined students, they may need more 'scaffolds', collaborative learning environment and may benefit from feedback type of assessment. This social and individualised activity is akin to the "Self" in educational psychology studies such as self-regulation, self-efficacy that are important predictors of metacognition in academic achievements. In this case study research, questions exploring the "student self" and learning will be included in a questionnaire featuring the student's perception on planning and management of school works.

2.3.2. Learning in a Singaporean home

Parental involvement in a child's education is pivotal to learning. Starting at kindergarten level, children whose parents volunteered in class showed improvement in reading achievement compared to a control group (DeCusati & Johnson, 2004). Academically, children's grades have been linked with positive effects of parents' involvement and been identified in a modified parent-oriented self-determinant theory (Ryan & Deci, 2000). When children internalised parents' goals and viewed them as personally theirs, children experienced positive control over their learning, resulting in the approval from the significant others such as parents. The closer the children feel to

parents, the more they are motivated in school by parent-oriented reasons (Pomerantz, Qin, Wang, & Chen, 2011). The Singaporean societal values could be linked to the Confucian values of filial piety and respect to parents who govern the academic attainment of their children (Chao, 1994). In other words, children are expected to do well academically because they love their parents.

Growing up in family with social position in a class society with socio-cultural elements or Bourdieu's cultural capital have been shown to promote educational success (Robbins, 2000). This phenomenon is visualised as the inter-connectedness of parents and school initiated by parents to seek participation in school and contributing to their children's success in school. In an apparent comparison, the working-class parents tend to leave it to the teachers' duty for their children's education. Such relayed responsibility is also prevalent in high percentage of "structurally-deficient" single parent families or nuclear families where both parents were dropouts of school. Amidst the challenging conditions that affect the children psychologically, lack of parental involvement is cited to be a source of demotivation on academic attainment in schools (Silbert & Silbert, 2009). Structural characteristics of students' two-parent families versus single-parent households, students' perceptive of classroom climate, positive teacher-student relationships and students' positive attitude toward school are significantly correlated with engagement and achievement in schools (Areepattamannil, Chiam, Lee, & Hong, 2015).

According to Grolnick, et al., (1997), parental involvement could be moderated by the socioeconomic of the family, personal characteristics of parents that can affect their confidence in volunteering, inadequate support due to limited resources, or both parents are working and have limited time to be involved in their child's schooling. However, if parents and child place a high value on education, it could offset the negative effects of the family's low socioeconomic situation because the family knows that a child's education is an asset in social mobility and would invest in their children's education to break the cycle of poverty (Ho & Willms, 1996).

In mediation of the nation-state, MOE advocates that "every school is a good school"²⁰ and so it does not matter to which school a child goes because he will achieve equally well. Yet, in the PIRLS reading study, a statistic known as "intra-class correlation" called 'rho' is used to describe the amount of variance (the test scores) among schools as a proportion of all variance (i.e. among and within schools). Among the countries that participated in international reading event, Singapore

²⁰ Speeches Archive, MOE, September 12, 2012. The four "Every" phrases of 'Working Together to Deliver the Best for our Children': Every Student, an Engaged Learner; Every School, a Good School; Every Teacher, a Caring Educator; Every Parent, a Supportive Partner (MOE, 2012b). It now has the 5th: Every Principal, an Inspiring Leader in Education.

has the largest rho. In Singapore, '59% of all variation was due to variation among schools' (Postlethwaite, 2004, p. 74). This statistic shows that there were large differences among schools on the test scores from each school, and it did make a difference in which school the student obtained his/her education. At the national level, Ministry continues to promote the "good school" expectations to mitigate on marketplace preference for certain schools (to parents).

Nevertheless, Singaporean parents would do their best to enrol children in highly sought-after schools with reputable academic track records by volunteering in school activities so as to be favoured to their child's enrolment. According to Khong (2004), parents are stressed by their children's examinations due to high schooling standard. Indifferent parents who neglect their children's academic achievement may have children with learning and behavioural problems. Warm, supportive parents have children who scored better than the education neglectful parents. Also, permissive mothering and uninvolved fathering often lead to delinquency. In the home, maternal involvement has been found to be the most consistent and highly correlated factors with achievement (Gottfried, 1984). Parents of high achieving children are anxious²¹ about maximising every opportunity for their children even in areas not related to school work (Quah, Sharpe, Lim, & Heng, 1997). Overall parental aspirations and expectations for children have the strongest relationship with children's academic achievement, a most likely aspiration when parents work in partnership with the school and their children (Hattie, 2009; Wei, 2012).

In such a meritocratic system, parents see education as positional good and strive to be competitive. Singapore families place heavy investment in tuition and those with greater resources will be at a greater advantage to build cultural capital and buy out-of-school education services. It was reported that families spent over a billion Singaporean Dollars on tuition (Tan, 2014). However, this apparent high investment in tuition did not account for the high performance of Singaporean students (Davie, 2016b). Nevertheless, education attainment is an overarching consortium of other factors as well. Perhaps, some of the effects could be explained by the multicultural home environment.

Studies have shown that ethnicity and cultural values affect how parents orientate their children's educational lives as well. Chinese parents place heavy emphasis on educational credentials that have potentials to obtain "good" jobs with high pays to afford material gains, a sign of

²¹ Here refers to a local common usage of the word "kiasu". According to the Oxford dictionary, a "kiasu" person refers to "one that is very anxious not to miss an opportunity". Used as an attitude by Singaporean parents who are anxious for their child to excel so as not to lose out in the highly competitive society where merits are dictated by the national examinations.

success and an upward mobility. Indian parents have high educational aspirations for their children, expect even loftier credentials such as lawyers or doctors and often disapprove of technical colleges (Kang, 2005, p. 29). Malay parents have high educational aspirations for their children to get a Diploma or a University degree. However, it is not to get them ahead in the academic race but so that with a diploma they would not be 'left behind' (ibid. p.34). To understand the perceived low qualifications is to look at their collective nurturing of cultivating a "complete person" with character traits to be a "good Malay" that are acceptable by the Malay community.

The different foci placed by the different ethnic parental groups seem to drive the behaviour of their children into seeking good grades for the Chinese and Indian students, whereas Malay parents are simply happy that their children stay in schools. The Chinese parents seem to reward their children for good grades by providing educational resources and technological enhancement to achieve academically. The Indian mothers, compared to the Malay and Chinese, have the advantage of English fluency and access to a greater variety of resources that ensure their children's successes. The Chinese parents seem to link preserving family "face"²² to educational success and this in itself motivate the children indirectly to higher educational aspirations. Chinese parents have equal treatment of males and females on expected educational aspirations. This differs in Malay parents who favour their sons over daughters to pursue higher education because the girls are expected to get married and start a family after graduating from school. The status of women in Malay community is that their role is to be a good wife and mother (Kang, 2006, p. 55).

In summary, a CS School student is influenced by his cultural background, school educational expectation, national aspiration of life-long learning and the ability to maximise the school resources for learning skills with technical competencies.

2.4. The CS School education: the structure, school leadership and class size

2.4.1. The structure

The school is where formal learning takes place. Its social system consists 'of a number of major variables and factors such as a school culture, school policy, politics, the formalised curriculum and

²² The concept of "face" is Chinese in origin, yet many languages have "face" terms that metaphorically mean "prestige; honour; reputation" (Ho, 1976). Face is lost, for example through an individual's action means that he has failed to meet requirements placed upon him by virtue of the social position he occupies. It is argued that face behaviour is universal and that face should be utilized as a construct of central importance in the social sciences.

course of study. Any of these factors may be the focus of initial school reform, but changes must take place in each of them to create and sustain an effective multicultural school environment' (Banks & Banks, 2004, p. 24). Schools have their own priorities and values. Most importantly, the school must provide educational resources for every pupil to have access to learning and opportunities to benefit from it. Hence the MOE advocates that "Every Student- an Engaged Learner"²³ as vital for social cohesion in addition to economic growth (MOE, 1997).

The CS School 2007-2009 data showed that about 90% of the students attained training levels that enabled them to obtain jobs in a workplace. The overall psychological state seems to improve as measured by Youth EQi: YV™ Inventory. Thus, about 40% were able to further their studies to obtain higher level technical education at ITE and GCE Level passes.

The set-up of the CS School for the less academically inclined students has been a successful "second chance" bridge to acquiring skills and knowledge, and an opportunity to obtain mainstream education. Leveraging on this success, a second specialised school was set up in 2009 (Teh, 2014, p. 79).

2.4.2. The curriculum

The word "curriculum" comes from the Latin word "currere", meaning a course to be run, "a race" or "the course of a race" (which in turn derives from the verb "currere" meaning "to run/to proceed"). Broadly a curriculum course runs the expectations for what the students should know and able to do at each grade and within each subject domain. It is developed with strategies to achieve a best balance of surface or overview of the subject matter. If academic tasks and activities are personally meaningful for the student, it would help students to develop learning strategies to learn the subject matter in depth instead of just focusing on outcomes.

A curriculum that is infused with appropriately challenging tasks and material, promoting perceptions of control and self-development, would allow students to make choices of engagement. Active programs that teach specific skills and deeper understanding would motivate students to pursue strategies that are planned specifically for learning (Urdan & Turner, 2005). To promote learning, the curriculum's levels of difficulty must match the students' capabilities and

²³ An example of engaged learning the framework of "PETALS" – the acronym for 5 dimensions of pedagogy, experience of learning, tone of environment, assessment, and learning content. MOE web-site: <https://officialtlm.files.wordpress.com/2008/11/petals-framework.pdf>

capacity to learn. Hence curriculum should neither be too easy or too difficult to understand because it would affect the engagement in classroom learning (Newton, 2014).

Character refers to the 'complex set of psychological characteristics that enable an individual to act as a moral agent' such as the desire to do the right thing (Berkowitz & Bier, 2004). The 40% of curriculum on character education is central to teaching traditional moral virtues of respect, compassion, responsibility, self-control and honesty. The CS School student is to develop social competencies such as sincerity and honesty in addition to personal mastery such as delayed gratification, build emotional resilience and being successful at workplace. Research on 'character strengths of hope, zest and leadership were substantially related to fewer internalising problems such as depression and anxiety disorders, whereas the strengths of persistence, honesty, prudence, and love were substantially related to fewer externalising problems such as aggression' (Park & Peterson, 2009, p. 71). Students are taught how to use these strengths to build confidence and to work on weaknesses or less-developed strengths as a convergence on academic achievement.

The other two blocks of the CS School curriculum are the Foundation Education (30%) and Vocational Education (30%) Programmes. These aim to prepare the students in articulating well and building workplace confidence with the teaching of literacy, numeracy and information-communication subjects.

School practices such as promoting students instead of retaining them for a grade have more positive effects on social and emotional adjustment, self-concept and attitude towards schooling (Roderick, 1995). Grade retention is problematic as it stigmatised the students in the eyes of their peers and teachers, hence retained students are more likely to drop out. Students assessed of learning in formative assessment would be advantageous to the less academically inclined the CS School students (Fuchs, et al., 1997), followed by summative on certification of skills (depending on the students' interest).

Other practice such as out-of-school curricular experiences offered outside school hours have shown low gains on academic outcomes. Even for structured after-school programs, overall effects are still negligible when compared to what effective teachers can attain in classroom using many other methods of instruction (Lauer, et al., 2006). However, some enrichment programs are considered to broaden the educational lives of students. Specific program such as mathematics and science are more beneficial than others.

Other activity such as organised community service has promoted experiential learning (active doing) and in the process this service engagement has taught character building in the student. The CS School is an 'experimental school' that promotes 'hands-on and experiential approach to learning, suited to students who learn better in non-traditional classroom settings...' and provides 'a wider range of vocational options to stimulate students' interests and open up their career choices'. Teachers are could re-do, re-teach curriculum to engage students' classroom learning by providing 'a safe and non-threatening environment ... for learning'. This impacted the Singapore education system on how to develop the 'school's culture, and how teachers relate to students and to the curriculum' (CS, 2016a)²⁴.

2.4.3. The school leadership

In the report "Towards Excellence in Schools" (MOE, 1987), the study team concluded that the quality of the headteacher can make a major difference to the schools. The Singapore Mentoring Model is a professional development for aspiring school headteachers. The practice has defined continuous workplace learning, a key development strategy on training of potential headteachers (Lim, 2005). Indeed, the headteacher role has been identified as a critical element in determining the success of school administration and its ultimate effects on student achievement (Richardson, Lane, & Flanigan, 1996). This further endorses the MOE's "Every Principal, an Inspiring Leader in Education".

The CS School was started by its first headteacher²⁵ 'known for turning around delinquent youths, academically-able students who were unable to fit into the mainstream schools' (CS, 2014).

The CS School's key success has been through various curricular reforms steered by teachers being 'the right people onboard'²⁶ (Sclafani, 2008). The current headteacher is passionate on providing 'right opportunities and environment' for the CS School students' education (CS, 2016a). This supports the continuous success at turning around the "no hoppers" students (CS, 2016b).

2.4.4. Class size

In Hattie's (2009) meta-analyses of factors affecting learning, the structural effect of a school contributes positively to student achievement. Secondary schools with a size range of 600-900 are correlated with positive academic achievement. Factors contributing positively include

²⁴ Reference available with researcher.

²⁵ 'We often tell the students that when they failed their uPE, they have failed in an exam, but this does not mean that they failed in life', a quote from founding principal (2012) for CS School setup.

²⁶ "...right people on the bus" (Collins, 2001).

effectiveness in teacher collaboration, team teaching and are relevant to the CS School's 800 students. Singaporean mainstream classroom size of about 40 students is defined as large while those below 20 are small (Blatchford & Catchpole, 2003). Despite the large class size, Singapore was first in the 2015 PISA score (Davie, 2016a). The contextual influence on teaching effectiveness and pupil learning behaviour by meta-analyses suggest that class size shows a systematically small effect on students' academic outcomes (Hattie, 2009). One suggested reason for this was that teachers were not retrained to work with smaller class size and used the same teaching strategies as for larger classes (Soh & Loo, 1993). This seems to explain that the at-risk academically weaker students studied as having 'nothing intrinsically or psychologically wrong with them, rather, they lack the skills or motivation to fulfil their academic potential' – a disadvantage to learning (Lim, Herdberg, & Tan, 2005, p. 168).

However, the direction has now moved 'beyond class size to focus on variables that are related to student achievement such as teacher work load, teacher stress and morale, instructional method, student behaviour and attitudes, content areas, student characteristics, grade level, classroom practices and teacher-student interaction' (Herdberg, Atputhasamy, Tan, & Lee, 2005, p. 30). It was shown that students 'increase attentiveness and enthusiasm' if working in groups of 4-6 students (Lim, Herdberg, & Tan, 2005, p. 170) creating an environment conducive towards learning.

Therefore, "attentiveness" is shown to contribute to learning. Though limited research has been done on attentiveness and small classes, researchers have argued that in smaller classes the effect of attentiveness in learning would be more pronounced due to more instructional contact when compare to larger classroom where noise levels could be problematic especially to those students at the back of the class (Blatchford & Catchpole, 2003, pp. 749-750). This means that lacks of contact and less attentiveness may equate to being the passive form of being disengaged from schoolwork.

In summary, factors such as school student population size and class size seem to be relevant factors for class engagement and successful academic outcomes for the less academically inclined students. In addition, MOE is focused on raising the quality of teachers and schools are given the autonomy of teachers' deployment that include reducing class size to meet students' needs (MOE, 2012c).

2.5. Education and the classroom

What is education? The term “education” probably derived from three latin words: ducere –‘to lead’, educare-‘to mould’ (into particular shape), and educere-‘to bring out’. These words embrace the process at individual and national level. It is aptly summarised by Peter Mortimore (2013) as: ‘Education is a process through which society transmits its accumulated values, knowledge, skills, attitudes and customs from one generation to another and influences how an individual thinks, feels and acts’ (Mortimore, 2013, p. 3).

The educational success of the Singapore education system is the underlying structure of pedagogical flexibility to cater to diverse abilities and at improving the quality of the teachers (McKinsey-Report, 2007). This strategy of reform of centralised curriculum and the unique centralised teacher training approach are noted for the Singapore students’ 2015 PISA achievement (Teng, 2016).

At classroom level, among the various factors that contribute positively to learning is student-teacher relationship, the teacher’s ability to control potential student behaviour, and disciplinary interventions to reach appropriate recognition (Marzano, Pickering, & Pollock, 2005). For example, in Invitational Learning, a self-concept approach to learning and teaching, it emphasised that the climate with-in classroom would be conducive for learning when learning is exciting, engaging and enduring (Purkey & Novak, 1996).

Apparently, teaching styles contribute to a proportion of student change in learning behaviour. The more effective teachers are clear on goals, aligning challenging curriculum with extra instructions to students when they need it, and good teaching matters more than anything else (Gollnick & Cinn, 2006, p. 129). This includes being sensitive to internal culture of class, ethnicity-sensitivity and gender awareness. Knowing that teacher-student relationship ranked the highest at influencing academic achievement (Hattie, 2009), a teacher’s enjoyment of teaching and perception on students’ motivation and engagement could be indicative of student learning. Would this be evident to students’ education at the CS School?

In addition, teachers’ values and beliefs can influence the type of structure they create in the classroom. Teachers’ responses through the years can enhance or threaten each student’s sense of self. These could influence their relationships and students’ structural position in the classroom that could lead to success or failure (Ames, 1992; Blankstein, 2010). Students’ performance can be

affected by their teachers' expectations, learning and teaching strategies, classroom organization and criteria for evaluation. The teacher has overwhelming influence of the learning environment within the classroom (Galloway, et al., 1998). The quality of teaching as perceived by the students is the teacher's clarity in articulating success criteria and achievements. A teacher's ability to respond to situational cues that automatically trigger teaching has been shown to be highly self-efficacious in teaching students to think, generally described as teaching moments or experience of "flow" (Csikszentmihaly, 1990). Central to a teacher's self-efficacy is the ability in the development of strategies for students to think (Gibbs, 1998) and use of specific design of teaching/learning activities aligned to curriculum objectives to motivate the students (Biggs, 1999).

One attribute of what makes a good teacher is how to get students to be engaged in class on content of curriculum with consequent development of thinking and reasoning. This brings us back to our earlier discussion about engagement (Darby, 2005). It is the ability to do this that differentiates teachers who are experienced and expert with teachers who are experienced and non-expert. It involves students being actively engaged in learning using multiple paths to problem solving and purposeful thinking. In a meta-study, students were found to evaluate the teacher's excellence in teaching accurately (Hattie, 2009, p. 35).

It follows then what seems to matter in education: the conceptions of teaching, assessment and having expectations that all students can progress, achievement for all is changeable, and progress for all is understood and articulated. So, teachers have to be open to experience, learn from errors, seek and apply feedback from students in order to foster effort, clarity, and engagement in classroom (Newton & Newton, 2001). Research that linked teaching quality to student learning outcome showed improvement during the first five years of teaching (Hanushek & Rivkin, 2006). Apparently, the curve flattens such that on average, a teacher with 20 years of experience is no better or worse than a teacher with 10 years of experience (Willingham, 2009).

So far in classrooms, the teacher is the key to students' learning and perception of learning. To continue to deliver consistent success and high-quality teaching, 'a highly successful education system or educational reforms, connectivity and trust-building between government, teacher education institutes, and the schools are vital. Diversity of the learners' cultural backgrounds and the context in which the teaching and learning' must being considered (Tan, Liu, & Low, 2012). Hence teachers are important to help students maximise their learning potential. Definitely, the key to education is not what the teacher does, but by what the student does as a result of what

the teacher does because the 'quality of education system cannot exceed the quality of its teachers' (McKinsey-Report, 2007). Perhaps, a 'good teacher is one who does not teach the subject but teaches students the subject' (Teng, 2016). In optimising human functioning, it is the teacher's role to 'model, scaffold, facilitate, innovate, create, and discover best and sustainable learning, cognitive, emotional and pedagogical strategies and skills' to journey with the students' learning paths (Tan, 2005, p. 13).

In educational research on motivation and engagement, the emphasis is on student understanding the lesson that subsequently influences student achievement (Newton, 2000). The achievement measurement on learning processes could be demonstrated behaviourally by appearing to be on the task though cognitively or mental perspective they may not be on the task (Peterson, Swing, Braveman, & Buss, 1982). Research findings suggest that lower ability students need more help to develop the habit of thinking and in asking for help when they cannot understand the part of the lesson. A well-structured school environment, encouraging teachers, teaching methodology could provide a more comfortable and conducive environment for learning (Tay-Koay, 1997).

Several substantial changes in the Singapore education system that centred on "engaged learning" have ensured the recognition of educational success at international level (TIMSS-PIRLS, 2014). One of the strategies is to boost academically weaker students via learner-centred and inquiry-based pedagogies by professional and caring teacher because 'teacher is the key' (Gopinathan & Sharpe, 2014). Teachers ensure that students reciprocate to engage learning by being self-directed that is defined by 'any increase in knowledge, skill, accomplishment, or personal development', and brought 'about by his or her own efforts using any method in any circumstances at any time' (Gibbons, 2002, p. 2).

In addition to the provision of structural capabilities of school curricula, good leadership direction, and smaller class, caring teachers form the back bone of students' learning. Hence, the CS School teachers would be focussing on improving their students' self-worth by helping them see the importance of character development that would redefine success academically. The ecological environment of learning is provided, but how does a student cope academically with his everyday life at the CS School? According to Martin & Marsh (2008), academic buoyancy is the students' capacity to successfully overcome setback and challenge that is typical of the ordinary course of everyday academic life. It may represent an important factor on the psycho-educational landscape assisting students who experience difficulties in school and schoolwork. A measurement of this dimension will lend understanding into students' learning behaviour.

Stories such as seeing the star²⁷ in every child with the CS School teachers who never gave up on their students, having transformed students' lives by giving them opportunities to learn; teachers used methods that helped students to understand lessons; helping children from deprived background to get an education – these all reflect positively on the CS School teachers (CS, 2015). It is a meaningful snapshot on the teachers' activities. Is this because of the teachers' enjoyment in teaching?

Besides lesson plans, learning aids and reflections, the teachers shared students' information, e.g. 'the problems they faced at home, misbehaviours in class, anything which they felt was vital' for the rest of the teaching fraternity to know, adopting "a whole-school approach"²⁸ a concept endorsed by MOE to develop the students who have failed in an examination (Heng, 2014). This descriptive expectation builds the culture of feel-good activities, positive school environmental displays that interact uniquely with students, teachers, administrators, parents, and everyone else at the CS School (CS, 2011). The system aims to bring out the best in every child (every child matters), recognise talents and provide holistic development to realise the full potential of every child and inculcate life-long learning.

2.6 Exploring theories on motivation and engagement in educational psychology

2.6.1. The less academically inclined student priorities

This study involved about 300 students who have failed uPE and enrolled to study at the CS School. The majority of students are from the lower socioeconomic rungs, have parents who have not completed high school and with low Mathematics scores at uPE. In general terms, the CS School has provided the environment and resources to motivate and engage students in learning.

In classrooms, students with knowledge and ability to regulate their emotions learn better as emotional competence contributes to students' cognitive abilities such paying attention to instructions, planning, and reading ability (Gardner, 2010). So, to be successful in achieving positive outcomes, the student has to have stable emotional self with attitude and engagement

²⁷ The CS School crest is the 5-pointed STAR, an iconic representation of the 5 values SHINE: "Sincerity, our way", "Honesty, our foundation", "Innovation, our leverage", "Network, our support" and "Excellence, our pursuit".

²⁸ A whole-school approach is cohesive, collective and collaborative action in and by a school community that has been strategically constructed to improve student learning, behaviour and wellbeing, and the conditions that support these. Education Department, Government of Western Australia (2009).

towards student's new learning (Newton, 2014). Emotional aptitude and feeling valued are opportunities in attaining vocational skills (Halliday, 1996).

Less academically inclined students who are struggling with poor academic performance demand a specific strategy that may teach them how to learn. These academically at-risk students could be "trapped" in a multitude of social pathologies. Some of such could be limited access to educational resources, language and cognition barrier, whose parents with less than high school education, have long leisure time with few activities and in contemporary poverty (Neuman, 2009).

In the pre-school environment, the child learns through socialisation with his immediate peers, family and environment (Burman, 2008). The mental state of readiness to learn could also be influenced by how the students feel emotionally at school (Newton, 2014). The students' disposition to learning will need positive attitudes about learning and a successful achievement on outcomes of schooling. The components of control and engagement in learning have accounted for a high percentage of the variance of behaviour toward successful learning (Hattie, 2009, p. 32). Contributing to learning behaviour (as posited by social learning theory) are family factors (such as parenting), values, social skills and choice of peers (Simon, Whitbeck, Conger, & Conger, 1992).

When at school, 'once children receive responsive and consistent caregiving in settings that are safe and simulating, they can make a substantial recovery from the devastations of poverty' (Neuman, 2009, p. 57). Children could form healthy relationships, become eager to learn, develop skills and acquire knowledge necessary to finish school and earn a productive income. School-based programme could shape student behaviour (Chapman, Buckley, Sheehan, & Shochet, 2013), while setting small achievable goals that if accomplished will strengthen self-confidence in coping with similar problems in the future.

For the less academically inclined student, learning starts with interaction of self in a new environment, amidst the changes in physical make-up (physical development), making new friends (social development) and processing information making meaning from experiences (cognitive development). The understanding of how children develop and learn could be explained by Piaget's four basic concepts of cognitive development:

- a) "schema" concept refers to cognitive structures that are both the category of knowledge as well the process of acquiring that knowledge,
- b) "assimilation" refers to the resulting attempt to organise experiences into meaningful information that is added into pre-existing schema,

c) “accommodation” refers to existing schemas might be altered or new schemas might be formed as a person learns new information and has new experiences.

d) “equilibration” is where the learner self-regulates a balance between assimilation and accommodation. It is the force that moves cognitive development along. The mental processes assumed that the environment e.g. classroom plays a significance role in fostering knowledge formation or construction (Beard, 1969).

In some settings when concepts are not familiar, from Piaget’s view of cognitive reasoning, the disequilibrium could be motivating as the learner seeks subsequent information to complete the structure. In addition, the learner constructs knowledge in social and cultural situation of proximate learning from peers or more experienced educators via scaffolding support in learning and problem-solving as described by Vygotsky (Burman, 2008). This collaborative learning is advantageous to peer-support learning for the weaker academic students.

In the first 2 years of the CS School schooling, teachers use surface learning to reward and recognise students’ academic achievements. Surface learning is perceived as passive knowledge acquisition characterised by rote learning with the aim of learning new information (Marton & Saljo, 1976). It is usually used by students who are ‘emotionally unstable and who suffered from low self-esteem (characterised by neuroticism) who would tend to avoid taking risk of making mistakes ... and feel more comfortable with performing learning tasks that require them to reproduce what they are taught ...’ (Zhang & Sternberg, 2005, p. 81).

This in line with the “factual knowledge must precede skill” approach (Willingham, 2009, p. 19). Students need to learn a range of study skills and employ these skills to all learning contexts regardless of content and level of difficulty. For the low-achieving students, research has shown that they use study strategies less frequently than their higher achieving counterparts. Increased frequency of strategies usage have been linked to positive performance on standardized achievement tests and completion of homework (Zimmerman, & Martinez-Pons, 2004).

Using Bloom’s Taxonomy, there are six categories in order of cumulative hierarchy of cognitive domain: Knowledge (Remember), Comprehension (Understand), Application (Apply), Analysis (Analyse), Evaluate (Synthesis) and Evaluate (Create). Each category is a prerequisite to mastery of the next complex one across spectrum of categories. The Taxonomy has been used to classify curricula objectives. The first category “Knowledge” represents the emphasis on objectives that requires recognition or recall of information (Krathwohl, 2002). It is recognised to classify the first

three categories “Knowledge, Comprehension and Application” as foundation thinking (RMIT, 2016) as equivalence to surface learning such as rote learning or memorising approach. Marton and Saljo (1976) identified two sets of students when they were asked to read an academic text. Students either adopted a deep-learning approach characterised by a focus on learning and underlying meaning or a surface learning characterised by a focus on learning materials that commit to memory. Deep learning is optimal to academic outcome (Watkins & Biggs, 1996). However, multi-national assessments in PISA, TIMSS and PIRLS (2015) show Asian students with learners’ surface rote learning style within a large class together and highly authoritarian teaching have outperformed Western students. This phenomenon has led researchers to a concept deemed as the "paradox of the Chinese learner" (Watkins & Biggs, 2001; Kember, 2016) on the perceived cultural difference on approach to learning. In addition, CS School teachers visited their students at home (when students were absent) and often spent time with students after class. This informal interaction allowed learning to be transmitted “passively” (Sit, 2013). These formal and informal interactions of the less academically inclined students are opportunities to learn and pass the assessment during the initial schooling years. It is an important pre-engagement to motivate them to participate in deep skill learning during the final 3rd and 4th years (CS, 2009).

The learning approach at the CS School encompasses policy, staff behaviour, teachers’ commitment, empowerment through an engaging curriculum, feedback on learning and assessment, teaching materials and supporting programmes to increase participation at learning as a whole-school approach tool. As the CS School students are from different schools, it requires national education to endorse visible interaction of different groups, enhancing desirable educational outcomes and achievable learning while promoting ethnic cohesiveness (MOE, 2016c). In addition, factors such as positive student attitude to mathematics, teacher confidence in student performance and the test language being spoken at home were associated with greater chances of academic success. High academic expectations and time spent on mathematics at home demonstrated a differential effect between disadvantaged and non-disadvantaged students in Singapore (Sandoval-Hernandez & Piotr, 2016).

Motivational factors such as building confidence best suited for the disadvantaged students were recommended to help raise the student attitudes or engagement with science because these students may not have the supportive household environment of the advantaged students whose confidence and other positive approaches to learning which are more effective (OECD, 2011a). Once a student is in control of his own learning, he would be able to make decisions about what topic to learn, have the freedom to define the pace for his own learning, and know how the

learning experiences could be evaluated (Pintrich & De Groot, 1990). This ability to be in control would incorporate planning on how he would be able to achieve his learning goal and enjoy school, leading to independence and self-reliance. This suggests that the CS School students would be able to demonstrate evidence of learning experience between year 1 and year 4 students based on behavioural changes that would result in self-directed learning, being in control, employ planning strategies and adopt the goal mastery. If this is so, what would be the cognitive components or factors (self-efficacy, valuing school, and mastery orientation) that could contribute to their motivation or engagement at CS School?

In totality, motivation is behavioural in nature. It concerns control on why people do things, with actions that arouse and expend energy on activities that are persistent, sustained and goal-related in multidimensional ways. The three psychological functions that serve to direct, energize, and regulate goal-directed activity are interaction of personal goals, emotional arousal processes and personal agency beliefs (Campbell, 2007). In addition, there is a positive relationship between academic achievement and motivational indices of choice of task (task management), effort (planning) and persistence.

Alternatively, poor academic performance means that the students are not motivated or energised, not emotionally connected and do not believe in self or are low in self-efficacy. Poor academic results have been linked to interference of emotions of stress, anxiety, anger and fear on learning (Hendershott, 2009). Emotional competency has been linked to learning and school related outcomes i.e. the emotion-cognition link has been well established (Newton, 2014). At the CS School, students' emotions are assessed at the start of first year, a.k.a. the entry-point. If teachers are aware of their students' emotional quotients score, they could leverage this knowledge to improve students' learning style. It is because emotion knowledge could positively adjust and adapt students' learning (Gardner, 2010). This case study will also investigate which of the maladaptive components (anxiety, failure avoidance, uncertain control, self-handicapping, disengagement) that are worrying for the CS School students.

2.6.2. Motivation and engagement dimension

In this case study research, selected motivation theories relevant to student academic success are presented. The multifaceted constructs involve interacting cognitive skills and learning processes for students to achieve academically (Pintrich & Schunk, 2002). The process starts with the student self who is moved to learn and understand motivation processes.

Some of the constructs underpinning self-theories in educational studies are: self-efficacy, self-worth, self-regulation, self-determination, self-construal. Each of these self-conceptions has overlapping areas of educational significance and is subjective in any measurement score. In this thesis, the multi-dimension self-conceptions will be broadly discussed by detailing the relationships to positive psychology behaviour in relation to motivation and engagement associated with academic outcomes (Gilman, Huebner, & Furlong, 2009).

2.6.2.1. Self-efficacy theory

Self-efficacy or self-belief is a judgement of one's capabilities to organise and execute courses to attain designated types of outcomes. It is important in motivation because it provides the impetus of positive beliefs on judgements of how well one can perform specific tasks with whatever skills one possesses. According to Bandura (1990) students learn self-efficacy in four different ways:

- (a) direct experience of what happened on past occasions;
- (b) vicarious experience of observing what happened to others and modifying one's behaviours based on consequence of others' actions;
- (c) learning from the social world on what is seen and learning from them; and
- (d) applying one's own reasoning, reflecting upon and deducing implications from it.

Bandura's self-efficacy theory advocates efficacy as the major determinant of activity choice, effort, persistence and goal setting. High personal academic expectations predict subsequent performance, course enrolment and occupational aspirations choice (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001). Apparently, a student with a history of failure may suffer from low self-efficacy. Therefore, it depends on the students' emotional self-reactions associated with success and failures to be successful on a given task (Pintrich & De Groot, 1990). Students with high self-efficacy predicts achievement over and above ability levels. Similarly, the highly efficacious teachers develop effective teaching strategies that place values on students' education (Gibbs, 1998).

As motivation processes involve energy utilisation, it requires personal responsibility to commit and persist on the tasks. It is about the learner's perception of learning and at the end of the process something new has happened to the learner. In general terms it is assumed that the mind is a malleable living thing that grows and adapts in response to the environment. Cognitive functioning occurs at various stages of a child's development and is dependent on the social and cultural environment and are embodied in various signs and symbols systems via concept of ZPD that highlight Vygotsky's assessment of a child's potential level in learning (Burman, 2008).

Supportive networks of adults and peers interact with the child to accomplish tasks with the aid of scaffolder learning, a process of providing learner with tools on higher level tasks, and gradually withdrawing assistance (scaffold) when students are capable to do more. Typically, when the mind encounters a problem, it tries to find possible solutions drawing on prior knowledge and cultural beliefs in an attempt to understand the situation. The process of learning can be linear and erratic. It happens both by design and chance as schools operate in a multiplicity of concepts in learning (Stoll, Fink, & Earl, 2003).

During the schooling years, some children stay on and learn well while others leave without completing the programmes. As a miniature community, the school offers opportunities for teachers and students to engage in active learning, build consensus and experience activities that are relevant to students' interest and needs. Hence through the networks of social relationships, the students will grow by learning in more effective, meaningful and satisfying ways to deal with their future lives. The students' previous experiences, new interactions with teachers and resulting learning would present new beliefs on their abilities that are predicted from their classroom experience.

In summary, learning is social and process is malleable through structure scaffolds, leading to self-beliefs on academic achievement.

2.6.2.2. Self-worth, self-esteem, self-concept and contingencies of self-worth

According to Covington's (1984) theory of achievement motivation measure of self-worth includes self-validation of ability in the form of approval, love and respect from others, and avoiding failures that cause rejection or disapproval as self-protective processes (Covington & Omelich, 1985). Success without applying effort is most valued as it indicates a reputation for brilliance, a positive self-definition for ability. The four main fundamentals of this model are (a) ability, (b) effort, (c) performance, and (d) self-worth.

In the classroom, the teachers emphasise effort as it is important for the students to learn because investment of effort would be rewarded accordingly. In contrast, teachers prefer ability in the prediction of future grades. Students face the dilemma of applying effort in the learning contexts and accommodating ability seen as competence in the competitive environment.

In self-worth theory, the self-perceptions of ability depend on the circumstances of failure, such as in situations where students expended high efforts yet failed. This triggers the feeling of incompetence coupled with emotions of shame and humiliation. If a student applies low effort, failure due to the low ability will avoid the destructive emotions. According to Covington's theory, in the situations where the teachers reward effort and reprimand students for not trying (amidst possible failure), students who choose not to learn protect themselves against any negative implications of putting in effort yet encountering failure.

However, failure-prone students used strategies to preserve self-worth when risking failure in order to survive in the conflicting classroom environment. Several protecting self-worth behaviours in classrooms such as not risking a wrong answer and being labelled stupid, procrastination as a camouflage in capability to succeed, being busy, setting unattainable goals that camouflage impending failure, being angry of not bridging a gap, and being anxious about appearing stupid are obstacles to learning (Covington, 1992).

Others set low goals so as to avoid failure and success becomes predictable. In the long run, success loses its intrinsic value associated with challenge and uncertainty. Students with chronic low aspirations become mediocre and success is defined by not losing. Given the burden of losing credibility in the preservation of self-worth, students rated their ability lower and lower as failures mounted. Increasingly, the students who anticipated failure elicit anxiety and feelings of helplessness. Thus failure-accepting students give up on high achievement and an assortment of other strategies of worth such as diligence, punctuality and hard work. This is observed less frequently in females than in males (Covington & Omelich, 1985).

As we explore the dynamics of classroom achievement from the self-worth perspectives, the implementation of strategies that would best motivate these students becomes important. These include programmes that will reverse "shame" affect and to better engage students are useful (Tangney & Dearing, 2002, pp. 186-188) in raising self-esteem of the students.

According to Coopersmith (1967), there are four dimensions to self-esteem: competence (academic ability), virtue (adherence to moral standards), power (ability to influence others), and social acceptance (the capacity to be accepted and receive affection from others). Self-esteem is a 'personal judgement of worthiness that is expressed in the attitudes the individual holds towards himself' (Coopersmith, 1967, p. 5).

Rather than taking the average of domain-specific self-esteem, Harter used an overall sense of self-worth or global self-esteem that is “content free” (Harter, 2012). Parents contribute to children’s high esteem by setting high standards for themselves and their children with encouragement to let them be independent at the same time. High esteem children accorded their academic successes to their own abilities but attribute their failure to external factors such as difficulty of task. However, students with low self-esteem believe that their successes are due to effort and their failures due to lack of ability (Crozier, 1997).

The significance of evaluation and feedback on low academic outcome could be detrimental if performance is due to abilities. Emotions associated with failure and anxiety are counter to productive thought that ‘has the potential to help someone meet the demands of a challenging world’ (Newton, 2014, p. 1).

According to Baumeister’s self-concept (1999) definition it describe affective components of the individual's belief about himself or herself. It includes the individual's attribution on who and what he or she feel about “self”. It has been studied as a hierarchical construct, with general self-concept at the apex and further differentiated academic self-concept and non-academic self-concept at the second level (Shavelson, Hubner, & Stanton, 1976). The academic self-concept factors refer to specific academic subjects and non-academic self-concept factors refer to affective components of social self, emotional self and physical self. Academic self-concept and self-esteem are associated with educational outcomes in Singaporean students (Khor, 1987). Khor’s study showed the usefulness of interventions using self-esteem enhancement programs to improve the academic self-concept in primary school children’s reading skills.

In contingencies of self-worth, people pursue what they believe need to be or do to have the worth as a person (Crocker & Knight, 2005). Costs associated in the pursuit of self-esteem could be detrimental to learning, relationships, autonomy, self-regulation, and mental and physical health. Such costs to learning are when self-esteem is contingent on a domain. Students adopt performance goals to succeed and avoid failure or disengage entirely from the endeavour. Performance goals entail stress and anxiety which could undermine learning whereas disengagement could lead to withdrawal from learning. Hence Crocker and Knight (2005) proposed that instead of encouragement to develop contingency of self-esteem, students could adopt goals by focusing on what they want to contribute, create or accomplish and what they need to learn or improve in themselves to do so.

In summary, the studies on self-worth, self-esteem and self-concept collectively indicate that

students go to great extremes to preserve the emotional self, so much so that they compromise their chances of academic success with excuses if they do not do well.

2.6.2.3. Self-regulatory theory

All learners use some form of regulatory processes to negotiate their learning tasks and take responsibilities for the outcomes of their efforts (Zimmerman & Martinez-Pons, 2004). However, the essence of self-regulation lies in the perception of choice and control, accessibility and adaptability (Boekaerts, 1999). Being motivated has its psychological impact on the perception of efforts needed to realise their goals or task difficulty – if effort remains constant, the acquisition of task is viewed as of low ability. As such, students may define future task as difficult and may be pessimistic on acquiring new skills and self-confidence. Therefore, the regulation of students' learning is an active process where self-directed learning switches from a teacher-centred learning approach to a student-centred one. This internalised process involves self-management (planning, monitoring, control) and regulation of cognition, motivation and behaviour to service individual's goals (Pintrich & Schunk, 2002; Zimmerman & Martinez-Pons, 2004).

Self-regulatory control is different from self-efficacy on learning because in this case, students have no previous reference to gauge their competency in a new subject, hence raising students' self-regulatory processes for learning has potential for educational intervention in motivating students to learn new processes. Employing strategies and activities that operationalise a learner's learning could increase cognitive engagement levels (Chong, 2006). High achieving students tend to employ more regulatory strategies than academically weaker ones who may need help in setting, monitoring and reviewing strategies on positive goals that are achievable and to keep them engaged and motivated on learning (Ee & Moore, 2004). Therefore, participation in non-productive strategy is a failure in regulatory control and could result in being disengaged from academic work.

2.6.2.4. Self-determination theory (SDT)

Self-determination theory (SDT) (Deci & Ryan, 1985) focuses on three innate needs: competence, relatedness and autonomy (or self-determination). The learner must experience competence in skills acquisition, be socially connected and able to make autonomous or self-initiating change. It refers to intrinsic motivation and learning behaviour on interest/choice that the learner makes without external influence and interference that provides the understanding behind the volitional behaviours.

The central concept of SDT is the self-determination continuum of qualitatively different types of motivation ranging from amotivation (not motivated), extrinsic to intrinsic motivation. There are four types of extrinsic motivation:

- (a) external regulation (where a task is attempted to satisfy an external demand,
- (b) introjected regulation (a task is done for ego enhancement or punishment avoidance),
- (c) identification (where a task is valued for itself; behaviour is driven by obligation or guilt), and
- (d) integrated regulation (the most autonomous kind of extrinsic motivation).

External regulations are fully assimilated in a person's self-evaluations and beliefs of their own personal needs. Internalisation and knowing these steps of extrinsic motivations show the quality of effort that the learner is investing. When motivation is sustained, it is internalised and the learner feel committed to value education, develop autonomous regulatory styles and are more likely to stay longer in school and to achieve as compared to the less self-determined types (Deci, Vallerand, Pelletier, & Ryan, 1991).

Residing within the SDT concept is amotivation, wherein an individual does not value activity, lacks contingency between actions and outcomes and lacks competence or perceives no purpose in engaging in the activity. SDT posits that internalisation is in an environment that support competence, relatedness and autonomy (Deci, et al., 1991). However, instead of the SDT continuum from amotivation to intrinsic motivation to extrinsic motivation, motivation may be dichotomous of extrinsic and intrinsic motivation where two different goals can co-exist at the same time (Lee, McInerney, Liem, & Ortiga, 2010).

The SDT competence concept refers to the desire of the individuals to interact proficiently or effectively with their environment allowing them to learn and develop. Relatedness is the feeling to others and to experience a sense of belonging in particular social contexts. Autonomy or self-determination is a volition to sustain self-initiation and self-regulation of one's own behaviour. It follows that an autonomy-supportive classroom climate would encourage autonomous motivation while controlling contexts diminish autonomous motivation through enhancing controlled motivation (Ryan & Deci, 2000). If the three needs are satisfied, the individual's motivation, growth and well-being are enhanced. In contrast, if the three needs are not supported, motivation, growth and well-being are diminished. A local study shows that self-determined behaviours such as enjoyment of the Project Work subject better predict skills learned (Wang, et al., 2011). Being autonomously motivated influences student engagement (Saeed & Zyngier, 2012). Less self-determined motivations were correlated to anxiety and maladaptive behaviours (Ryan & Connell, 1989).

Other researchers link SDT to the time perspective theory of goals-setting in educational contexts. This could be viewed in five temporal categories of (a) past-negative (individual view of past in a negative angle), (b) past-positive (individual experienced past in a positive light), (c) present-hedonistic (individual present enjoyment without taking into account of future goals), (d) present-fatalistic (individual's sense of helplessness and one's belief that life is fated and that no matter what one does, it doesn't change the future) and (e) future orientation denotes the individual's intention to plan and set goals that those goals will be fulfilled (Zimbardo & Boyd, 1999). The past-positive and future orientation predicts intrinsic motivation and present-fatalistic may play a substantial role in amotivation, an application in studying drop-outs (Zimbardo & Boyd, 2009).

In classroom structures where a teacher's authority is supportive in assigning self-determined action to students, students have developed intrinsic engagement towards learning (Ames, 1992). In this case study, planning and tasks management will be included as students self-directed actions to perform tasks successfully.

2.6.2.5. Expectancy-value theory

The expectancy-value theory predicts that the higher the expectancy that certain behaviour can secure specific outcomes, the higher the outcomes are valued, and the greater the motivation to perform the activity (Wigfield & Eccles, 2000). This expectancy-value theory built on Atkinson's (1964) expectancy-value theory that links performance, persistence, and task choice directly to beliefs. Getting students to assume responsibility and control of their learning process is in itself a task that the student needs to evaluate internally in terms of the learning goals; the perceived skills, ability and knowledge (competency) and contextual opportunity to exercise control on the choice. These combined competences and contingencies to commit to learning goals must be sustainable by effort in order to be motivated to attaining the goal. It is also linked to the students' perceptions of efficacy. A sort of calibration of efficacy beliefs is important to keep the students motivated. The expectancy-value theory is linked with task value beliefs defined in terms of four components:

- (a) Intrinsic value (individual enjoyment/subjective interest),
- (b) Attainment value (person importance in succeeding),
- (c) Utility value (perceived individual usefulness of engagement and achievement in certain domain, and
- (d) Cost (perceived negative consequences of engaging in a task e.g. performance anxiety, fear of failure, effort required, and the opportunity cost of choosing that option).

Both expectancy and value beliefs are highly domain-specific and multidimensional that can be grouped into: intrinsic factors such as attainment and intrinsic value, and extrinsic factors such as utility value and cost. Expectancy and value beliefs additively predict performance persistence and task choice. In an extension using a regression model, the multiplicative nature of expectancy and value beliefs could predict achievement-related outcomes (Turner, et al., 2002).

In academic setting of skills and knowledge acquisition, students need to set goals and standards for themselves. Do the CS School students' motivation ties their behavioural value to expected academic outcomes of success in schoolwork?

2.6.2.6. Achievement Goal Theory

In the original two-goal model, the mastery goal has been generally associated with positive cognitive, motivational and behavioural outcomes versus the maladaptive outcomes of the performance goal (Ames, 1992; Urdan & Turner, 2005). The mastery goal orientates the student toward learning and understanding, developing new skills and a focus on self-improvement; performance goal represents ability recognition, protecting self-worth and are competitive in nature (Kaplan & Maehr, 2007). Hence, performance goal orientation makes people more likely to give up after failure, whereas learning goal orientation encourages people to persist in problem-solving.

Later, there were three different types of goals: (a) target goal (task-specific level in social cognitive research), (b) general goal (content signified by individuals on why they were motivated to pursue the tasks), and (c) achievement goal (constructs achievement motivation and behaviour) (Pintrich, 2000b). With the 2x2 achievement goal framework, the approach-avoidance perspectives were formulated: mastery-approach, mastery-avoidance, performance-approach and performance-avoidance goals. Mastery-approach goal refers to the development of competence to task mastery or learning goal and mastery-avoidance refers to regulatory failure, disorganised study with anticipated test anxiety but more positive than performance-avoidance goal. Performance-approach goal refers to performance on achieving higher than others (competitive) and performance-avoidance goal refers to students avoiding being seen as of low ability, appearing stupid, and displaying vulnerability (Dweck, 2000; Elliot & McGregor, 2001).

The multiple goals constitute the multiple paths to learning and achievement in multiple contexts. Self-regulated strategies of self-monitoring, control and task management involve the component of time needed to master a task. As some students are more knowledgeable in applying the

different strategies, they reach the goals intentionally and consciously and are aware of linking behaviour to goal mastery. According to Ames (1992), classroom structures (strategies and principles) could be employed to enhance students' adoption of mastery-goal orientation (e.g. higher achievement, more time on task) and be written into the curriculum. Within the mastery orientation, the focus is on effort and belief in one's efficacy in an approach to engagement.

As such, high-achieving students scored higher on task and ego (performance) orientations and lower on work avoidance than lower-achieving students. In an achievement-oriented educational environment, it would be of advantage for students to use self-regulatory strategies to generate effort in learning and for teachers to create opportunities for students to generate positive feelings about their efficacies and maximise their potential learning outcomes (Urduan & Schoenfelder, 2006).

In summary, a variety of terms are being used to characterise the different types of academic goals. Performance goals are also referred to as ability goals, ego-involved goals or normative goals (because students want to compare favourably with others) or as validation-seeking goal (Dykman, 1998). Mastery goals and task goals are also referred to as learning goals seem to generate intrinsic motivation (Dweck, 2000, p. 19). Whichever the goals, it is believed that 'self-driven students enjoy, value, feel competent, and put in more effort in school' (Wang, et al., 2017). Consequently, is learning focus evident in the adaptable cognitive component of the CS School education?

2.6.2.7 Social motivation

According to Ronnel and McInerney (2016), there are four types of social goals: (a) social affiliation (wanting to be with friends and enhance interpersonal belongingness in school), (b) social approval (wanting to get praise and approval from parents and teachers), (c) social concerns (wanting to help others in school) and (d) social status goal (wanting to obtain social status and/or power in school). Of the four goals, social status goal and social concern goals were positively associated with deep and achieving learning strategies (King & McInerney, 2016).

Other researchers described the students' pursuit of academic achievement in terms of societal recognition: vertical goals that are constructed upon social expectations of significant others (parents and teachers), and non-vertical goals constructed upon sources (personal choice such as peer recognition) of lower social expectations (Fwu, Wang, Chen, & Wei, 2016). Embedded in Fwu's study is the moral value of effort-making and fulfilling one's obligation to oneself and significant others in success situations academically.

The self-construal theory (Markus & Kitayama, 1991) is described in two terms: independence refers to relationship between the individual self; and interdependence refers to relationship in the social and cultural setting. It is contrasted with the Western independence self which refers to the autonomous entity and the Eastern interdependence that involves the self being intertwined within the milieu. Later, researchers added a third term: relational-interdependent self-construal is understood as the ways that people define close, dyadic relationships and social motivation (Cross, Bacon, & Morris, 2000).

In a local study on self-construal in Mathematics achievement, interdependent self-construal predicts positively the mastery-approach and mastery-avoidance goals that have an indirect total effect on maths anxiety (Luo, et al., 2014). However, overall self-construal was not associated with maths achievement.

In a study by Goetz and Dweck (1980), children's helplessness behaviours were related to goal-directed behaviours, associated with personal incompetence and ability when faced with social difficulties. In social situations, children with a learning goal focus displayed more mastery-approach when they experienced social rejection as compared to children with a performance-goal focus. These results parallel those found in achievement situations.

During early school adaptation, students with social ability to make friends develop better school perception and is associated with academic studying and gains in school achievement (Ladd, 1990). Having peer groups interactions of close friends of similar age or in same class positively influence achievement that continued throughout the academic period (Ryan, 2001). Hence intervention at an early age by promoting positive social behaviour may prevent students from dropping out of school at later age by mitigating the disengagement, thus advocating the re-engagement of learning (Alexander, Entwisle, & Horsey, 1997).

Some students achieve learning success via help-seeking ability and this perception of social competence fuels academic achievement because help-seeking is both a learning strategy and social interaction with others (Ryan & Pintrich, 1997). Broadly, ability to socialise has been associated with goal attainment 'accomplished as consequences of transaction with social environment' (Ford, et al., 1989). These social outcomes may be the results of motivational and contextual processes. School engagement has been observed in students whose ability to manage emotion-related self-regulation and maintain high-quality relationships with peers and teachers (Eisenberg, Valiente & Eggum, 2010). However, economically disadvantaged children exhibited

low levels of emotion knowledge at self-directed learning attempts and it could predict social problems and social withdrawal later in school (Schultz, et al., 2001). Low-achievers who seek low-achieving peer groups become less motivated over time (Kindermann & Skinner, 2009). As such, early intervention of preschool disadvantaged children could derive social benefits (Heckman, et al., 2010). Positive peer influences and collaborative learning positively enable students' intellectual and academic performance (Wentzel & Watkins, 2002).

Researcher Chong (2006) wrote that the three processes for effective social self-regulatory and metacognitive strategies are:

- (a) goal setting in responsible decision-making, such as type of social strategies in friendship-conflict situation relating to classroom grades,
- (b) constructive problem-solving and rational problem-solving, leading to exercise of emotional and behavioural control that have been linked to higher students' grades, and
- (c) self-control or self-restraint skills representing affective functioning on handling conflict situations that are linked to successful academic outcomes such as grade promotion or retention (Chong, 2006, pp. 31-38).

In summary, the social regulatory processes associated with motivation include the social circles of peers and significant others. The circumstances leading to academic functioning are based on qualitative assessments and inferences. Skills in control or restraint of emotions are contributory to successful learning outcomes. Knowing the emotional status of the failing students would be advantageous in motivation and engagement in an educational study.

2.6.3. Disengagement dimension

2.6.3.1. Test anxiety

Test anxiety is considered to possess two primary factors: worry (cognitive concern about one's performance) and emotionality (autonomic reactions to the test situation), with worry being more negatively related to academic performance than emotionality (Hembree, 1988). Anxiety interferes with learning-testing cycle (preparation, performance and reflection phases) resulting in a negative impact on students' test perceptions and behaviours (Cassady, 2004). Students with high-cognitive test anxiety are prone to low study skills, higher degrees of emotionality and helplessness attributions and overall lower performance when compared to their counterparts.

Singaporean parents are pushing their children to attain higher academic grades. When a child's performance does not correspond to a parent's unrealistic expectations, those parents communicate negative messages about their child's performance in a test situation that could result in test anxiety (Sapp, 1999). The consequences of anxiety include avoidance of courses and inability to achieve where test anxiety had greater debilitating effects than general anxiety. An inverse reciprocal relationship between test anxiety and academic performance was also noted (Foong, 1987). It relates inversely to students' self-esteem and directly to their fears of negative evaluation, defensiveness, and other forms of anxiety. Reducing test anxiety in classroom could improve learning and subsequent academic results (Lee, 2003). Employing management techniques could reduce test anxiety (Teo, 2008). Also, parents could help a child by providing emotional support to neutralise test anxiety effects – a parenting practice that could increase the probability of academic success – and by seeking help professionally (Lo, 2013).

In fact, test anxiety is experienced by students as early as Grade 3 and females exhibited higher test anxiety than males, although this does not appear to translate to performance. High test anxiety students hold themselves in lower esteem than do low test anxiety students. For the less academically inclined students, it would be helpful to know if studying at the CS School has reduced their anxiety situation to positive learning.

2.6.3.2. Control Theory and Attribution Theory

The locus of control concept originated in social learning theory of personality (Rotter, 1954) and it is well-established in the psychology of learning. The development of “personality” in control could be partly constructed over time in personality-social-cognitive variables where people's interpretations and expectancies of situations, events, and goals are found to mediate and regulate their behaviour (Mischel, 1973). This social-cognitive approach to learning ties emotions to cognitive processes and creates meaning systems for themselves.

Attribution theory is a collection of ideas on when and how people form causal inferences. It examines how individuals combine and use information to reach causal judgements. It was developed over time by Fritz Heider (1958) who first studied the reasons for people's behaviour and how the behaviour is linked to perception of causal control to self (internal) or to environment (external). Later, Weiner's (1992) theoretical framework of Attribution Theory was been used to understand the milieu of emotions linking them to causal dimensions of observed behaviours on success and failure in students. Dimensions of causality suggest that students attribute their success or failure to their personal characteristics on their perceived educational achievement.

The four general categories that affect attributions are luck, ability, effort and the difficulty level of the task itself. They are classified into three causal dimensions:

- (a) Locus of control (internal, external) is associated with changes in self-esteem and other affects,
- (b) Stability (stable, unstable) is associated with changes in expectations and performance, and
- (c) Controllability (controllable, uncontrollable) is associated with social affect (e.g. guilt, anger, pity and gratitude) and behaviour (e.g. decisions to intervene in one's own or another plight) to explain achievement behaviour (e.g. causes one can control such as skills versus causes one cannot control such as luck, others' actions, etc.)

In education, high achievers approach tasks relating to success because they believe success is due to high ability and effort, and attribute failure to bad luck (i.e. not due to their fault). To them, failure does not affect their self-esteem. Low achievers would avoid success-related tasks because they doubt their ability and may assume success is related to luck or other factors beyond their control. Students with learned optimism see failure as being attributed to more variable factors such as luck or effort making them more confident about future successes than failure in term of more stable factor such as task difficulty or ability (Seligman, Reivich, Jaycox, & Gillham, 1995).

The expectancies of future success based on students' self-perceptions of ability, feelings of competence and positive evaluations would be useful to understand how the attribution formulations affect the students' classroom motivation to learning. Students may also engage in negative learning behaviour such as procrastination, making excuses, avoid challenging tasks and not trying in an attempt to avoid negative ability attributions for tasks that they are not confident they can perform (Covington & Omelich, 1985). Students with entity theory on ability would adopt such helpless activities (Dweck, 1975).

The feedback of a successful intervention could be used to understand attributional origins used by the students who have failed the test. Therefore, implementing strategies to alleviate the attributional patterns of the students would promote beliefs on learning success. Knowing this, a CS School student learns to be responsible for academic attainment by learning relevant and useful skills for life-long employment.

2.6.3.3. Failure-avoidance goal

From the multiple goals orientation, performance goal is seen as positive for high achieving students while for lower academic students the approach is to avoid failure goals that could be seen as low ability or appearing stupid (Elliott & Hufton, 2003). This component of failure avoidance and anxiety are maladaptive/impeding constructs in academic setting. Such behavioural strategies are probably adopted by the less academically inclined students by way of protecting self in self-worth theories (Atkinson J., 1957; Covington M. V., 1992). This case study finding would inform the CS School on possible educational intervention to decrease this maladaptive aspect of motivation and engagement dimension.

2.6.3.4. Learned helplessness

In Dweck's (1986) implicit theories of self, the entity-theorists believe intelligence is a fixed trait and tends to display maladaptive pattern that hamper in acquisition/display of cognitive skills when they meet obstacles whereas incremental theorists believe intelligence is a malleable quality that tends to display adaptive patterns that seem to have their performance facilitated by the increased challenge. The maladaptive ("helpless") pattern is characterised by challenge avoidance and low persistence in the face of difficulty. Children displaying this pattern tend to show evidence of negative affect (such as anxiety) and negative self-cognitions.

The phenomenon of learned helplessness is characterised by the 'perceived incompetency along with certainty about such perceptions that causes the anxiety, despair, and pessimism about success' (Covington & Omelich, 1985, p. 448). When the student discovers the perceived loss of control, he would attempt to regain control and feelings of helplessness in a number of ways including reactance, a motivational choice to restore control behaviour (Miron & Brehm, 2006). If the expectations of control are weak or loss-of-control is experienced repeatedly, then the situation becomes a learned helplessness state. These self-defeating behaviours on lack of motivation could lead to disengagement, a cognitive deficit to future learning and an emotion deficit to depression.

Timely intervention could improve the students' perception of helplessness to achievement in learning (Dweck, 1975). Perhaps a remedial intervention would be beneficial to change students' belief of "learned helplessness" to "hopefulness" (Khor & Yip, 1982). Will there be evidence of opportunity to engage the students because students may physically be in attendance but are disengaged by their school experience? This awareness that schools may 'fail to retain

students because they never really engage them in the first place' (Hargreaves, Earl, & Ryan, 1996, p. 80) is contextualised in microsystem of students' face-to-face interactions with peers and teachers during their schooling duration (Bronfenbrenner, 1994).

2.7. Teachers' perception on students' learning

How do teachers' perceptions of students' motivation and engagement correlate with students' assessment in learning in classroom? An earlier study identified that teachers' expectations or "self-fulfilling prophecy" have a substantial effect on students' scholastic performance (Rosenthal & Jacobson, 1963). In ability-grouping, children placed in higher ranked instructional groups learned more and received higher grades than children in the lower ranked groups. Teachers' differentiated instruction affects the students in ability-group placements. Similarly, parents' perceptions of students' competencies because of the high ability placement. This ability placement was created for the study and it did not reflect the students' initial skills (Pallas, Entwisle, Alexander, & Stluka, 1994). Hence, the 'belief system of teachers heavily influenced their students' possibilities of success (Blankstein, 2010, p. 33). The way teachers teach could reflect their beliefs and are correlated to students' intrinsic motivations and the goals they set (Wang, et al., 2017). There is accumulating evidence that in teacher-student interactions or classroom social processes 'characterized by warm, respectful, and emotionally supportive relationships, students perform better academically' because the students are more engaged and enthusiastic about learning (Reyes, et al., 2012, p. 710). The influence of emotional components of learning and motivation when at-risk learner perceived their teachers as supportive have been beneficial to higher achievement attainment (Hughes, et al., 2012).

According to the self-determination theory, satisfaction of three psychological needs – autonomy, competence and relatedness are needed to enhance students' well-being and help them achieve learning outcomes. Providing support to students' behaviour in class is important because low-academic-level students are at risk of exhibiting disruptive behaviours (Klem & Connell, 2004).

In a Singaporean study by Caleon, et al., (2016), the "Normal" stream students who had lower academic results than the mainstream track students were considered as academically at-risk. Teacher autonomy and competence support along with student-teacher trust were predictors of student engagement in dimensions of students' behavioural, cognitive and emotional factors. However, teacher autonomy (e.g. constructive feedback, clear instructions and expectations, ability-suited tasks and teaching strategies) is a stronger predictor of academic engagement for

the at-risk students. Emotionally, the at-risk students need more assurance not to be “judged negatively” (ibid. p.534).

At times, it is possible for teachers to perceive student disengagement wrongly versus students’ actual feelings of affection for schooling. Students have reported to be more behaviourally engaged than teachers judged them to be (Skinner, Kindermann & Furrer, 2009). However, the construct of students’ school engagement may be difficult to determine due to complex interaction of diverse factors (Appleton & Lawrenz, 2011). As teachers are no longer the sole regulators of students’ learning, students’ engagement could mean valuing of school, attendance, homework completion as desired by school (Finn, 1993). These behavioural components could also include variables such as concentration, persistence of task and paying attention in school. Learning outcomes have been linked to quality cognitive energy spent on activity-based assignments that are measurable during the course. As such, it could be used as a tool to track student engagement and identify successful learning patterns (Henrie et.al., 2015).

From the socio-cognitive approaches to emotion, teacher enjoyment and student enjoyment within classrooms are positively linked and teachers’ enthusiasm mediates relationship between teacher and student enjoyment (Frenzel, et al., 2009). Teacher enjoyment is significant and it is like a ‘confirmation of good work’ (Bredmar, 2013). Teachers’ experiences of joy are intertwined with their experiences of flow and control. If enjoyment is absent, teachers say they lack the strength and energy to do the daily work (ibid. pp.13). At the CS School, teachers are selected and trained to teach less academically inclined students and manage classes with awareness of students’ emotional moods. Teachers’ self-report questionnaire on their perceptions of students’ motivation and engagement and Teachers’ enjoyment of teaching questionnaire would add knowledge to students’ positive learning.

2.8. Academic Buoyancy/Coping

The teachers’ support and the structural curricula adaptations are some of the positive operational actions to encourage this cohort of less academically inclined students who have been stigmatised due to examination failure to bounce back and cope with everyday school life. A survey on Academic Buoyancy on students studying at the CS School could inform us if these students learned to cope with everyday problems. From the low attrition rate and high number of students who graduated with skill-certificates, have the graduating students recovered from their bout(s) of failure to deal with their daily school lives?

Martin and Marsh (2008) defined “academic buoyancy” as ‘students' ability to deal successfully with academic setbacks and challenges that are typical of the ordinary course of school life (e.g., poor grades, competing deadlines, exam pressure, difficult schoolwork).’ They cited that their Academic Buoyancy instrument identified students with poor grades, experienced isolated patches of poor performance and daily stress that threatened their confidence. These descriptors fit the daily resilience as opposed to the chronic cases of academic resilience (Martin & Marsh, 2006). Resilience is understood as a positive adaptation in difficult personal, families or environmental circumstances. In contrast to everyday coping, resilience setbacks are so extreme that these would impair the person’s cognitive or functional abilities (Masten & Obradovic, 2006). Hence the resilience in this study refers to the reactive approach to coping by students who have failed an academic assessment named uPE.

The Academic Buoyancy instrument postulated that the construct is built on strength and emphasised on the proactive rather than reactive approaches to setback/challenge would be able to delineate if students are able to cope after failure of an examination. It is expected that the individual and school dimensions would provide strong measures underlying academic buoyancy components. In applying the 4-item scale of Academic Buoyancy across two-timed points to freshmen (entry-point) and graduating students (exit-point), research findings would identify the proportion of students with positive psychology factors and able to bounce back within the stipulated period of CS School schooling.

2.9. Summary of theories

Central to motivation and engagement are three competency standards that are used in a student’s evaluation of self: absolute (the requirements of the task itself), intrapersonal (one’s own past attainment or maximum potential attainment), and normative (the performance of others) (Elliot & McGregor, 2001, p. 501). The absolute and intrapersonal standards are grouped together because of its similar evaluative outcome. This case study would explore why are students are energised to be efficacious of future tasks, self-determined and intrinsically focussed, confident of learning goal, willing to invest in time to ensure academic success, acquire self-regulatory skills in planning and monitoring to persist academically.

When students do not feel competent, they adopt self-defeating behaviours of learned helplessness that could be attributional in nature, assume self-sabotage/self-handicapping activities that would reduce their success academically, accept performance avoidance goal and

becoming non-participatory in class that eventually leads to disengagement. These amotivation behaviours are emotional deficits to preserve self-worth, self-esteem and self-concept.

Adding to students' educational success are students' prior experiences such as home cultural and social capital-linked resources, parental socio-psychological stimulation and expectations, stereotyped effects such as gender-generated academic alignment, ethnicity-associated low academic success, peer support and safety in fulfilling basic physiological needs. Some of these perceived experiential factors could present as hindrances to educational pursuits and there have been suggested remediate strategies to de-emphasise on the evaluative threats (Singletary, Ruggs, & Hebl, 2009).

A summary of the educational psychology theories, activities and behavioural-cognitive variables that relevant in this thesis are tabulated (Table 2). These variables will form the research measurements on student motivation and engagement at learning. The array of behavioural-cognitive variables is sorted into positive and negative psychological constructs: positive constructs are self-belief (or self-efficacy), learning focus (or mastery orientation), valuing school, persistence, planning and task management and negative constructs are anxiety, failure avoidance, uncertain control, self-sabotage (or self-handicapping) and disengagement (Table 3).

Measurements of the positive constructs that are adaptive to learning and negative constructs that are maladaptive to learning with behavioural and cognitive variables will answer research question: To what extent are cognitive behavioural changes used to negotiate environmental demands for academic engagement after three to four years of the CS School education? The next chapter describe the use of MES-HS instrument and academic buoyancy questionnaire that were used in this case study.

Table 2: A summary of research studies, its activities and behavioural-cognitive variables

Research studies	Activities	Behavioural-cognitive variables
Engagement studies (Fredricks et al., 2003 ; Finn & Zimmer, 2012)	Classroom management, gender effect, teacher ability, quality programmes, beliefs, curriculum, peer interaction, authentic learning	Valuing school (“belonging”), learning focus, disengagement.
Self-efficacy theory (Bandura, 1990)	Goal choice, effort, persistence and goal setting	Self-belief, persistence, planning, task management.
Self-worth theory, (Covington, 1984; Covington & Omelich, 1985; Covington, 1992), self-esteem (Coopersmith, 1967), self-concept (Khor, 1987; Liu, Wang, & Parkins, 2005)	Goal choices, self-evaluation (competence), effort, emotions (vulnerability), virtue, influence power, social acceptance, self-esteem, self-concept, engagement	Failure avoidance, self-sabotage/self-handicapping, learned helplessness, test anxiety, disengagement.
Self-regulatory theory (Zimmerman, & Martinez-Pons, 2004)	Self-management (planning, monitoring, control) and regulation of cognition	Persistence, planning, task management.
Self-determination theory (SDT) (Deci, Ryan, & Richard, 1985)	Competence, relatedness, and autonomy (or self-determination), intrinsic and extrinsic motivation	Persistence, planning, task management.
Expectancy-value theory (Wigfield, & Eccles, 2000)	intrinsic factors-attainment and intrinsic value, and extrinsic-utility value and cost	Persistence, engagement.
Achievement Goal Theory (Kaplan & Maehr, 2007; Elliot & McGregor, 2001)	mastery-approach, mastery-avoidance, performance-approach and performance-avoidance goals.	Learning focus/mastery orientation, failure avoidance, self-sabotage/self-handicapping).
Test anxiety (Hembree, 1988; Sapp, 1999; Cassady, 2004)	High-cognitive test anxiety (high degrees of emotionality), helplessness attributions	Test anxiety, uncertain control, Disengagement.
Control Theory and Attribution Theory (Mischel, 1973; Weiner, 1992)	1. Locus of control (two poles: internal vs. external) 2. Stability (do causes change over time or not?) 3. Controllability (skills versus causes one cannot control such as luck, others' actions)	Test anxiety, uncertain control, disengagement, failure avoidance, self-sabotage/self-handicapping), learned helplessness.

Table 3: The adaptive and maladaptive variables of educational psychology theories

Learning dimension	Motivation and engagement factors		Variables
Adaptive (Positive constructs)	1	Self-belief (or self-efficacy)	Cognitive
	2	Learning focus (or mastery orientation)	
	3	Valuing school	
	4	Persistence	Behaviour
	5	Planning	
	6	Task management	
Maladaptive (Negative constructs)	1	Anxiety (or test anxiety)	Cognitive
	2	Failure avoidance	
	3	Uncertain control	
	4	Self-sabotage (or self-handicapping)	Behaviour
	5	Disengagement	

Chapter Three. Methodology

3.1 Exploring framework educational psychology theories on student motivation and engagement

3.1.1. Selection of instrument to data collection

In the preceding chapter, I have described relevant educational psychology theories and identified the various behavioural/cognitive variables that are adaptive/maladaptive in academic motivation and engagement (Table 3). This research will measure adaptive/maladaptive behavioural and cognitive motivational factors of students at their freshmen and graduating levels. This research design assumed a two-timed measurement hypothesising that CS School education approaches have a positive impact on the students' educational outcome.

According to Dornyei (2000), motivation processes happen over the students' schooling and this temporal dimension is conceptualised of motivation benefits the learner's behaviour psychologically. It is built on the teacher's active role in controlling and shaping the affective foundation of the learning process. In classroom setting, students are expected to learn and achieve new skills via goal setting and use of strategies in prolonged learning activities. In the next paragraphs I explore how the data would be collected to answer the main research question: to what extent are cognitive behavioural changes used to negotiate the environmental demands for academic engagement after three to four years of the CS School schooling?

3.1.2. Data collection: Quantitative, qualitative or both types

There are two major approaches to collection of data for a research study: qualitative and quantitative. Some researchers have used a mixture of both these methodologies. Some theoretical issues between qualitative and quantitative research inquiry are discussed (Table 4). As defined by Denzin & Lincoln (2000), 'qualitative researchers stress the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry ... They seek answers to questions that stress how social experience is created and given meaning' (ibid, p. 8). The researcher 'gathers, organizes and interprets information (usually in words and pictures) with his or her eyes and ears as a filter. It is a way of doing that often involves in-depth interviews and/or observations of humans in natural and social settings' (Lichtman, 2006, p. 23), thus summarising the philosophy and social construct of qualitative research.

Table 4: A summary of some theoretical issues on both methodologies

	Quantitative	Qualitative
1.	Value of type of data	
a.	Collection using survey.	Approach via interviews/observation.
b.	Data representative and generalisable information, eliminate the effect of the observer.	Disadvantage that data may be applicable to the specific participants and may not be reflective of worldview.
2.	Relative scientific rigor of the data	
a.	Data collected using standardized methods, can be replicated with validity and reliability statically.	Data can be analysed using sophisticated statistical techniques.
b.	Provide summative evaluations using "hard" measures.	Suitable for formative evaluations.
c.	However, data may not be accurate and valid because the students may not understand the meaning of questions to which they respond.	Available better techniques for classifying and analysing large bodies of descriptive data.
3.	Philosophies of evaluation	
	Use scientific model and develop sophisticated statistical techniques to measure social phenomena.	No objective social reality and all knowledge is "constructed" by observers who are the product of traditions, beliefs, and the social and political environments within which they operate.
4.	Selection methodology issues	
a.	Skill could be mastered easily with help of training manual.	Skills necessity example in focus group interview.
b.	Cost for short quantitative survey relatively cheap but provide only "limited" data.	Cost for focus group could also be cheap but may generate more hypotheses.
c.	Timeline for quantitative research may be faster because of available of technological software.	Timeline relative for qualitative research could use technology to inform the findings but may lead to more exploratory questions.

Source: Miles & Huberman (1994). *Qualitative Data Analysis*, Sage, Newbury Park, CA; The 2002 Westat (2003). *User Friendly Handbook*. National Science Foundation, Virginia, USA; Lichtman (2006). *Qualitative research in education: A user's guide*. Thousand Oaks, CA: Sage.; Creswell (2014). *Research design: qualitative, quantitative, and mixed methods approaches*. Thousand Oaks: SAGE Publications.

contrast, quantitative research is the emphasis on objective theories by measurement and statistical analysis of causal relationships between variables. Data is representative, able to generalise and replicate (Creswell, 2014). The quantitative design could be a survey/questionnaire being used in educational psychology studies such as motivation and engagement scale instrument (Liem & Martin, 2012).

The third type of data collection could be a combination of qualitative and quantitative data. An evaluation set of data can be improved by integrating different ways of knowing ensuring the limitations of one type of data are balanced by the strengths of another. There are several ways of combining the quantitative and qualitative methodologies³². The collection could either be parallel data using both methodologies at the same time or sequential where first data collection would inform collection of the other type of data. The purpose of combination could be: a) enriching when using qualitative to identify issues or obtain information that are not obtained by

³² Better Evaluation: Describe activities, outcomes, impacts and context (May 2013). <http://betterevaluation.org> (Accessed 2 February, 2018.)

quantitative surveys; b) examining hypotheses from qualitative data that could be tested via quantitative data; c) explaining unanticipated results from quantitative survey; and d) triangulation of confirming or rejection quantitative data by using the qualitative data.

3.1.3. Issues in data collection

In this case study the approach to data collection could be viewed as quantitative as there were a total of 286 students (entry-year freshmen, n=152; graduating students, n=134) available for study. It would provide data suitable for meaningful statistical analysis. A questionnaire consists of a set of questions that are answered according to the designated scale. Like all data collection, presence of outliers could be unusual or special in some way. Hence, by mixing quantitative with qualitative methods the evaluation data could explain or confirm/reject the quantitative results that are strengthened by qualitative data.

During my planning, I wrote to MOE to seek permission to do a research at the CS School using quantitative surveys (see Appendix 3, Annex A). Small focus groups would be interviewed consisting of teachers and students (randomised selection). This was meant to clarify any unanticipated results and confirming or rejecting any triangulated quantitated data from the students', teachers' and parents' surveys. However, as I was to start my data collection the founding Headteacher was seconded to MOE. In my special mention here is a narrative of the events.

Special mention

Prior to the commencement of this case study research, permission was obtained from the Ministry of Education (Appendix 3) and the Headteacher of the CS School (Appendix 4). Due to the CS School's primary centredness on maintaining the quality of their students' education, this research data collection was granted a one-time contact with the students.

With this knowledge, the quantitative method was chosen to collect the data. There were three main reasons: a) the number of 286 students (152 freshmen and 134 graduating students) would generate significance at the 5% level if it existed; and b) the paper-and-pencil surveys would produce students' self-report scores from their answers selected from a range of Likert scales; and c) a proposal to use a commercially tested questionnaire that fit the purpose of a survey³³. The use of a tested instrument would eliminate the numerous contacts with the students when setting up a new questionnaire. In addition, the one-time quantitative data collection contrasted with the

³³ An example: The Motivation and Engagement Scale (12th Edition), Lifelong Achievement Group, Sydney (www.lifelongachievement.com).

formative nature of a qualitative research that could lead to more hypotheses and more follow-up researches with triangulation of coded comments. As a result, qualitative data collection using small group interviews and parental surveys were not performed.

In summary, a one-time quantitative survey was conducted. Therefore, the anonymised data collected were put directly into a database at a password accessible stand-alone computer. Data were analysed at regular intervals. Hard data was summative to the surveys conducted during the one-time student-researcher interaction.

3.2. Theme

The research framework will integrate the educational psychology theories of motivation and engagement as described in the preceding paragraphs (Tables 2 & 3) with the consolidated formatted questionnaire as explained via the MES-HS Wheel³⁴ (see Appendix 1). The two positive constructs of learning consist of three adaptive cognitive factors (motivation boosters): self-belief (self-efficacy), learning focus (mastery orientation) and valuing school; and three adaptive behaviour factors (engagement boosters): persistence, planning study and time management. The two negative constructs of learning consist of three maladaptive (impeding motivation) cognitive factors: anxiety, failure avoidance and uncertain control; and two maladaptive behavioural (engagement guzzlers) factors which are self-sabotage (self-handicapping) and disengagement.

My view is that the less academically inclined students who have experienced an examination failure, feeling low esteem (Rahim, 1998) are attending the CS School. The CS School students in a positive environment (school structure and specific curriculum, selected teachers with relevant training, small class interactivity and a whole-school approach) would adopt effortful learning goals, apply positive self-regulatory strategies such as planning, monitoring and persistence (Ee & Moore, 2004) would be successful in skill certifications attainment. Therefore, graduating students would score higher than freshmen on the six adaptive factors of self-belief, mastery orientation, valuing school, persistence, planning study and task/time management. Expectedly, graduating students would score lower than the freshmen on maladaptive factors avoiding the negative maladaptive cognitive-behavioural factors of anxiety, failure avoidance, uncertain control, self-handicapping and disengagement.

³⁴ The MES-HS Wheel (Lifelong Achievement Group: www.lifelongachievement.com) by Dr. Andrew Martin. Basically, the instrument is grade or year level specific (High School grade is used in this study), contains basic questions (items) on school characteristics, respondent's academic performance and class and school engagement. It is a purchased, commercial instrument with password access user manual (see Appendix 2).

Research has shown that academic outcome is a triadic interaction of student, environment and behavioural variables (Tay-Koay, 1997; Reid, 2007). These interactions have provided the learning context to motivate and engage students actively and strategically (Stipek, 2002). The CS School's conceptual framework of positive psychology enhanced learning, cognitive engagement and instil students with positive beliefs on their personal ability and resilience to succeed educationally (Seligman, et al., 1995). Taking students' time at the CS School as an educational intervention, its imperative achievement worth noting is that 80-90% of the students have graduated with certified skills for employment and opportunity to pursue higher education endeavours. In totality, measurement of cognitive and behavioural variables would endorse the CS School's performance at improving students' meaning systems, students' remedial response on developing their competencies to growth and belief on the efficacy of effort during the study duration. This lived reality of school programmes that turnaround failing students to successful individuals with malleable belief in their ability is worth documenting.

3.2.1. Issues in the framework

This proposed quantitative case study research did not incorporate Dweck's social-cognitive approach to motivation that includes the interaction of people's belief, values and goals as meaning systems. Because beliefs and goals are domain-specific, situation-sensitive and malleable over time, people are usually not conscious of them until they become aware of the processes that are affecting them. The emotions that affect them through the theories of attributions, expectancies, goals and efficacy of future abilities are processes that eventually differentiated them.

Strong emotions of shame on failing an examination is a reality that could even end a young person's life (Alkhatib, 2016). On affective components of low self-esteem/self-worth/self-concept and improving academic grades, research studies have advocated reducing stereotype threat³⁵ (girls and minority students) by teaching incremental mindset (Aronson, Fried, & Good, 2002) or teaching students on contingencies of self-worth (Crocker & Knight, 2005) or intervention strategies to shift students' attention from potential social-class threats (Stephens, Hamedani, & Destin, 2014). Ng et al., (2012) have suggested school to consider implementing interventions that incorporate the "affect" component pertaining to self-concept to boost academic achievement or interventions to promote positive attribution style (Seligman, et al., 1995).

³⁵ "Stereotype threat" defined as a psychological phenomenon has been used in studies that involved gender effect and minority students whose relatively lower educational achievements were linked to the students being female or from a minority group as shown by Aronson et al (1998) studies.

Briefly, Dweck's (2000) socio-cognitive model linked implicit theories on how people evaluate their intellectual ability: fixed entity theorist and incremental theorist. Implicit theories are personal constructions about particular phenomenon that reside in the mind of individuals (Sternberg, Conway, Ketron, & Bernstein, 1981). People with entity theory believe that intelligence is fixed and cannot be improved much while those with incremental theory believe that intelligence is malleable and can be improved.

Students holding mastery-oriented mindsets seem concerned with learning new things and getting smarter by pursuing learning (mastery-oriented) goals (Dweck, 2000, pp. 20-28). Students with fixed-entity mindsets appear to be more concerned about performing well, choosing winning goals that validate their ability and to look smart by avoiding looking dumb. These vulnerable entity theorists may adopt a helpless stance that hinder learning such as not wanting to attend remedial classes for fear of being judged as having a 'lack of ability' (Hong, et al., 1999). Entity theorists have greater likelihood of engaging in maladaptive self-protective strategies that ultimately undermine their academic achievement with behaviours linking to procrastination (Howell & Buro, 2009) and disengagement (Burkley, et al., 2009).

Because these basic beliefs are associated with complex meaning systems and students' belief in their intelligence, lower endorsement of entity shows a better predictor of achievement and motivation in school (Castella & Byrne, 2015). It is possible then for underachieving students who are self-handicappers and disengaged educationally to shift their general behaviours to personal belief in one's ability to improve. Though the change may not be a simple process, the students could be taught to believe that their potential may change, performance improve and reinforce their beliefs in growth (Yeager & Walton, 2011). This is because of the perceptions of success or failure that interplayed in the real-world settings (Robins & Pals, 2002). In sum, entity mindset students could be taught to adopt positive learning behaviours that are adaptive and minimise their self-defeating behaviour that are maladaptive to their academic success.

An example such as in an implicit theories manipulation study, Dweck's fixed-entity students associate depression with failure more so than the incremental theorists (Dweck, 2000, p. 44-50). The difference is that the depressed incremental theorists cope much better (recover faster from depressed state) than even the non-depressed entity theorists. However, there would be a proportion of students with fixed-entity mindsets who would perform well in specific domains ensuring success and some would avoid challenging tasks through adopting helplessness, failure

avoidance goal, non-persistence at difficult tasks and self-handicapping (Rhodewalt, 1994). The entity theorists' vulnerability may lead to attribution of lack of effort to explain failure and protect self-esteem.

Other phenomenon of helpless response seen in bright young girls could be due to stereotyping of female role as less competent, societal beliefs on girls' limitations on achievement when compared to boys and teachers extolling mastery-orientated tasks to boys (Stipek & Gralinski, 1991). Therefore, freshmen who have failed uPE may have low emotional determinants (low self-esteem, depressive signs) associated with fixed-entity mindsets and girls could be more helpless (characterised by disengagement, self-handicapping, failure avoidance, uncertain control) than boys.

This case study research measures motivation and engagement dimensions at two points: freshmen (entry-point) and graduating year (exit-point). Because students' Implicit Theories Intelligence scale (Dweck, 2000) was not measured, the percent of entity theorists versus incremental theorists important in identifying intervention gaps would not be performed.

3.2.2. Design of research

The approach to this study comprises two parts to data acquisition in this research:

Part 1: Self-reporting surveys by the two groups of students and their respective class teachers.

Three instruments were used in this research measurement:

- a) Instrument 44-item MES-HS: Motivation and Engagement Scale - High School (MES-HS) instrument (Martin, A.J, 2012b),
- b) 4-item Academic Buoyancy questionnaire (Martin & Marsh, 2008), and
- c) Teachers' perceptions of student motivation and engagement and Teachers' enjoyment of teaching questionnaire (Martin, 2006a).

Part 2: Emotional Quotient Inventory: Bar-On Youth EQi: YV™ data from school repository for graduating students. EQi scales were measured at 2-timed point, namely entry-point (when graduating students were freshmen) and exit-point (graduating students when this case study research was conducted). Graduating students' EQi scores were integrated with MES-HS and academic buoyancy data. A triangulation of these findings was conducted to study any convergence of the quantitative data³⁶.

³⁶ The data were calculated and analysed using the Statistical Package for the Social Sciences (SPSS) version 20.

3.2.3. Instrumentation overview

3.2.3.1. The 44-item MES-HS instrument

This case study research used the Motivation and Engagement Scale - High School (MES-HS), an instrument that measures high school students' (age 12-18 years) motivation and engagement (Martin, 2012b). It was purchased with password-access material (see Appendix 2). It comprises of four higher order factors and 11 first order factors: adaptive cognition (self-efficacy, valuing school, mastery orientation), adaptive behaviour (planning, task management, persistence), impeding/maladaptive cognition (anxiety, failure avoidance, uncertain control) and maladaptive behaviour (self-handicapping, disengagement) with examples in Table 5. Each factor comprises four items and hence it is a 44-item instrument. To each item, students rate themselves on a Likert scale of 1 ('Strongly Disagree') to 7 ('Strongly Agree').

The commercial MES-HS instrument psychometric properties reported are gathered from data collected from 21,579 high school students from 58 schools (36 Government, 7 Systemic Catholic, and 15 Independent; 42 co-educational, 9 single-sex girls, 7 single-sex boys). Students were aged 12-13 years (31%), 14-15 years (36%), and 16-18 years (33%). The mean age of students was 14.52 (SD=1.57) years. Students were from Years 7 and 8 (35%), Years 9 and 10 (34%), and Years 11 and 12 (31%). In total, 55% of students were males and 45% females. The mean reliability (Cronbach's α) for the 11 subscales is 0.79.)

The MES-HS model separates motivation into factors that reflect enhanced motivation, those that reflect impeded or constrained motivation and those that reflect reduced motivation. These are called "boosters", "mufflers" and "guzzlers" respectively. The MES-HS instrument models students' thoughts, feelings and behaviours that underpinned their motivation and engagement in school. Booster cognitions are self-beliefs (or self-efficacy), learning focus and valuing of school while booster behaviours are persistence, planning and task/time management that reflect their thoughts, beliefs and attitudes. Mufflers are anxiety, failure avoidance and uncertain control behaviours. Guzzlers are disengagement and self-sabotage (or self-handicapping) behaviours.

All in all, the research premise will constitute a total of 11 motivational factors with a 4-item subscale per factor. Scores for the positive constructs provided the data for adaptive motivation, i.e. the higher the positive behavioural/cognitive variables score the more motivated was the student. Therefore, the "motivated student" would have lower scores for the negative behavioural / cognitive variables. Conversely, high scores for negative behavioural/cognitive variables means the student is maladaptive to learning. The data from students' behavioural / cognitive variables

would be the key determinants on the motivational changes during their schooling at the CS School. By measuring motivational variables at entry-point of freshmen and comparing them to exit-point of graduating students, data would delineate and answer the research questions.

In sum, the MES-HS instrument measures the motivational dimensions that are boosters in behaviours and cognitions while the maladaptive factors such as mufflers and guzzlers in learning. Therefore, the motivational-engagement factors comprise a conceptual framework of positive psychology for academic success. It correlates learning behaviours, cognitive engagement and positive beliefs about personal ability to negotiate school works and work towards desired learning.

Table 5: Examples of students’ motivation and engagement of 44-item MES-HS instrument

Factor	Likert Scale	* Example Likert-item	Learning Dimension
1	Self-efficacy	"If I try hard, I believe I can do my schoolwork well".	Adaptive
2	Valuing school	"I'm able to use some of the things I learn at school in other parts of my life".	
3	Mastery orientation / Learning Focus	"I feel very pleased with myself when I really understand what I'm taught at school".	
4	Planning	"I get it clear in my head what I'm going to do when I sit down to study".	
5	Study management	"When I study, I usually organize my study area to help me study best".	
6	Persistence	"If I can't understand my schoolwork at first, I keep going over it until I do".	
7	Anxiety	"When exams and assignments are coming up, I worry a lot".	Maladaptive
8	Failure avoidance	"Often the main reason I work at school is because I don't want people to think that I'm dumb".	
9	Uncertain control	"When I get a good mark I'm often not sure how I'm going to get that mark again".	
10	Self-handicapping	"I sometimes don't study very hard before exams so I have an excuse if I don't do so well".	
11	Disengagement	"I don't really care about school anymore".	

Note: * Refer to Appendix 6 for full 44-item MES-HS questionnaire.

3.2.3.2. Academic Buoyancy/Coping questionnaire

The Academic Buoyancy 4-item questionnaire was obtained with permission from Professor Andrew Martin³⁹, University of New South Wales, Australia. This instrument defines “academic buoyancy” as students' ability to successfully deal with academic setbacks and challenges that are typical of the ordinary course of school life (e.g., poor grades, competing deadlines, exam pressure, difficult schoolwork). It refers to students’ cognitive and behavioural attempts to manage the demands of a stressful situation or environment (Martin & Marsh, 2008, p. 56).

³⁹ Professor Andrew J. Martin, Scientia Professor and Professor of Educational Psychology, School of Education (Educational Psychology Research Group), University of New South Wales, Sydney, NSW 2052, Australia; Email: andrew.martin@unsw.edu.au

The 4-item academic coping scale are (Appendix 7):

- a) I'm good at dealing with setbacks (e.g. bad mark, negative feedback on my work).
- b) I don't let study stress get on top of me.
- c) I think I'm good at dealing with schoolwork pressures.
- d) I don't let a bad mark affect my confidence.

To each item, students rated themselves on a scale of 1 ('Strongly Disagree') to 7 ('Strongly Agree'). Therefore, measurement on all the 4 items would be positive. The purpose of using the Academic Buoyancy instrument was to estimate the 'students' ability to deal with the able ups and downs of everyday life in the academic context' (ibid. p. 54). Its measurement emphasised on positive psychology of school engagement underpinning academic buoyancy in areas of healthy school environment, adaptive personal factors, positive motivation with constructive interests and attitudes. The concept of academic buoyancy is at times described as everyday resilience.

Martin & Marsh (2008) explained that academic buoyancy is relevant to students with 'experience of isolated poor grades and patches of poor performance' and daily 'typical' stress levels and daily pressures; whereas academic resilience is relevant to 'overwhelming feelings of anxiety that are incapacitating' and threats to confidence as result of poor grade. It was proposed that academic buoyancy measurement may be beneficial to applying intervention to address situational 'dips in motivation and engagement' minimising risks academically (Martin & Marsh, 2006). In a longitudinal study involving 598 high school students (age 14-16 years), self-efficacy and engagement correlates positively with academic buoyancy whereas uncertain control and anxiety correlates negatively with academic buoyancy.

In other academic coping studies, students' mechanism of academic coping/everyday resilience could play a role in shaping students dis-engagement to re-engagement (Skinner & Pitzer, 2012). However, for at-risk children such as living in contemporary poverty, have mothers with less than high school education, with learning difficulties or endure persistent family economic hardship, they seem to develop coping strategies that may be contrary to a culture of achievement further ratifying their underclass status (Neuman, 2009).

To summarise, this case study research measured the academic coping scale scores of freshmen at entry-point and comparing them to graduating students at exit-point. The tangible and intangible support systems at the CS School is hypothesised to provide academic success skills to students and academic coping factors measurement could inform the CS School on their students' coping strategies.

3.3.3.3. Teachers' perceptions of student motivation and engagement and Teachers' enjoyment of teaching questionnaire

The Teachers' perceptions of students' motivation and engagement, and Teachers' enjoyment of teaching questionnaire was obtained with permission from Professor Andrew Martin, University of New South Wales, Australia (Martin, 2006a).

The Teachers' questionnaire is a shorter modified students' MES-HS instrument in a 10-item scale (Appendix 8). It assesses teachers' perceptions of students' motivation and engagement through six adaptive, two impeding, and two maladaptive dimensions. Each of the 10 dimensions were assessed through one-item questions on a Likert scale. Enjoyment is assessed through each item making it a total of 11-item instrument (Table 6). To each item, teachers rated on 1 ('Strongly Disagree') to 7 ('Strongly Agree').

The scale answered by teachers is a summary of single ratings. This is because single-item constructs are not as reliable as multi-item constructs. Martin (2006a) has tested the factor structure to ensure that items reflected the four hypothesised groups of adaptive cognitions, adaptive behaviours, impeding dimensions and maladaptive dimensions (see Appendix 1). Accordingly, CFA was carried out on the 10 items that specified the four-factor structure. The fit of the data to the model was very good (CFI5.97, RMSEA5.07, χ^2 25178.38, df531). In view of these findings showing that the teacher's summary rating scale is consistent with the higher order factor structure derived through the 40-item student instrument, it was considered a defensible proxy for the larger scale.

The purpose of using the Teachers' perceptions of student motivation and engagement and teachers' enjoyment of teaching instrument is built on the control-value theory achievement emotions that are defined as emotions tied directly to achievement activities or achievement outcomes (Pekrun, Frenzel, Goetz, & Perry, 2007). The integrative framework of the three-dimensional taxonomy of achievement emotions involves object focus of achievement emotions, their valence (positive vs negative; or pleasant vs unpleasant) and the degree of activation implied (activating vs deactivating). Accordingly, in academic engagement and performance, enjoyment is a pleasant academic emotion that is related to pride and hope (ibid. p. 16).

Table 6 : Teachers’ perceptions of students’ motivation and engagement using a modified 10-item MES and Teachers’ enjoyment of teaching

No.	Factor	Likert Item	Learning Dimension
1	Self-efficacy	“Most students in my class believe they can do a good job on their schoolwork”.	Adaptive
2	Valuing school	“Most students in my class believe that what they are taught at school is important and useful”.	
3	Mastery orientation / Learning Focus	“Most students in my class are focused on learning and improving more than competing and being the best”.	
4	Planning	“Most students in my class plan how they will do their schoolwork and check how they are going as they do it”.	
5	Study management	“I believe most students in my class use their study time well and try to study under conditions that bring out their best”.	
6	Persistence	“Most students in my class persist at their schoolwork even when it is challenging or difficult”.	
7	Failure avoidance	“A number of students in my class mainly do their schoolwork to avoid failure or disapproval from parents or teachers”.	Maladaptive
8	Anxiety	“A number of students in my class get quite anxious about their schoolwork and tests”.	
9	Uncertain control	“A number of students in my class do not think they have much control over how well they do at school”.	
10	Self-handicapping	“A number of students in my class seem to reduce their chances of doing well—for example, waste time, not study, disrupt others, procrastinate, etc”.	
11	Enjoyment of teaching	“On the whole, I enjoy being a teacher”.	Positive Construct

Note: See Appendix 8

Researchers Hatfield, et al., (1994) advocate that teachers’ enjoyment and enthusiasm of teaching could induce students’ enjoyment of learning as mechanism of emotional contagion, in turn students’ enjoyment, could enhance teachers’ positive effects. Students’ enjoyment is influenced by teacher’s enjoyment during teaching via observable enthusiastic teaching behaviour and this may change over the years as perceived by Grade 7 and 8 students (Frenzel, et al., 2009).

Teachers’ enjoyment is dependent on job satisfaction such as ‘the enjoyment of working with kids and making a meaningful difference in their lives’ (Wright & Custer, 1998, p. 66). It includes teachers’ efficacy from supporting school environment and its influence on student achievement despite the effects of socioeconomic (Hoy, et al., 1998). Also, experienced teachers provide instructional strategies and engage students because self-efficacious teachers invest more time teaching than controlling students with learning and/or behaviour difficulties (Yeo, et al., 2008).

In a phenomenological study on teachers’ enjoyment of work, Bredmar (2013) analysed teachers’ lifeworld experiences pertaining to joy-association: harmony and in-control classroom, good student-teacher interpersonal relationship, students’ feeling of belonging and well-being, satisfaction and contentment. These collectively-related activities are a result of teachers’ good

work. When teachers do not enjoy work, stress and anxiety are intertwined with the self and the whole classroom, teachers experienced a lack of energy and strength to carry out their daily work.

In totality teachers' enjoyment of teaching is contagion of positive students' classroom behaviour. Students' joy that result in enhanced learning strategies following teachers' key instruction tasks and ultimately students' academic outcome that equivalently ascribed to engagement. The instrument of teachers' perceptions of students' motivation and engagement will inform on teachers' inter-relation role that enhance their teaching professional capacity. The teachers' perception will be compared to students' self-report on their motivation and engagement dimensions. Teachers' perceptions of metacognitive dimension students' scores were moderately accurate but were not of the students' attributional beliefs or self-concepts (Carr & Kurtz-Costes, 1994). However, in Carr & Kurtz-Costes' study, teachers' perception of students' 'cognitive and motivational characteristics seemed to be biased by the teachers' perceptions' of the students' (known) achievement levels (ibid. p. 272).

Thus, its implication for intervention and management between teachers' professional development that needs teacher behavioural change and its impact on student learning is viewed positively as professional endeavours (Guskey & Yoon, 2009). In the convergence teachers' perception of students' learning and teachers' enjoyment with students' MES-HS learning dimensions and academic coping data, this case study research will inform on the various aspects of the CS School students motivation and engagement in positive schooling.

3.2.4. Participants

This case study measures motivation and engagement variables with two cohorts of students and their class teachers. This time-sensitive study involved freshmen and their class teachers; and graduating students and their class teachers (Table 7).

Table 7: Three instruments and the participants (students and class teachers)

No.	Survey	*Number of Students	
		Freshmen (F-S)	Graduating (G-S)
1	Instrument on Motivation and Engagement Scale (44-item) – High School (MES-HS) instrument (Martin, 2012 b)	152	134
2	Academic Buoyancy questionnaire (4-item) (Martin & Marsh, 2008)		
Survey		**Number of Class teachers	
		Freshmen (F-T)	Graduating (G-T)
3	Teachers’ Perceptions of Student Motivation and Engagement and Enjoyment of Teaching questionnaire (Martin, 2006)	11	11

*Note: *Students: Freshmen (F-S); Graduating students (G-S); ** Class teachers: Freshmen class teachers (F-T); Graduating students (G-T).*

Enrolment at the CS School

There are two types of enrolment:

- (a) 4-year programme is offered to freshmen who attempted uPE once (F-S Px-1) and failed, and
- (b) 3-year programme is offered to freshmen who attempted uPE twice (F-S Px-2) and failed on both occasions (see Figure 2).

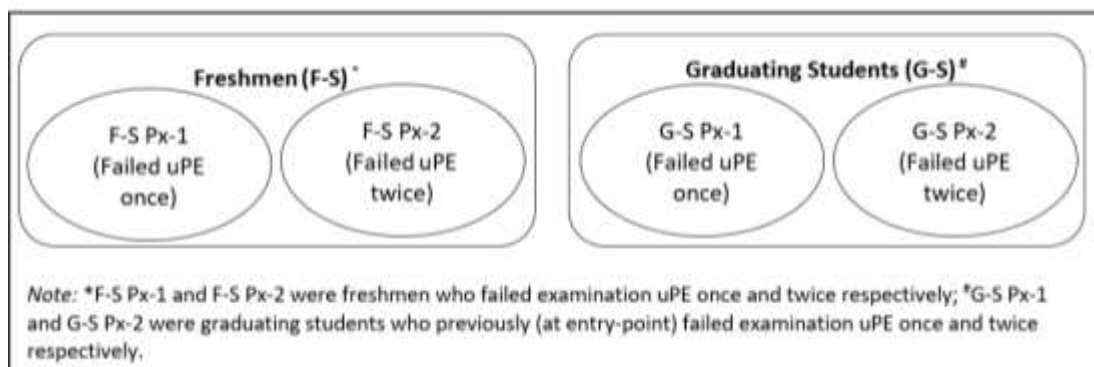
Freshmen and graduating students answered the MES-HS and Coping Buoyancy surveys:

1. Freshmen (F-S), n=152
 - a) 86 (F-S Px-1) enrolled in 4-year programme and
 - b) 66 (F-S Px-2) enrolled in 3-year programme

2. Graduating students (G-S), n=134

For graduating students, the G-S Px-1 and G-S Px-2 were students previously failed uPE once and failed uPE twice when they enrolled as freshmen respectively. G-S failure in examination status were used to use to analyse their EQi profile at entry-point and exit-point (longitudinal data).

Figure 2: Diagrammatic representation of student participants



3.2.5. Likert's scale measurement

Quantitative measurement using Likert-type items are single questions or statements that use aspects of Likert's original attitudinal measurement scale (Likert, 1932). Likert items could be combined into a single composite score/variable during the analysis process. This combined Likert items or Likert scale is used as a tool to provide a quantitative measure of attitude, character or personality traits in social science research (Boone & Boone, 2012).

In conventional practice, Likert items can be transformed into data and composite score/scale using SPSS to calculate the parametric statistics such as means and standard deviation. The Likert data are checked for its validity using the reliability index known as Cronbach's alpha. Cronbach's alpha is a statistic. It is a measure of internal consistency or reliability of a psychometric instrument or how well a set of variables/items measure a single, one-dimensional latent aspect of individuals.

According to McCleod (2008), a Likert-type data assumes that the strength/intensity of experience is linear, i.e. on a continuum from strongly agree to strongly disagree, and makes the assumption that attitudes can be measured. The data scale allows for degrees of opinion, and even no opinion.

In this case study research, a seven-point Likert Scale that allowed the participant to express how much they disagree or agree with a particular statement ranging from "Strongly Disagree" to "Strongly Agree" with numeric number from "1 to 7" with a neutral point being "Neither Agree nor Disagree" (Tables 8 & 9).

Table 8: Likert item and numeric score for MES-HS instrument

Disagree Strongly	Disagree	Disagree Somewhat	Neither Agree nor Disagree	Agree Somewhat	Agree	Agree Strongly
1	2	3	4	5	6	7

Table 9: Likert Scale and Likert-item from 44-item MES-HS package

Learning Dimension	Likert Scale (operational definition)	Likert-item	
Adaptive	Self-efficacy (Student's belief and confidence in their own ability to do well in their learning.)	Q13	If I try hard, I believe I can do my schoolwork well.
		Q23	If I don't give up, I believe I can do difficult schoolwork.
		Q33	If I have enough time, I believe I can do well in my schoolwork.
		Q40	If I work hard enough, I believe I can get on top of my schoolwork.
	Valuing school (Student's belief about the usefulness, importance, and relevance of the academic work they engage in.)	Q2	I feel very pleased with myself when I really understand what I'm taught at school.
		Q7	I feel very pleased with myself when I do well at school by working hard.
		Q25	I feel very pleased with myself when what I learn at school gives me a better idea of how something works.
		Q26	I feel very pleased with myself when I learn new things in school.
	Mastery Orientation / Learning Focus (Student's orientation to developing competence and knowledge in their learning.)	Q4	I'm able to use some of the things I learn at school in other parts of my life.
		Q14	Learning at school is important.
		Q34	What I learn at school will be useful one day.
		Q41	It's important to understand what I'm taught at school.
	Planning study (The extent to which students plan their academic work and tasks)	Q21	I get it clear in my head what I'm going to do when I sit down to study.
		Q27	Before I start an assignment, I plan out how I am going to do it.
		Q30	I try to plan things out before I start working on my homework or assignments.
		Q39	I usually stick to a study timetable or study plan.
	Study/task management (The ways students use their time, organize their timetable and choose to arrange where they work)	Q3	When I study, I usually study in places where I can concentrate.
		Q17	When I study, I usually organize my study area to help me study best.
		Q32	When I study, I usually try to find a place where I can study well.
		Q44	When I study, I usually study at times when I can concentrate best.
Persistence (The extent to which students sustain their engagement)	Q1	If I can't understand my schoolwork at first, I keep going over it until I do.	
	Q9	If my homework is difficult, I keep working at it trying to figure it out.	
	Q28	When I'm taught something that doesn't make sense, I spend time to try to understand it.	
	Q36	I'll keep working at difficult schoolwork until I've worked it out.	
Mal-adaptive	Anxiety (The extent to which students feel anxious when they think about or do their academic work.)	Q10	When exams and assignments are coming up, I worry a lot.
		Q19	I worry about failing exams and assignments.
		Q37	When I do tests or exams I don't feel very good
		Q43	In terms of my schoolwork, I'd call myself a worrier.
	Failure avoidance (The extent to which students' motivation to do their work is to avoid failure, doing poorly, or disappointing others.)	Q11	Often the main reason I work at school is because I don't want people to think that I'm dumb.
		Q20	Often the main reason I work at school is because I don't want people to think bad things about me.
		Q31	Often the main reason I work at school is because I don't want to disappoint my parents.
		Q38	Often the main reason I work at school is because I don't want my teacher to think less of me.
	Uncertain control (The extent to which students are uncertain about how to do well or how to avoid doing poorly.)	Q6	When I don't do so well at school I'm often unsure how to avoid that happening again.
		Q12	When I get a good mark I'm often not sure how I'm going to get that mark again.
		Q16	When I get a bad mark I'm often unsure how I'm going to avoid getting that mark again.
		Q18	I'm often unsure how I can avoid doing poorly at school.
	Self-handicapping (The extent to which the students compromise their chances of academic success so they have excuses if they do not do well.)	Q5	Sometimes I don't try hard at assignments so I have an excuse if I don't do well.
		Q24	I sometimes don't study very hard before exams so I have an excuse if I don't do so well.
		Q35	I sometimes do things other than study the night before an exam so I have an excuse if I don't do well.
		Q42	I sometimes put assessments and study off until the last moment so I have an excuse if I don't do so well.
Disengagement (Student's inclination to give up in their academic work or in achievement setting more generally)	Q8	Each week I'm trying less and less.	
	Q15	I don't really care about school anymore.	
	Q22	I've pretty much given up being involved in things at school.	
	Q29	I've pretty much given up being interested in school.	

Scores for 44-item MES-HS instrument

Scoring of the MES-HS questionnaire was according to instruction manual (Appendix 9). For simplicity, the MES-HS measures 2 major components of learning: adaptive and maladaptive learning dimensions.

The MES-HS instrument measures broadly two dimensions of motivation and engagement:

1. Adaptive learning dimension factors
 - Self-efficacy, valuing school, learning focus, planning, study management, persistence.
2. Maladaptive learning dimension factors
 - Anxiety, failure avoidance, uncertain control, self-handicapping, disengagement.

According to the MES-HS wheel (Appendix 1), the six adaptive learning dimensions (positive constructs) are separated into a 3-cognitive dimension (self-efficacy + valuing school + learning focus) and 3-behavioural dimension (planning + time/task management + persistence). For the maladaptive learning dimensions (negative constructs), there are 3 impeding cognitive dimensions (anxious + failure avoidance + uncertain control) and 2 maladaptive behavioural dimensions (self-sabotage or self-handicapping).

3.2.6. Administration of research instrument/questionnaire

After approval was obtained from the Ministry of Education and the CS School Headteacher, arrangement was made with the CS School for appropriate timings to meet with the students. All questionnaires/surveys were administered in English as it is the medium of pedagogy in Singapore.

Venue for student-participants

The administration of MES-HS instrument and Academic coping survey exercise was conducted at the Meeting Hall of the CS School between September-November 2012. It took place during the students' Interaction/bonding lesson-period so that normal scheduled teaching period would not be disrupted. During the researcher's visit, the following staff were in-attendance:

1. Vice Headteacher who introduced the research collection to the classes,
2. Head of Hospitality Department, and
3. Class teachers of Freshmen and Graduating Classes.

I began by explaining the purpose of the case study to the students and assured them that all their responses would be kept confidential. A projector was used. The survey questionnaire was shown on the screen. Then, I explained how the Likert scale of scoring works. If the student agreed with the question, he/she could circle from "somewhat agree =5" to "agree=6" to "strongly agree=7". If student had no decision or feeling neutral, then, he/she could circle "neither agree nor

disagree=4". If the student felt that he/she did not agree to the question asked then he/she could circle from "disagree somewhat=3", to "disagree=2" to "strongly disagree=1". I read question by question to the students pausing for 3-5 seconds between each question. At question #2 (and similarly for questions 25 and 26), I explained the word "pleased" as "happy" because the word "pleased" is not a commonly used word in the local context. The students did not ask me for any clarification. The whole session took about 40 minutes to complete the administration of the questionnaire.

Prior to the conduct of self-report survey, the MES-HS and Academic Buoyancy questionnaire was shown to the Vice-Headteacher who suggested that I read out the questions to the students because about 10-15% of the students may have low English language competency. In addition, reading out the question could prevent any response-order effects on Likert-type scales such as ambiguity in item question and avoid low motivation that may lead to unstable results (Weng & Cheng, 2000).

Class teacher participants

The Teachers' perceptions of students' motivation and engagement and Teachers' enjoyment of teaching survey was administered by the Vice-Headteacher. The class teachers completed the questionnaire and dropped the surveys into a box placed in the Vice-Headteacher's room. The researcher collected the surveys one week after placement of the questionnaire.

3.3. Summary

The framework of relevant educational psychology theories with identification of the various behavioural/cognitive variables that are adaptive/maladaptive in academic motivation and engagement is described. This quantitative research measured adaptive/maladaptive behavioural and cognitive learning dimensions and academic buoyancy of students at entry-point and exit-point. Class teachers provided their perceptions of students' cognitive and behavioural aspects and how these variables were related to their enjoyment of teaching. This research design proposed to know the educational variables that impacted the students' educational outcome.

In addition, this case study research incorporated graduating students' EQi scales measured using Youth EQi: YV™ instrument at their entry-point and exit-point. These two sets of EQi data were integrated with their MES-HS dimension factors and Academic Buoyancy data from this case study research measurement. In the final analysis, students' MES-HS dimension factors, academic coping and EQi were correlated with teachers' perceptions of students' motivation and teacher enjoyment of teaching in a convergence of the case study findings.

Chapter Four. Data findings

4.1. Structure of data presentation

The data analysis at the CS School include:

1. Students (freshmen F-S and graduating G-S)

Instruments used:

- a) Motivation and engagement scale for high school students 44-item MES-HS (Martin, 2012).
- b) 4-item Academic buoyancy coping instrument (Martin & Marsh, 2008).
- c) Emotional Quotient Inventory Bar-On Youth EQi: YV™⁴¹ data from school repository for graduating students (Bar-On & Parker, 2000).

2. Class teachers of freshmen (F-T) and graduating students (G-T)

Instruments used:

Modified MES-HS Teachers' perception of students' motivation and engagement (Martin, 2006a) and one-item Teachers' enjoyment of teaching survey.

3. Graduating students' Emotional Quotient (EQ) scores Youth EQi: YV™ from the CS School. All students at the CS School had their EQ assessed using Youth EQi: YV™ instrument at entry-point and exit-point. Two sets of Youths EQi scores were available from the graduating students' cohort. Calculations were performed using paired t-test (exit-entry EQ pair) and independent samples t-test. These results were correlated to their MES-HS dimension factors scores.
4. Data treatment followed the MES-HS instruction manual (Appendix 9). Some single item was not answered by the students. If only one item was missed from the 4-item scale, the score was manually calculated.

For example: For 4-item scale and student missed one item. Add the scores from the three items, divide by 3 and multiply by 4 (according to the MES-HS instruction manual).
5. Presentation of data would be:
 - a) descriptive summary (mean, standard deviation),
 - b) t-tests for comparison between freshmen and graduating students,

⁴¹ Bar-On EQI Inventory is an instrument purchased by CS School for their students. In this case study, students answered the questionnaire when they were in their first year (entry-point) and graduating year (exit-point). CS School uses students' EQi results to motivate and engage at learning.

- c) t-tests for comparison of EQi results of graduating students when they were freshmen and as graduating students (during this research).
- d) partition analysis on gender, ethnicity and uPE failure (P-1x vs P-2x) effects.

A summary was done at each section on students, class teachers and EQi scale findings. These findings were correlated and integrated with interpretation on some motivation and engagement variables.

4.2. Students' 44-item MES-HS questionnaire

4.2.1. Motivation and engagement dimension factor scores

Students' MES-HS scores were tabulated for each motivation and engagement dimension and it comprised of 4 items (Table 10). All student MES-HS scores were tabulated in excel spreadsheet (see Appendix 10). Data was exported over to SPSS for analysis.

Students' answers in the MES-HS questions on each factor that consists of four scale items scale were added. For example: self-efficacy = Q13 + Q23 + Q33 + Q40 (Appendix 6) and has a minimum of score of 4 and maximum of 28 (Appendix 11).

Table 10: Adaptive and maladaptive 4-item MES-HS scores (Appendix 11)

Positive constructs - Adaptive dimension scale (4-item total scores) Higher scores are better	Negative constructs – Maladaptive dimension scale (4-item total scores) Lower scores are better
Self-belief/Self-efficacy Q13_ + Q23_ + Q33_ + Q40_ = ___	Disengagement Q8_ + Q15_ + Q22_ + Q29_ = ___
Persistence Q1_ + Q9_ + Q28_ + Q36_ = ___	Self-sabotage/Self-Handicapping Q5_ + Q24_ + Q35_ + Q42_ = ___
Learning Focus/Mastery Orientation Q2_ + Q7_ + Q25_ + Q26_ = ___	Uncertain Control Q6_ + Q12_ + Q16_ + Q18_ = ___
Valuing School Q4_ + Q14_ + Q34_ + Q41_ = ___	Failure avoidance Q11_ + Q20_ + Q31_ + Q38_ = ___
Task/Time management Q3_ + Q17_ + Q32_ + Q44_ = ___	Anxiety Q10_ + Q19_ + Q37_ + Q43_ = ___
Planning study Q21_ + Q27_ + Q30_ + Q39_ = ___	

4.2.2. Participants descriptor

In this case study, 152 freshmen (F-S) and 134 graduating (G-S) students were partitioned into their ethnicities, gender and age (Table 11). F-S cohort consisted of 86 F-S P1-x who failed uPE once and 66 F-S P2-x who failed uPE twice. Age of the students ranged from 11 to 19 years old.

Malay students were overrepresented. There were about twice as many boys as girls. The ratios of female:male for the freshmen had a mean of 1:25, as compared to that for graduating students of 1:2. This set of data could suggest that some boys might have left the CS School before completion of their schooling. However, as these were two different cohorts of students, the female:male ratio change was not reflective in this case study.

Table 11: Summary of the demographic variables compared to the Singapore population census statistics

Parameters	Freshmen F-S		Graduating G-S	All students		% of Ethnicity National Population*
	F-S P1-x	F-S P2-x		Total	%	
Chinese	42	16	59	117	41	77
Malay	43	49	69	161	56	14
Indian	1	1	5	7	2	8
Others	0	0	1	1	1	1
Sub-Total	86	66				
Total (n=286)	152		134			
Gender						
Female	21	23	48	92	32	51
Male	65	43	86	194	68	49
Female: Male ratio	1:3	1:2	1:2			
Age						
Years	11 to 14	13 to 15	15-19			

*Source: <https://www.cia.gov/library/publications/the-world-factbook/geos/sn.html>. Accessed Dec 3, 2013.

4.2.3. Psychometric analysis of the 44-item MES-HS instrument and Academic Buoyancy survey

a) Reliability of the MES-HS instrument and Academic Buoyancy survey

The Cronbach's alpha values ranged 0.468-0.748 (Table 12). In the positive construct, the item means range from 5.924-5.191 (valuing school-planning study). Planning study had the lowest mean score at 5.191. In the negative construct, the item means ranged from 5.245-3.555 (failure avoidance-disengagement). In the maladaptive dimension of MES-HS, a lower score would be better. Failure avoidance had the highest mean score.

The inter-item correlations examine the extent to which scores on one item are related to all the other 3 items in each scale factor. Ideally, the mean inter-item correlations should be between 0.20 and 0.40 (Cohen & Swerdlik, 2005).

The inter-item correlations showed scale factor self-belief at 0.429 was the highest value while

persistence at 0.223 was the lowest value in the positive construct learning. In the negative construct, inter-item correlations ranged from 0.423 (anxiety and self-handicapping value) to 0.178 (disengagement). Scale factor disengagement value was out of range 0.20-0.40 inter-correlation value and this would be discussed together with other relevant variables in section 4.6.

Table 4: Summary of reliability of 44-Item MES-HS factors and academic coping scale ⁴²

MES-HS Dimension 4-item scale & Academic Buoyancy surveys	Cronbach's Alpha	Dimension Item Mean	Inter-Item Correlation	Learning Dimension
Self-Belief/Self-efficacy	0.745 [#]	5.855	0.429 ^{##}	Positive construct
Valuing School	0.699	5.924 [#]	0.368	
Mastery Orientation	0.645	5.789	0.317	
Planning study	0.700	5.191 ^{##}	0.376	
Task/Time Management	0.710	5.420	0.383	
Persistence	0.532 ^{##}	5.371	0.223 [#]	
Anxiety	0.544	3.784	0.423 [*]	Negative construct
Failure Avoidance	0.701	5.245 [*]	0.366	
Uncertain Control	0.595	4.644	0.268	
Self-handicapping	0.748 [*]	3.784	0.423 [*]	
Disengagement	0.468 ^{**}	3.555 ^{**}	0.178 ^{**}	
Academic Buoyancy	0.552	4.858	0.240	Academic coping
Note: [#] and [#] refer to highest and lowest mean values respectively in the positive construct. Item mean values, higher is better for positive construct of learning. [*] and ^{**} refer to highest and lowest values respectively in the negative construct. Item mean value, lower better for negative construct of learning.				

b) Principal Component Analysis (PCA)

PCA extraction showed that the total percent variance of the MES-HS instrument variables was explained by two components/factors: Component 1 and 2 (Table 13). The MES-HS 11-dimensions and academic coping 1-scale (total = 12 components) were separated into two major Components using the initial eigenvalues.

⁴² Presentation of data was 44-item MES-HS instrument comprises 11 scales and 4-item Academic Buoyancy questionnaire comprises one scale (academic coping) were tabulated together. Students answered both questionnaires during the one-time student-researcher interaction. Data are presented in one-table format.

Table 5: Total variance of variables by extraction method using Principal Component Analysis

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.805	40.044	40.044	4.491	37.429	37.429
2	1.850	15.419	55.463	2.164	18.034	55.463
3	1.033	8.606	64.069			
4	.768	6.402	70.471			
5	.645	5.374	75.846			
6	.562	4.687	80.533			
7	.527	4.390	84.923			
8	.475	3.957	88.881			
9	.419	3.489	92.370			
10	.343	2.858	95.228			
11	.295	2.458	97.686			
12	.278	2.314	100.000			

Note: Component 1-11 were MES-HS dimension factors; Component 12 was academic coping scale.

c) Rotation method varimax with Kaiser normalization

Further analysis on the extracted PCA using rotation method varimax yielded two major component matrix of constructs (Table 14).

- i) Component 1 explained the positive construct of six positive factors comprising:
 - Adaptive cognitive: self-belief, valuing school and mastery orientation on learning focus,
 - Adaptive behavioural: planning, tasks/time management and persistence.
- ii) Component 2 explained the five negative construct factors comprising:
 - Impeding cognitive: anxiety, failure avoidance, uncertain control,
 - Maladaptive behavioural: self-handicapping and disengagement.

These two components of factors are similar to the validated MES-HS Wheel (see Appendix 1) and therefore was validated for this case study research usage. The academic coping instrument was not part of the MES-HS wheel but was analysed together for convenience purpose.

Table 6: Rotated Component Matrix using PCA extraction method

44-item MES-HS Instrument & Academic Buoyancy surveys	Component		
	1	2	
Self-Belief/efficacy	.837	.092	Adaptive Cognitive
Valuing School	.831	-.003	
Mastery Orientation	.784	-.052	
Planning study	.741	.187	Adaptive Behavioural
Task/Time Management	.767	.141	
Persistence	.793	.087	
Anxiety	.482	.504	Impeding Cognitive
Failure Avoidance	.394	.523	
Uncertain Control	.361	.541	Maladaptive Behavioural
Self-Handicapping	-.067	.794	
Disengagement	-.198	.744	
4-item Academic Buoyancy survey	.397	.291	

d) The 4-item Academic Buoyancy instrument

The academic coping scale comprised 4-item questionnaire (Appendix 7). It was weakly related to component 1 and 2, because it did not belong to the MES-HS instrument. This finding implied that academic coping factor was measuring another facet of motivation and engagement learning that was not associated to the MES-HS factors (Table 14).

4.2.4. Descriptive variables in MES-HS dimensions

The item-means, standard deviations and distribution of the MES-HS and Academic Buoyancy variables of the students’ scores were presented in Table 15. The normality of distribution of all variables were examined by assessing the skewness and kurtosis of the distributions. Most of the variables fall within the acceptable values of ± 2 .

In the six positive adaptive learning factors (self-belief, valuing school, mastery orientation, planning study, tasks/time management and persistence), valuing school has the highest mean of 23.6 while planning study has the lowest mean score of 20.6 indicating weak positive factor. For the five maladaptive factors (anxiety, failure avoidance uncertain control, self-handicapping and disengagement), disengagement has the lowest score of 14.2 (the lower the score, the better indication of motivation) while failure avoidance has the highest mean score 21.0. Academic coping scale had a mean score of 19.4 that is lower than the valuing school and just lower than failure avoidance (second highest in the maladaptive learning dimension).

Table 7: Descriptive statistics of key variables (overall sample)

Students (N=286)	N	Mean 4-item*	Std. Deviation	Skewness	Kurtosis
Self-Belief/self-efficacy	285	23.3	4.52	-1.381	2.069
Valuing School	286	23.6	4.15	-1.552	3.234
Mastery Orientation	286	23.1	3.91	-1.185	1.498
Planning study	286	20.6	5.06	-.691	.150
Tasks/times Management	286	21.7	4.86	-.780	.260
Persistence	286	21.4	4.08	-.804	.566
Anxiety	286	20.3	5.14	-.739	.425
Failure Avoidance	286	21.0	5.37	-.848	.429
Uncertain Control	286	18.4	4.89	-.498	.205
Self-Handicapping	286	15.1	6.08	-.054	-.763
Disengagement	286	14.2	4.99	-.078	-.394
Academic Coping	285	19.4	4.62	-.467	.488
Valid N (listwise)	284				

Note: *Mean was the addition of 4 items of each factor (see Table 10). Likert scale score ranged from 4-28.

4.2.5. Correlation study: MES-HS and Academic Buoyancy variables

The correlation of the 11-scale MES-HS factors and Academic Buoyancy scores values are summarised in Table 16. Three specific groupings of inter-item values were observed.

- a) Group 1: Six positive dimension factors comprising of self-belief, valuing school, mastery orientation on learning, planning study, tasks/times management and persistence. Inter-correlation values ranged from .466 to .677.
- b) Group 2: Three negative constructs (see to MES-HS Wheel of Appendix 1) referred as impeding cognitive factors of anxiety, failure avoidance and uncertain control. Inter-item correlation values ranged from .202 to .476.
- c) Group 3: Two maladaptive behaviours of disengagement and self-handicapping. Inter-item correlation value was .512. This further validated that disengagement and self-handicapping were similar to the MES-HS wheel property.
- d) These three groups of adaptive, impeding and maladaptive factors were similar to the MES-HS Wheel (Appendix 1).
- e) Academic coping and MES-HS dimension scale factors scores ranged from .129 to .405 with the lowest score of .129 at uncertain control and highest score at .405 with planning study (Table 16). This finding implied that academic coping could be associated with planning study.

Table 16: Inter-item correlations of the MES-HS 11 dimensions and academic coping

Inter-Item Correlation Matrix												
MES-HS factors & Academic coping	1	2	3	4	5	6	7	8	9	10	11	12
1. Self-Belief	1.000											
2. Valuing School	.657	1.000										
3. Mastery Orientation	.626	.677	1.000									
4. Planning	.578	.546	.466	1.000								
5. Time Management	.635	.530	.474	.629	1.000							
6. Persistence	.640	.567	.574	.561	.567	1.000						
7. Anxiety	.372	.364	.346	.357	.395	.378	1.000					
8. Failure Avoidance	.360	.337	.236	.293	.309	.265	.454	1.000				
9. Uncertain Control	.288	.297	.202	.272	.332	.326	.476	.413	1.000			
10. Self-Handicapping	.068	-.023	.006	.103	.099	.027	.261	.242	.253	1.000		
11. Disengagement	-.033	-.114	-.110	.064	-.050	-.020	.126	.146	.165	.512	1.000	
12. Academic Coping	.304	.292	.217	.405	.279	.337	.201	.251	.129	.157	.151	1.000

4.2.6. Summary of comparison study: MES-HS and academic coping variables scale scores

a) The summary of the 11-dimension MES-HS factors and academic coping scale scores (Table 17) showed that the graduating students (G-S) scored slightly higher than the freshmen on positive learning construct except for planning study and tasks/time management. These findings of graduating students scoring lower on planning study and tasks/time management when compared to the freshmen scores could imply that these could be specific areas of concern for the CS School to manage students' learning.

b) Graduating students scored lower on maladaptive factors such as anxiety, failure avoidance uncertain control, self-handicapping and disengagement. This finding implied that graduating students' self-reported cognitive and behavioural components showed that they were less anxious, more in control, less attributional and more engaged in school.

c) Graduating students seemed to cope better academically than freshmen. However, the changes in motivation or engagement factors and academic coping scale between graduating students and freshmen were not statistically significant.

Table 8: Graduating students (G-S) and freshmen (F-S) variables (independent samples t-test)

Measurement instrument	F-S (n=152) G-S (n=134)	Year	Mean (4-item)	Std. Deviation	Difference of mean	t	Sig. (2-tailed)
44-item MES-HS survey: Adaptive to learning (Scores higher are better)	Self-belief	G-S	23.4	3.96	0.1	0.23	.819
		F-S	23.3	4.97			
	Valuing School	G-S	23.8	3.86	0.3	0.68	.498
		F-S	23.4	4.38			
	Mastery Orientation	G-S	23.3	3.65	0.3	0.55	.584
		F-S	23.0	4.14			
	Planning study	G-S	20.6	4.40	-0.1	-0.16	.873
		F-S	20.7	5.60			
Tasks/times Management	G-S	21.4	4.34	-0.5	-0.95	.344	
	F-S	21.9	5.28				
Persistence	G-S	21.5	3.75	0.1	0.19	.851	
	F-S	21.4	4.36				
44-item MES-HS survey: Maladaptive to learning (Scores lower are better)	Anxiety	G-S	19.8	5.28	-0.9	-1.47	.142
		F-S	20.7	4.98			
	Failure Avoidance	G-S	20.4	5.18	-1.0	-1.56	.120
		F-S	21.4	5.51			
Uncertain Control	G-S	17.9	4.70	-1.0	-1.67	.096	
	F-S	18.9	5.03				
Self-Handicapping	G-S	15.0	6.06	-0.2	-0.25	.802	
	F-S	15.2	6.11				
Disengagement	G-S	14.1	4.63	-0.1	-0.22	.828	
	F-S	14.3	5.30				
Academic Buoyancy Survey	Academic Coping	G-S	19.8	3.99	0.7	1.20	.232
		F-S	19.1	5.10			

4.2.7. Partition analysis: gender effect in MES-HS dimension factors and Academic Buoyancy surveys

Partition analysis on gender study showed girls scored lower than boys on self-belief, planning study, tasks/time management and persistence but they valued school and mastery orientation at learning more than boys (Table 18). Also, girls scored higher on anxiety, uncertain control, self-handicapping and disengagement than boys. Nevertheless, these differences in MES-HS dimensions' scores at gender level were not statistically significant.

Academic coping showed boys coped better than girls, as shown to be statistically significant at $p < .05$ (Table 18). At section 4.2.5. (Table 16), academic coping was correlated to planning study. Did it mean that girls would need more help at planning study? Moreover, the overall students' 4-item mean score for planning study was the lowest at 20.6 (see Table 15). Again, planning study would be an indicator for improvement of the CS School students' learning.

Table 9: Partition analysis: gender effect MES-HS dimension scale and academic coping scores (independent samples t-test)

Instrument	Female (n=92) Male (n=194)	Gender	Mean of 4-item	Std Deviation	Difference of mean	t	Sig. (2- tailed)	
44-item MES-HS survey:	Self-belief	Female	23.1	5.13	-0.4	-0.69	.490	
		Male	23.5	4.20				
	Valuing School	Female	23.6	3.89	0.1	0.10	.920	
		Male	23.6	4.27				
	Mastery Orientation	Female	23.2	3.57	0.1	0.21	.836	
		Male	23.1	4.07				
	Planning study	Female	20.2	5.26	-0.6	-0.89	.375	
		Male	20.8	4.97				
	Tasks/times Management	Female	21.5	5.43	-0.3	-0.43	.670	
		Male	21.8	4.59				
	Persistence	Female	21.3	4.35	-0.3	-0.52	.602	
		Male	21.5	3.96				
	44-item MES-HS survey:	Anxiety	Female	20.5	4.62	0.3	0.41	.684
			Male	20.2	5.37			
Failure Avoidance		Female	20.8	5.08	-0.2	-0.25	.805	
		Male	21.0	5.51				
Uncertain Control		Female	18.5	4.53	0.1	0.12	.909	
		Male	18.4	5.06				
Self-Handicapping		Female	15.5	5.94	0.7	0.87	.384	
		Male	14.9	6.14				
Disengagement		Female	14.3	4.84	0.2	0.26	.794	
		Male	14.2	5.07				
Academic Coping Survey		Academic Coping	Female	18.4	4.85	-1.5	-2.55	.011*
			Male	19.9	4.43			

Note: *Significance at $p < .05$

4.2.8. Partition analysis: ethnicity effect in MES-HS and Academic Buoyancy MES-HS dimension factors and Academic Buoyancy

Partition analysis on ethnicity study showed that there were differences in scores between ethnic groups (Table 19). In the MES-HS adaptive dimensions, Indian students scored highest in self-efficacy, valuing school, learning focus, planning study and persistence (except task management). They also scored the highest in academic coping among the three ethnicities.

In the MES-HS maladaptive dimensions, the Malay students scored highest in anxiety, failure avoidance, self-handicapping and disengagement than the Indian or the Chinese students. These

ethnicity data contextualised among the three ethnicities were statistically tested post hoc analyses to further explore the interrelationships between the three ethnic groups.

The one-way ANOVA analysis showed that the Malay students had significantly more mastery learning orientation than Chinese students ($p < .05$) but were more anxious than Indian students ($p < .01$). Indian students scored significantly lowest on disengagement among the three ethnic groups (Table 20). Indian students were also significantly less disengaged than the Malay or Chinese students. There was no significant difference in academic coping scores at ethnicity level.

Table 10: Descriptive statistics of key variables (scales) according to ethnicity

Scale	Ethnicity	N	Mean of 4-item	Std. Deviation
Self-Belief/Efficacy	Chinese	114	22.7	4.91
	Malay	163	23.7	4.13
	Indian	7	25.4	2.44
Valuing School	Chinese	115	23.1	4.85
	Malay	163	23.9	3.56
	Indian	7	26.1	1.68
Learning Focus/Mastery Orientation	Chinese	115	22.3	4.28
	Malay	163	23.6	3.51
	Indian	7	25.3	4.07
Planning study	Chinese	115	19.9	5.64
	Malay	163	21.1	4.64
	Indian	7	22.0	3.21
Tasks/times Management	Chinese	115	21.2	5.20
	Malay	163	22.1	4.61
	Indian	7	20.7	4.19
Persistence	Chinese	115	20.8	4.03
	Malay	163	21.8	4.08
	Indian	7	24.3	3.09
Anxiety	Chinese	115	19.6	5.45
	Malay	163	21.0	4.57
	Indian	7	15.1	7.58
Failure Avoidance	Chinese	115	20.4	5.71
	Malay	163	21.5	5.02
	Indian	7	17.1	6.07
Uncertain Control	Chinese	115	17.8	4.59
	Malay	163	18.9	5.03
	Indian	7	18.6	6.13
Self-Handicapping	Chinese	115	14.5	6.42
	Malay	163	15.6	5.75
	Indian	7	12.9	6.59
Disengagement	Chinese	115	13.9	5.07
	Malay	163	14.6	4.85
	Indian	7	8.4	3.46
Academic Coping	Chinese	115	19.1	4.84
	Malay	162	19.6	4.53
	Indian	7	20.3	2.98

Briefly, Indian students seemed to be more motivated and engaged among the ethnic groups. Meanwhile, mastery orientation scores showed Malay students like studying at the CS School when compared to Chinese students. Considering that Malay students were the major group as compared to only seven Indians, there would be considerable peer group effects among the three racial groups.

Table 11: One-way ANOVA comparison of the means at ethnicity level

Dependent Variable			Mean Difference (I-J)	Sig. (2 tailed)
Scales	Ethnicity (I)	Ethnicity (J)		
Self-Belief	Chinese	Malay	-1.03	0.138
		Indian	-2.72	0.258
	Malay	Chinese	1.03	0.138
		Indian	-1.69	0.586
	Indian	Chinese	2.72	0.258
		Malay	1.69	0.586
Valuing School	Chinese	Malay	-0.83	0.223
		Indian	-3.08	0.132
	Malay	Chinese	0.83	0.223
		Indian	-2.25	0.33
	Indian	Chinese	3.08	0.132
		Malay	2.25	0.33
Mastery Orientation Malay > Chinese	Chinese	Malay	-1.266	0.020**
		Indian	-2.94	0.125
	Malay	Chinese	1.266	0.020**
		Indian	-1.67	0.5
	Indian	Chinese	2.94	0.125
		Malay	1.67	0.5
Planning Study	Chinese	Malay	-1.16	0.146
		Indian	-2.07	0.544
	Malay	Chinese	1.16	0.146
		Indian	-0.91	0.886
	Indian	Chinese	2.07	0.544
		Malay	0.91	0.886
Task/Time Management	Chinese	Malay	-0.96	0.238
		Indian	0.45	0.969
	Malay	Chinese	0.96	0.238
		Indian	1.41	0.732
	Indian	Chinese	-0.45	0.969
		Malay	-1.41	0.732
Persistence	Chinese	Malay	-0.97	0.119
		Indian	-3.47	0.072
	Malay	Chinese	0.97	0.119
		Indian	-2.49	0.248
	Indian	Chinese	3.47	0.072
		Malay	2.49	0.248
Anxiety Malay > Indian	Chinese	Malay	-1.4	0.059
		Indian	4.47	0.059
	Malay	Chinese	1.4	0.059
		Indian	5.86	0.008*
	Indian	Chinese	-4.47	0.059
		Malay	-5.86	0.008*
Failure Avoidance	Chinese	Malay	-1.12	0.201
		Indian	3.26	0.261
	Malay	Chinese	1.12	0.201
		Indian	4.37	0.087
	Indian	Chinese	-3.26	0.261
		Malay	-4.37	0.087
Uncertain Control	Chinese	Malay	-1.04	0.19
		Indian	-0.75	0.919
	Malay	Chinese	1.04	0.19
		Indian	0.29	0.987
	Indian	Chinese	0.75	0.919
		Malay	-0.29	0.987
Self-Handicapping	Chinese	Malay	-1.08	0.309
		Indian	1.66	0.76
	Malay	Chinese	1.08	0.309
		Indian	2.74	0.469
	Indian	Chinese	-1.66	0.76
		Malay	-2.74	0.469
Disengagement Indian < Chinese Indian < Malay	Chinese	Malay	-0.72	0.456
		Indian	5.49	0.012**
	Malay	Chinese	0.72	0.456
		Indian	6.21	0.003*
	Indian	Chinese	-5.49	0.012**
		Malay	-6.21	0.003*
Academic Coping	Chinese	Malay	-0.43	0.731
		Indian	-1.14	0.803
	Malay	Chinese	0.43	0.731
		Indian	-0.71	0.916
	Indian	Chinese	1.14	0.803
		Malay	0.71	0.916

Note: *Significance at $p < .01$; ** Significance at $p < .05$.

4.2.9. Partition analysis: failure at uPE effect in MES-HS dimension factors and academic coping

Partition analysis was performed on freshmen’s MES-HS dimensions and academic coping scores at entry-point. It compared scores of freshmen who failed uPE once (F-S P1-x) with freshmen who failed uPE twice (F-S P2-x).

On comparison, data showed F-S P2-x cohort scored significantly higher in learning focus ($p<.01$) and significantly lower on disengagement score ($p<.05$) than F-S P1-x (Table 21). This self-reported data could signify that freshmen who failed uPE twice were more motivated at learning and more engaged at schooling than freshmen who failed uPE once.

In summarise, the experience of failure could serve as an impetus for the failed twice students to strive harder at learning by becoming more engaged at school while needing more help at study. Would this strategy hold evidence after three years of schooling at the CS School?

Table 12: Partition analysis: failure at examination effect (independent samples t-test)

Measurement instrument	F-S P1-x (n=66) F-S P2-x (n=86)	Failure status	Mean of 4-item	Std. Deviation	Mean Difference	t	Sig. (2-tailed)	
44-item MES-HS survey: Adaptive constructs	Self-belief	F-S P1-x	23.0	5.2	-0.6	-0.68	.500	
		F-S P2-x	23.6	4.7				
	Valuing School	F-S P1-x	23.2	4.4	-0.5	-0.70	.485	
		F-S P2-x	23.7	4.4				
	Mastery Orientation	F-S P1-x	22.2	3.9	-1.8	-2.65	.009*	
		F-S P2-x	24.0 [#]	4.2				
	Planning study	F-S P1-x	20.7	5.2	0.2	0.18	.855	
		F-S P2-x	20.6	6.2				
	Task/Time Management	F-S P1-x	21.5	5.5	-0.9	-1.06	.289	
		F-S P2-x	22.5	5.0				
	Persistence	F-S P1-x	21.0	4.1	-0.9	-1.22	.224	
		F-S P2-x	21.9	4.7				
	44-item MES-HS survey: Maladaptive constructs	Anxiety	F-S P1-x	20.6	4.9	-0.1	-0.13	.900
			F-S P2-x	20.7	5.1			
Failure Avoidance		F-S P1-x	21.9	5.6	1.2	1.29	.199	
		F-S P2-x	20.8	5.3				
Uncertain Control		F-S P1-x	19.0	4.6	0.3	0.36	.717	
		F-S P2-x	18.7	5.5				
Self-Handicapping		F-S P1-x	15.9	6.2	1.8	1.78	.077	
		F-S P2-x	14.2	6.0				
Disengagement		F-S P1-x	15.2	5.2	2.2	2.59	.011**	
		F-S P2-x	13.0 ^{##}	5.2				
Academic Buoyancy Survey		Academic Coping	F-S P1-x	19.3	5.0	0.4	0.45	.654
			F-S P2-x	18.9	5.3			

Note: [#]Higher value is better; ^{##}Lower value is better; *Significance at $p<.01$; **Significance at $p<.05$.

4.2.10. Summary of findings of students' MES-HS and academic coping surveys

a) In this case study, Malay students were overrepresented. There were more boys than girls at the CS School. The ratios of female:male ranged from average of 1:25 at entry-point enrolment of F-S, compared to 1:20 at exit-point of G-S cohort.

b) The psychometrics of 44-item MES-HS instrument was validated for this case study (Martin, 2012b).

c) Overall motivation and engagement variables scores of graduating students were higher than the freshmen cohort though there was no significant difference between their MES-HS dimensions and academic coping scale scores.

d) Disengagement had the highest correlation value of .512 with self-handicapping. Inter-item correlation showed that academic coping correlated with MES-HS dimension adaptive factor on planning study (see Table 16). Academic coping correlated positively to the 11 scales of the MES-HS dimensions.

e) In this case study, girls valued schooling and liked learning, but they were unable to cope academically ($p < .05$) as they were less persistent and more disengaged than boys. These results were compared to Martin's (2003) study that used the same MES-HS instrument. Martin (2003) found girls rated significantly higher than boys in six dimensions of self-belief, value of school, learning focus, planning, task/time management and persistence. In comparison, the girls in this case study scored higher than boys on value of school and learning focus only (out of the six factors). Even so, these scores were not statistically significant.

f) Malay students scored higher than Chinese students on all the positive adaptive MES-HS dimension factors with significant focus on mastery orientation on learning ($p < .05$). Perhaps the CS School had provided a conducive learning support and the necessary ecological factors⁴³ (Bronfenbrenner, 1994) for Malay students, who formed 56% of the total student population (see Table 11). The seven Indian students had the lowest scores on disengagement among the three ethnic groups ($p < .01$). There was no significant difference on academic coping scores at ethnicity level. In sum, the Indian students seemed to be motivated and engaged, the Malay students liked studying and the Chinese students managed well with stress at the CS School.

⁴³ According to Bronfenbrenner, the ecological model on human development in actual environment. There are 5 differentiated environments of nested structures moving from inner most to outer structures: Microsystem ("face-to-face" setting), mesosystem (linkage between child and peer, school and parent), exosystem (linkages and processes between two or more settings), macrosystem (linkage with social institutions) and chronosystem (development over time).

g) The freshmen who failed uPE twice self-reported higher score on learning focus ($p < .01$) and were less disengaged ($p < .05$) than the freshmen who failed uPE once ($p < .05$). Perhaps, a second chance at schooling could have provided an impetus to be motivated and engaged (CS, 2014). Is this similar to the Pygmalion effect, or Rosenthal effect (observed phenomenon) whereby higher expectations lead to an increase in performance – a form of self-fulfilling prophecy (Rosenthal & Jacobson, 1968)? Perhaps having failed uPE twice and being informed that this was their second chance at schooling at the CS School could have provided the situation in answering the survey in a positive slant. Or could it be the fact that questionnaires were answered in the presence of a vice-Headteacher, Head of department and class teachers that students felt obliged to slant it in a similar manner like the Pygmalion effect? Or was it a psychological reaction that motivated the group who had experienced a repeated failure to study harder (Brehm, 1993)?

A follow-up of F-S P2-x graduates' academic results (three-year schooling) when compared with F-S P1-x graduates (four-year schooling) would inform if this self-report was accurate. Unfortunately, academic outcome was not available to predict the "striving" effect of the students. However, for future studies, students would answer the questionnaires in the absence of the CS School's senior management to remove any possible Pygmalion effect.

4.3. Class teachers' Perceptions of Student Motivation and Engagement and Enjoyment of Teaching surveys

4.3.1 Class teachers' participation

A summary of class teachers' descriptors is listed in Table 22. There were 11 freshmen class teachers (F-T) and 11 graduating-students class teachers (G-T). Gender was not available for one G-T. The teachers' years of teaching ranged from 4 months to 20 years.

Table 13: Summary of class teachers' descriptor

Class teacher/Gender	Freshmen (F-T)	Graduating students (G-T)	Number
Female	7	5	12
Male	3	6	9
Unspecified	1	0	1
Total	11	11	22
Mean years of teaching (Range)	10 (0.3 -20)	13 (8-20)	-

4.3.2. Comparison of Teachers' perceptions of students' motivation and engagement, and Teachers' enjoyment of teaching

The MES-HS dimension factor scores of freshmen class teachers F-T (n=11) and graduating students class teachers G-T (n=11) showed that G-T perceived their students were more motivated and engaged than F-T on adaptive learning dimensions of self-efficacy, valuing school, mastery orientation, planning study, tasks/time management except on persistence factor. While in the maladaptive dimensions, G-T perceived scores on their students were lower than F-T scores. This means that the G-T perceived their graduating student to have a positive outcome on improvement on motivation and engagement. However, the perception of self-handicapping factor for the graduating students seem to be higher than the freshmen (Table 23). Visually self-handicapping is a behavioural activity. Hence, it would be easily perceived by the teachers.

Overall, G-T perceived their graduating students had improved on their self-efficacy ($p < .01$) when compared to F-T perceptions of freshmen. However, the class teachers scored low on students' planning study at 3.5 (F-T) and 4.2 (G-T). Mean score for planning by class teachers was 3.8. This compared similarly with time management at a score 3.8. Interestingly, this was exactly what scored lowest in the students' self-report on planning study dimension (see Table 12). This observation by class teachers, being accurately reflected by their students' self-reported lowest scores on planning study, deserved special attention in promoting students' learning journey.

The class teachers of freshmen seemed to enjoy teaching more than those of graduating students, though the finding was not significant (Table 23). This set of data would be further analysed in the section on *Teachers' enjoyment of teaching and years of teaching*.

Table 14: Partition analysis: Class teachers' variables (independent samples t-test)

Measurement instrument	MES-HS Dimension factor	Class teacher	Mean of factor	Std. Deviation	Mean Difference	t	Sig. (2-tailed)
44-item MES-HS survey	Self-belief	F-T	3.9	1.2	-1.4	-3.41	.003*
		G-T	5.3	0.6			
Freshmen (F-T) (n=11)	Valuing School	F-T	4.8	1.0	-0.7	-2.06	.053
		G-T	5.5	0.5			
Graduating (G-T) (n=11)	Mastery Orientation	F-T	4.9	1.0	-0.3	-0.73	.474
		G-T	5.2	0.7			
	Planning study	F-T	3.5	1.1	-0.7	-1.42	.172
		G-T	4.2	1.1			
	Task/Time Management	F-T	3.8	0.9	0.0	-0.07	.945
		G-T	3.8	1.3			
	Persistence	F-T	4.4	0.8	0.1	0.33	.745
		G-T	4.3	1.2			
	Anxiety	F-T	4.8	0.9	0.0	-0.06	.952
		G-T	4.8	1.5			
	Failure Avoidance	F-T	4.8	1.0	0.1	0.28	.780
		G-T	4.7	1.2			
	Uncertain Control	F-T	4.6	1.4	0.0	0.03	.974
		G-T	4.6	1.0			
	Self-Handicapping	F-T	4.7	1.7	-0.6	-1.04	.313
		G-T	5.3	1.2			
Enjoyment of Teaching	Enjoyment	F-T	6.4	1.3	.07	.15	.881
		G-T	6.3	0.8			

Note: Significance at $p < .01$.

4.3.3. Partition analysis: Gender effect on comparison of Teachers' perception of students' motivation and engagement and Teachers' enjoyment of teaching

On gender partition study, male class teachers' perception of students' motivation and engagement scores on adaptive dimension of self-belief, valuing school and learning focus/mastery orientation were higher than female class teachers. Male class teachers perceived their students to be lower on maladaptive dimension of uncertain control than female teachers (Table 24).

Though there were some differences in their perceptions of students' motivation and engagement scales, there was no significant difference between female and male teachers' ratings. On planning study dimension, male and female class teachers' scores were similar. This further supported that there was no difference in the scoring between male and female teachers in this case study research.

It seemed that male class teachers enjoyed teaching more than the female class teachers (Table 24). However, the difference in scores at teacher gender level was not statistically significant.

Table 15: Partition analysis: Gender effect on Teachers' variables (independent samples t-test)

MES dimension factor	Gender (Female=12; Male=9)	Mean	Std. Deviation	Mean Difference	t	Sig. (2-tailed)
Self-efficacy	Female	4.3	1.23	-.67	-1.327	.200
	Male	5.0	1.00			
Valuing School	Female	4.9	0.90	-.53	-1.439	.166
	Male	5.4	0.73			
Mastery Orientation	Female	4.9	0.90	-.19	-.517	.611
	Male	5.1	0.78			
Planning Study	Female	3.8	1.19	.06	.109	.914
	Male	3.8	1.09			
Tasks/Time Management	Female	3.8	1.34	.06	.109	.914
	Male	3.8	0.83			
Persistence	Female	4.3	1.07	.22	.497	.625
	Male	4.1	0.93			
Fail Avoidance	Female	4.7	1.30	-.22	-.391	.700
	Male	4.9	1.27			
Anxiety	Female	4.6	1.08	-.08	-.189	.852
	Male	4.7	0.87			
Uncertain Control	Female	4.7	1.30	.22	.424	.677
	Male	4.4	1.01			
Self-Handicapping	Female	4.8	1.66	-.58	-.909	.375
	Male	5.3	1.12			
Enjoyment of Teaching	Female	6.3	1.22	-.19	-.425	.676
	Male	6.4	0.73			

4.3.4. Correlations of Teachers' perceptions on students' perception of students' motivation and engagement and Teachers' enjoyment of teaching

Class teachers' perceptions of students' motivation and engagement was correlated to teachers' enjoyment of teaching (Table 25). On the adaptive learning dimensions, teachers' perceptions of students' mastery orientation at learning ($p < .01$) and students' persistence at studying ($p < .05$) correlated positively with teachers' enjoyment of teaching significantly. On the maladaptive learning dimension, teachers' enjoyment of teaching correlated to students' failure avoidance ($p < .05$) significantly. Thus, teachers would enjoy teaching if students are interested in learning delving deeper into their studies and persistent in their endeavour.

Table 16: Correlations of Teachers' enjoyment of teaching with students' learning dimensions

Perceptions (n=22)		SB	VS	MO	PS	TM	P	FA	An	UC	SH	ET
ET	Correlation	.205	.420	.655*	.173	.150	.431**	.470**	.405	.261	.420	1
	Sig. (2-tailed)	.359	.051	.001	.442	.506	.045	.027	.061	.240	.052	

Note: *Correlation is significant $p < .01$ level; **Correlation is significant $p < .01$ level; ET: Enjoyment of teaching; SB: Self-belief; VS: Valuing school; MO: mastery orientation; PS: Planning study; TM: Task/Time management; P: persistence; FA: Failure avoidance; An: Anxiety; UC: Uncertain control; SH: Self-handicapping

4.3.5. Class teachers' enjoyment of teaching and years of teaching

Class teachers' years of teaching were partitioned into four groups: >0 to ≤5 years, >5 to ≤10 years, >10 to ≤15 years, and >15 years. The scores on teachers' enjoyment of teaching were tabulated into these four groups (Table 26). The average means scores of each group ranged from 6.0 to 6.8.

Table 17: Means and standard deviations of Teachers' enjoyment of teaching

Years of Teaching	N	Mean	Std. Deviation
>0 to ≤5	4	6.5	.58
>5 to ≤10	5	6.8	.45
>10 to ≤15	9	6.2	.83
>15	4	6.0	2.00
Total	22	6.4	1.00

The teachers' enjoyment of teaching scores of each partitioned group on years of teaching (Table 26) were graphically plotted against scores of each of these groups (Figure 3). There seemed to be peak at about 5-10 years of teaching. However, when analysed by one-way ANOVA test (Tukey HSD), the different scores of these four groups were not statistically significant (Table 27). Overall, this observation of an improvement of teachers' enjoyment of teaching in their earlier career years seem to peak and subsequently plateau off are similar to the learning outcome studies shown by Hanushek & Rivkin (2006) and Willingham (2009).

Figure 3: Graph of correlation of teachers' enjoyment of teaching and the number of years of teaching

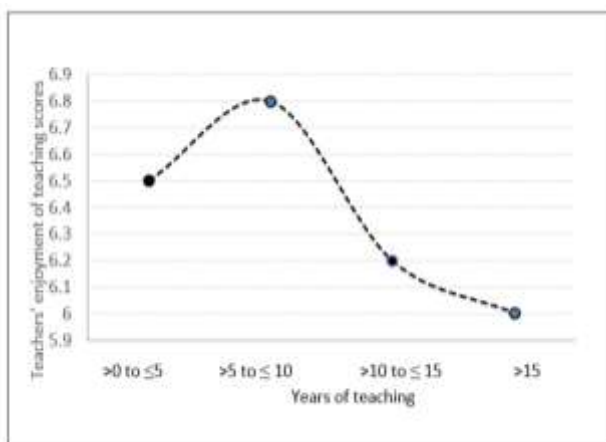


Table 18: One-way ANOVA Post Hoc Test on Teachers' enjoyment of teaching (dependent variable)

Tukey HSD (I) 4 groups Years of Teaching	(J) 4 groups	Mean Difference (I-J)	Sig. (2-tailed)
>0 to ≤5	>5 to ≤10	-.300	.972
	>10 to ≤15	.278	.970
	>15	.500	.903
>5 to ≤10	>0 to ≤5	.300	.972
	>10 to ≤15	.578	.752
	>15	.800	.664
>10 to ≤15	>0 to ≤5	-.278	.970
	>5 to ≤10	-.578	.752
	>15	.222	.984
>15	>0 to ≤5	-.500	.903
	>5 to ≤10	-.800	.664
	>10 to ≤15	-.222	.984

4.3.6. Summary of finding on Teachers' perceptions on students' motivation and engagement and Teachers' Enjoyment of Teaching

The modified MES-HS instrument consisted of 10 items each with one-question/statement. It was used by class teachers to rate the perceptions of their students' motivation and engagement.

There were differences between F-T and G-T scores on their students' rating (see Table 23) though there was no significant difference between female and male teachers at rating their students' motivation and engagement factors (see Table 24).

4.3.6.1. Class teachers' perceptions of students' self-belief/self-efficacy

The G-T of graduating classes perceived that their students have improved on their self-efficacy ($p < .01$) when compared to the F-Ts' perceptions of freshmen classes (independent samples t-test). With reference to students' self-reporting on MES-HS motivation and engagement scores, there was no significant difference in self-belief between freshmen and graduating students (see Table 17). This observation will be discussed later in Section 4.6.9.

4.3.6.2. Class teachers' perceptions of students' planning study and time management

Both F-T and G-T scores on perception on their students' planning study and time management were low among the 10-item of MES-HS questionnaire (see Table 23). Similarly, both freshmen and graduating students' self-reported low scores on planning study and time management factors (Tables 15 & 17). The implication of this observation could be useful for the CS School to target learning and addressing students' weaknesses at planning study and time management through skills improvement programmes.

4.3.6.3. Class teachers' enjoyment of teaching

The class teachers of freshmen seemed to enjoy teaching more than the graduating class teachers but scores were not significantly differentiated by their years of teaching. The teaching experience of F-T average was 10 years (range 0.3-20 years) was lower than G-T average of 13 years (8-20 years). This data correlates with studies by Hanushek & Rivkin (2006) who found that young teachers seem to have learning outcome that peaked at 5 years (see Figure 3).

The teachers' enjoyment of teaching correlated significantly with students' mastery orientation ($p < .01$), persistence at school works ($p < .05$) and students doing their school works to avoid failure ($p < .05$). In totality, when students were perceived to be learning, persistent at schoolwork and did not avoid failure, these behaviours would contribute to teachers' enjoyment of teaching. If learning outcomes could be equated to teachers' enjoyment of teaching, then this case study reflects the enjoyment of teaching that may be influenced by the number of years of teaching.

4.4. Analysis of EQi of graduating students

4.4.1. Intent of usage

This section covers the emotional quotients data that were obtained from the CS School repository, presented in an excel spreadsheet (Appendix 12). Briefly, Youth EQi: YV™ instrument was used by the CS School to measure students' EQi. Two sets of data on graduating students were available: EQi entry-point data (administered when they were freshmen) and EQi exit-point data at graduating level.

Data extraction was performed using paired t-test on EQi data at exit-point: entry-point pair to assess changes in EQi of the graduating students. Partition analysis also include independent t-test on EQi scores, gender, ethnicity and failure status when these graduating students were freshmen. Next, graduating students' EQi scale scores were correlated with the 11-scale of the MES-HS dimensions of motivation and engagement scores at exit-point.

4.4.2. Youth EQi: YV™ instrument and data analysis

According to Encyclopaedia of Applied Psychology (Spielberger, 2004) there are currently three major emotional intelligence models: Salovey-Mayer Model (Mayer & Salovey, 1997), Goleman Model (Goleman, 1998) and Bar-On Model (Bar-On, 1997; Bar-On, 2000). The CS School used the 60-item Bar-On Youth EQi: YV™ as a self-report psychometric instrument designed to measure

emotionally and socially intelligent behaviour in learners from 7 to 17 years of age. It is based on the Bar-On conceptual model of emotional-social intelligence (Bar-On & Parker, 2000). The Youth EQi: YV™ instrument comprises five scales: intrapersonal, interpersonal, stress management, adaptability and general mood and their components are tabulated (Table 28).

It is specifically designed to assess the coping skills, adaptability and well-being of children and teenagers. This product also highlights areas of positive functioning as well as areas of development. For this EQi data collection, the Likert scale-item (Table 29) was answered on a 4-point scale “very seldom true of me” (1) to “very often true of me” (4). Standard scores of 100 are considered as the average. According to Bar-On, et al., (2007), average to above average EQi scales scores suggest that the student is effective in emotional and social functioning, or most likely to be emotionally and socially intelligent.

Table 19: Summary of 60-item Youth EQi: YV™ 5 scales and 15 sub-scales (scale-components)

EQ Scales and sub-scales	Characteristics
Intrapersonal Self-Regard Emotional Self-Awareness Assertiveness Independence Self-Actualization	Self-awareness and self-expression: To accurately perceive, understand and accept oneself. To be aware of and understand one’s emotions. To effectively and constructively express one’s feelings To be self-reliant and free of emotional dependency on others. To strive to achieve personal goals and actualize one’s potential.
Interpersonal Empathy Social Responsibility Interpersonal Relationship	Social awareness and interpersonal relationships: To be aware of and understand how others feel. To identify with one’s social group and cooperate with others. To establish mutually satisfying relationships and relate well with others.
Stress Management Stress Tolerance Impulse Control	Emotional management and regulation: To effectively and constructively manage emotions. To effectively and constructively control emotions.
Adaptability Reality Testing Flexibility Problem Solving	Change management: To objectively validate one’s feelings and thinking with external reality. To adapt and adjust one’s feelings and thinking to new situations. To effectively solve problems of a personal and interpersonal nature.
General Mood Optimism Happiness	Self-motivation: To be positive and look at the brighter side of life. To feel content with oneself, others and life in general.

Table 20: Likert item and numeric score for Youth EQi: YV™

Very Seldom True of Me	Seldom True of Me	Often True of Me	Very Often True of Me
1	2	3	4

The higher the scores, the more positive the prediction for effective functioning in meeting

environmental demands and pressures. Low scores could suggest possible existence of emotional, social and/or behavioural problems. Significantly low scores in following scales: stress management (stress tolerance and impulse control) and adaptability (problem solving, flexibility, and reality testing) may indicate potential for serious difficulties in coping on a daily basis.

According to Goleman (2005), appropriate behaviour is necessary for academic development while disruptive behaviour could impede learning because the students could lack EQi. Definition of EQi includes knowing one's feeling and making good decisions in life, being able to manage one's mood and control impulses, being motivated effectively towards goals, be empathic in knowing how others feel, managing emotions in relation to others and be optimistic that build resilience and overcoming depression (Seligman, et al., 1995). In classroom, intrapersonal and interpersonal skills have impacted academic achievements of students who learnt them (Jordan & LeMetais, 2000). At the CS School, Youth EQi: YV™ was administered as paper-pencil-format to students at entry-point (freshmen level) status and exit-point (graduating level) by their class teachers. For graduating students G-S, those previously enrolled freshmen who failed uPE once was coded as G-S Px-1, and those freshmen who failed uPE twice was coded as G-S Px-2 (see Figure 2).

Presentation of Youth EQi: YV™ scale scores are: descriptive summary (mean, standard deviation), paired t-test for G-S at exit-point:entry point scores comparison at partition effect on uPE failure status (P-1x vs P-2x), partition effect on gender (paired t-test and independent t-test), partition effect on ethnicity and analysis of EQi results at entry-point and exit-point using paired t-test and independent t-test.

4.4.3. Graduating students Youth EQi: YV™

A total of 180 G-S participated in the Youth EQi: YV™ questionnaire. Their overall descriptor was tabulated (Table 30). A total of 109 G-S failed uPE once (G-S P1-x) and 71 failed uPE twice (G-S Px-2). There were 62 females and 118 male G-S in this cohort.

Table 30: Summary of graduating students' descriptors

Ethnicity	Failure status in uPE of graduating students (G-S) [†] when enrolled as freshmen		
	G-S P1-x	G-S P2-x	Total G-S
Chinese	55	25	80
Malay	44	41	85
Indian	8	5	13
Others	2	0	2
Total	109	71	180
Gender			
Female	36	26	62
Male	73	45	118

Note: [†]G-S: Graduating students; G-S P1-x: graduating students enrolled as freshmen who failed uPE once & G-S P2-x graduating students enrolled as freshmen who failed uPE on twice.

4.4.4. Comparison graduating students Youth EQi: YV™ data using paired t-test

The summary 180 G-S's EQi scales mean scores at exit-point and entry-point are tabulated (Table 31). Interpersonal scale scores were the lowest at both entry-point and exit-point.

Table 21: EQi scale scores of G-S measured at entry-point and exit-point

N=180	EQ-i Scales	Mean scores [*]	Std. Deviation
Pair 1	Intrapersonal (Exit-point)	99.8	9.61
	Intrapersonal (Entry-point)	100.6	12.99
Pair 2	Interpersonal (Exit-point)	84.3	20.35
	Interpersonal (Entry-point)	85.2	17.93
Pair 3	Stress Management (Exit-point)	97.0	12.29
	Stress Management (Entry-point)	95.8	13.50
Pair 4	Adaptability (Exit-point)	90.7	17.45
	Adaptability (Entry-point)	90.6	16.92
Pair 5	General Mood (Exit-point)	92.0	17.04
	General Mood (Entry-point)	91.4	18.48

Note: ^{*}Standard scores of "100" are considered as the average. Above average EQ-i scores suggest that the student is effective in emotional and social functioning, or most likely to be emotionally and socially intelligent (Bar-On, Maree & Elias, 2007).

EQi scales scores showed higher scores at exit-point than at entry-point in stress management, adaptability and general mood, whereas lower scores were noted in intrapersonal and interpersonal paired scales (Table 32). However, t-test on G-S's paired exit-point minus entry-point scores changes were not statistically significant.

Table 22: Comparison of G-S EQi scales on exit-point minus entry-point (paired t-test)

	EQ-i Scales on 180 students	Mean Difference	Std. Deviation	t	Sig. (2-tailed)
Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	-0.8	14.4	-0.72	.472
Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	-0.9	22.9	-0.51	.610
Pair 3	Stress Management (Exit-point) - Stress Management (Entry-point)	1.3	15.4	1.12	.264
Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	0.1	19.1	0.09	.932
Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	0.5	22.0	0.31	.758

4.4.5. Partition analysis: Failure uPE effect on comparison of EQi scales of G-S Youth EQi: YV™ data using paired t-test

The paired exit-point: entry-point EQi scores showed G-S P1-x students who failed uPE once had reported a significant improvement in stress management ($p < .05$), whereas G-S P2-x students who failed PLSE twice did not show any significant changes (Table 33).

Table 23: Partition analysis: Failure uPE effect G-S EQi scales on exit-point minus entry-point (paired t-test)

G-S	Paired t-test	EQ-i Scales on 180 students	Mean Diff	Std. Deviation	t	Sig. (2-tailed)
G-S P1-x (n=109)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	-0.8	16.1	-0.51	.613
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	-0.4	20.9	-0.19	.851
	Pair 3	Stress Management (Exit-point) - Management (Entry-point)	3.6	15.7	2.40	.018*
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	1.6	19.6	0.86	.394
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	2.8	21.3	1.36	.178
G-S P2-x (n=71)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	-0.7	11.5	-0.56	.578
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	-1.6	25.8	-0.53	.596
	Pair 3	Stress Management (Exit-point) - Stress Management (Entry-point)	-2.3	14.4	-1.32	.192
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	-2.2	18.2	-0.10	.322
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	-4.0	22.8	-1.10	.277

Note: *Statistically significance at $p < .05$.

Also, G-S P1-x stress management, adaptability and general mood scores were higher at exit-point than at entry-point (Table 33). In fact, all the five EQi scale scores of G-S P2-x students were lower

at exit-point when compared to entry-point. Though the changes in EQi for G-S P2-x were not statistically significant, this self-reported lower data observation at exit-point could imply that failing uPE twice was detrimental to G-S P2-x emotionality. This reported emotional effect was felt after three years of the CS School education (see 3.2.3). Hence it raises a point of possible contention at learning for this particular group of students in this quantitative case study.

4.4.6. Partition analysis: Gender effect on comparison of EQi scales of G-S Youth EQi: YV™ data using paired t-test on exit-point minus entry-point scores

In this gender analysis, the female G-S scored lower EQi scales on intrapersonal, interpersonal, stress management and adaptability at exit-point when compared to their entry-point scores except for general mood. Comparatively male students scored lower at intrapersonal and general mood (Table 34) on graduation. However, these changes in EQi scales scores were not statistically significant when analysed at gender partition.

Table 24: Partition analysis: Gender effect of EQi scales on exit-point minus entry-point (paired t-test)

G-S (n=180)	Paired t-test	EQi Scales	Mean Difference	Std. Deviation	t	Sig. (2-tailed)
Female (n=62)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	-1.9	14.2	-1.10	.275
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	-2.8	23.7	-0.93	.358
	Pair 3	Stress Management (Exit-point) - Stress Management (Entry-point)	-1.1	13.4	-0.63	.529
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	-2.2	15.7	-1.09	.280
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	2.3	20.5	0.88	.382
Male (n=118)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	-0.1	14.5	-0.10	.919
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	0.1	22.5	0.06	.948
	Pair 3	Stress Management (Exit-point) - Stress Management (Entry-point)	2.5	16.2	1.70	.093
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	1.3	20.6	0.70	.484
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	-0.4	22.8	-0.21	.837

Were the EQi scores at exit-point able to show the gender effect when they were graduating from the CS School? There were differences in that G-S females scored significantly higher at general mood ($p < .05$) but statistically lower at intrapersonal scale ($p < .05$) than G-S males (Table 35). This could imply that even though girls were happier than boys when they were graduating, they felt

that they had lower future career prospects than boys. This raised a possible point of contradiction as girls self-reported high general mood yet experienced low intrapersonal emotionality at the CS School graduation.

Table 25: Partition analysis: Gender effect on comparison of G-S EQi scales at exit-point (independent samples t-test)

EQ-i Scale Female (n=62); Male (n=118)	Gender	Mean	Std. Deviation	Difference	t	Sig. (2-tailed)
Intrapersonal	Female	95.1	11.57	-4.67	-2.55	0.012*
	Male	99.8	8.09			
Interpersonal	Female	79.8	14.34	-3.05	-0.85	0.398
	Male	82.9	20.84			
Stress Management	Female	99.5	11.35	3.08	1.37	0.174
	Male	96.5	11.94			
Adaptability	Female	86.6	13.8	-2.31	-0.73	0.468
	Male	88.9	17.9			
General mood	Female	94.7	13.86	7.93	2.38	0.011*
	Male	86.7	19.05			

Note: *Statistically significance at $p < .05$.

4.4.7. Partition analysis: Ethnicity effect on comparison of EQi scales of G-S Youth EQi: YV™ using exit-point minus entry-point scores (paired-t-test)

The G-S exit-point:entry-point paired EQi scale scores were partitioned to study the ethnicity effect. The EQi intrapersonal scale scores were lower at exit-point compared to entry-point for Chinese, Indian and Malay G-S (Table 36).

When compared to entry-point scores, Malay G-S scored higher on interpersonal scale than Chinese and Indian students at exit-point, while Indian G-S showed significant decrease in interpersonal scale ($p < .01$). Both Chinese and Indian students managed stress better than the Malay G-S at exit-point. Indian G-S scored significantly highest at stress management ($p < .05$).

Overall, Chinese and Malay G-S did not show any statistically significant differences in the paired exit-point: entry-point scores on any of the five EQi scales.

In sum, there were subtle differences on development of EQi scales among the different ethnic students. Indian students seemed to report a significant decrease in interpersonal scale while managing stress better. This partition study at ethnicity level is in Singapore’s context and of educational interest that borders on the meritocratic ideals in a multicultural society.

Table 26: Partition analysis: ethnicity effect on G-S EQi scales (paired t-test)

G-S	Paired t-test	EQi Scales	Mean Difference	Std. Deviation	t	Sig. (2-tailed)
Chinese (n=80)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	-0.9	16.1	-0.48	.634
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	-0.1	25.6	-0.02	.983
	Pair 3	Stress Management (Exit-point) - Management (Entry-point)	1.9	16.6	1.01	.318
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	1.0	19.7	0.44	.660
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	1.1	24.6	0.38	.704
Indian (n=13)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	-2.1	20.0	-0.38	.714
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	-17.2	19.3	-3.21	.007*
	Pair 3	Stress Management (Exit-point) - Stress Management (Entry-point)	10.1	16.3	2.23	.046**
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	3.5	21.6	0.58	.575
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	-1.5	24.6	-0.21	.834
Malay (n=85)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	-0.7	11.6	-0.53	.595
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	1.2	20.0	0.54	.592
	Pair 3	Stress Management (Exit-point) - Stress Management (Entry-point)	-0.7	13.8	-0.49	.627
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	-0.7	18.1	-0.35	.729
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	0.6	19.0	0.28	.780

Note: * Statistically significance at $p < .01$; statistically significance at $p < .05$.

4.4.8. Partition analysis: Ethnicity and failure at uPE effect on comparison of EQi scales of G-S Youth EQi: YV™ data using paired t-test

In this section, G-S Youth EQi: YV™ scales data were partitioned according to ethnicity and the uPE failure status accordingly as G-S Px-1 and G-S Px-2 (Table 37).

Chinese and Indian G-S P1-x improved on stress management significantly ($p < .05$) when compared to entry-point scores. Malay G-S Px-1 EQi scores were higher at exit-point than entry-point for all the five EQi scales with statistically significance on general mood scale ($p < .05$).

Statistically significantly lower exit-point scores were reported by Indian G-S Px-1 on EQi interpersonal scale ($p < .01$) and Malay G-S P2-x on EQi intrapersonal scale ($p < .05$). In general, G-S Px-1 seemed to score statistically significantly higher at exit-point on stress management (Indian and Chinese G-S) and general mood (Malay G-S), with an overall higher exit-point scores when compared to G-S P2-x on these three EQi scales.

Table 27: Partition analysis: Ethnicity and failure at uPE effect G-S EQi scales of exit-point minus entry-point (paired t-test)

G-S	Paired t-test	EQ-i Scales	Mean difference	Std. Deviation	t	Sig. (2-tailed)
Chinese G-S P1-x (n=55)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	-2.3	18.14	-.959	.342
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	.3	24.33	.105	.917
	Pair 3	Stress Management (Exit-point) - Management (Entry-point)	4.7	16.95	2.076	.043**
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	1.7	20.31	.611	.544
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	1.3	23.23	.401	.690
Chinese G-S P2-x (n=25)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	2.4	9.94	1.207	.239
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	-1.0	28.64	-.168	.868
	Pair 3	Stress Management (Exit-point) - Stress Management (Entry-point)	-4.5	14.01	-1.599	.123
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	-.6	18.67	-.150	.882
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	.6	27.99	.107	.916
Indian G-S P1-x (n=8)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	-5.1	16.73	-.867	.415
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	-15.9	12.28	-3.658	.008*
	Pair 3	Stress Management (Exit-point) - Management (Entry-point)	12.5	13.89	2.546	.038**
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	4.0	15.68	.721	.494
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	3.6	26.10	.393	.706
Indian G-S P2-x (n=5)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	2.8	25.63	.244	.819
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	-19.2	28.99	-1.481	.213
	Pair 3	Stress Management (Exit-point) - Stress Management (Entry-point)	6.2	20.75	.668	.541
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	2.6	31.19	.186	.861
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	-9.6	22.21	-.966	.389
Malay G-S P1-x (n=45)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	1.8	12.79	.933	.356
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	2.1	16.12	.860	.394
	Pair 3	Stress Management (Exit-point) - Management (Entry-point)	0.4	13.68	.185	.854
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	2.0	19.22	.706	.484
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	5.5	17.65	2.103	.041**
Malay G-S P2-x (n=41)	Pair 1	Intrapersonal (Exit-point) - Intrapersonal (Entry-point)	-3.1	9.54	-2.095	.043**
	Pair 2	Interpersonal (Exit-point) - Interpersonal (Entry-point)	0.1	23.47	.027	.979
	Pair 3	Stress Management (Exit-point) - Stress Management (Entry-point)	-1.9	13.81	-.893	.377
	Pair 4	Adaptability (Exit-point) - Adaptability (Entry-point)	-3.7	16.30	-1.456	.153
	Pair 5	General Mood (Exit-point) - General Mood (Entry-point)	-4.3	19.29	-1.433	.160

Note: * Statistically significance at $p < .01$; statistically significance at $p < .05$.

4.4.9. Partition analysis: Independent t-test on failure uPE on G-S Youth EQi: YV™ data

To gauge the overall effect of uPE failure on EQi scale scores, G-S Px-1 scores were compared G-S Px-2 using independent samples t-test at entry-point (Table 38) and exit-point (Table 39).

- At entry-point, the EQi scale on stress management scores of G-S Px-2 were statistically significantly higher ($p=.01$) than G-S Px-1 (Table 38).
- At exit-point, G-S Px-1 scored statistically significantly higher on EQi scales on adaptability ($p<.05$) and general mood ($p<.01$) than G-S Px-2 (Table 39).

Table 28: Partition analysis: failure at examination on G-S EQi scales at entry-point (independent samples t-test)

G-S	EQ-i Scales	Failure status	Mean	Std. Deviation	Mean Difference	t	Sig. (2-tailed)
G-S P1-x (n=109)	Intrapersonal	G-S P1-x	100.3	14.36	-0.73	-0.369	0.713
		G-S P2-x	101.0	10.75			
G-S P2-x (n=71)	Interpersonal	G-S P1-x	85.9	17.39	1.89	0.690	0.491
		G-S P2-x	84.0	18.89			
	Stress Management	G-S P1-x	93.7	13.72	-5.31	-2.615	0.010*
		G-S P2-x	99.0	12.67			
	Adaptability	G-S P1-x	91.1	16.74	1.37	0.529	0.597
		G-S P2-x	89.8	17.40			
General Mood	G-S P1-x	91.9	18.35	0.98	0.347	0.729	
	G-S P2-x	90.9	18.76				

Note: *Statistically significance at $p<.01$

Table 39: Partition analysis: failure at examination on G-S EQi scales at exit-point (independent samples t-test)

G-S	EQ-i Scales	Failure status	Mean	Std. Deviation	Mean Difference	t	Sig. (2-tailed)
G-S P1-x (n=109)	Intrapersonal	G-S P1-x	99.5	10.03	-0.75	-0.513	0.608
		G-S P2-x	100.2	8.97			
G-S P2-x (n=71)	Interpersonal	G-S P1-x	85.5	20.55	3.15	1.013	0.312
		G-S P2-x	82.4	20.16			
	Stress Management	G-S P1-x	97.2	11.96	0.53	0.281	0.779
		G-S P2-x	96.7	12.94			
	Adaptability	G-S P1-x	92.8	18.67	5.13	1.938	0.044**
		G-S P2-x	87.6	15.12			
General mood	G-S P1-x	94.6	16.40	6.70	2.613	0.010*	
	G-S P2-x	87.9	17.43				

Note: *Statistically significance at $p<.01$; **statistically significance at $p<.05$.

These data findings suggested that G-S Px-2 reported higher stress management than G-S Px-1 when they were freshmen (refer to entry-point), while G-S Px-1 expressed higher adaptability and general mood scores than G-S Px-2 when they were graduating (refer to exit-point). On

interpretation, these quantitative findings could imply that students, who experienced repeated failure at an examination and offered a second chance at the CS School, had made an attempt to control their stressful situation that may lead to learning. When students were in control of their stressful situations, learning would be possible. For some reasons, this initial (at entry-point) attempt by G-S Px-2 was not visible. It was the students who failed once (G-S Px-1) that scored higher in adaptability and general mood than the failed twice students at graduation.

4.4.10. Summary of Youth EQi: YV™ data findings of graduating students

a) The Youth EQi: YV™ data of the five scales: intrapersonal, interpersonal, stress management, adaptability and general mood of graduating students (G-S) were analysed. CS School used the emotional quotient measurements to promote the less academically inclined students to be emotionally and socially ready to learn new skills and knowledge for future career developments. Two sets of Youth EQi: YV™ data taken by G-S at entry-point and exit-point were provided by the CS School for this case study.

b) Using paired t-test on EQi scales of exit-point:entry-point pair (n=180), the changes in G-S scores were not statistically significant though the stress management, adaptability and general mood scale scores were higher at exit-point compared to entry-point. In addition, G-S scores were lower in intrapersonal and interpersonal scales at exit-point than entry-point (see Tables 31 & 32).

c) When EQi scale scores were analysed at partition on uPE failure, G-S who had failed uPE twice scored lower at exit-point compared to entry-point in all the five EQi scale scores (Table 33). This implied that failure at examination the second time had its toll on students' EQ scales subjecting them to be less in control of a stressful situation, less adaptable and less optimistic.

d) At gender level, the paired t-test at exit-point:entry-point scales scores showed no statistically significant changes. However, independent sampled t-test on exit-point scores showed that female G-S were significantly more optimistic and happier ($p < .05$) than their male counterparts though their intrapersonal scores ($p < .05$) were lower than the males (see Tables 34 & 35).

e) At ethnicity level, Indian G-S improved significantly on EQi stress management scale ($p < .05$) with decreased in their interpersonal scale ($p < .01$) at exit-point compared to entry-point (Table 36). No significant changes were seen in the Chinese and Malay G-S.

f) When EQi scale scores were treated according to G-S's uPE failure status, Chinese and Indian G-S Px-1 improved on stress management significantly ($p < .05$) with Indian G-S significantly decreased

in interpersonal scale ($p < .05$). Malay G-S Px-1 were more optimistic and happier with general mood exit-point:entry-point scores ($p < .05$). However, G-S P2-x Malay students scored significantly lower in their intrapersonal scores at exit-point ($p < .05$) especially by female Malay G-S (Table 35).

g) In general, G-S Px-1 were more optimistic, happier, and can better deal with environmental demands and develop ability to deal with stressful situations (see Tables 37, 38 & 39). Using independent samples t-test, G-S Px-1 scores on adaptability ($p < .05$) and general mood ($p < .01$) were significantly higher than G-S Px-2 (Tables 39). Thus, failure in uPE twice probably contributed to less positive academic outlook that may be detrimental to academic achievements (see Table 33). However, academic outcomes of these case study student participants were not available.

h) In summary, G-S who failed uPE twice were aware of their low confidence in dealing with self and the environmental situations. This could imply that failing examination second time would affect the students' confidence and could impede their academic achievements.

4.5. Correlations of graduating students' data from Youth EQi: YV™ instrument, MES-HS questionnaire and Academic Buoyancy survey

4.5.1. Graduating students' overall descriptor

In this case study, 116 graduating students (G-S) have both entry-point and exit-point Youth EQi: YV™ five-scale scores, 44-item MES-HS dimensions scores and academic coping scores. Therefore, Youth EQi: YV™ five-scale scores at exit-point were correlated to G-S MES-HS dimensions of motivation and engagement factors and academic coping scores. Summary of G-S descriptor of G-S with both EQi and MES-HS scores (Table 40). A total of 116/134 G-S who participated in the MES-HS and Academic Buoyancy questionnaire (see Table 11) also had Youth EQi: YV™ five-scale scores measured (exit-point).

Table 40: Summary of G-S with EQi scores and MES-HS scores

	Graduating students (G-S)		Total G-S
	G-S P1-x	G-S P2-x	
Chinese	35	19	54
Malay	28	30	58
Indian	2	2	4
Total	65	51	116
Age (years)	15 -19		
Female	26	17	43
Male	39	34	73

4.5.2. Correlations of G-S Youth EQi: YV™, MES-HS and Academic Buoyancy scores

The correlations were performed between G-S Youth EQi: YV™ five scales (intra-personal, inter-personal, stress management, adaptability and general mood) at exit-point with the 11-motivation and engagement factors and academic coping data (Table 41). There were positive and negative correlations between EQi scale scores with MES-SH dimension factors. Academic coping scale did not correlate the EQi scale scores of graduating students.

EQi scale adaptability that measures three scale-components of problem solving, flexibility and reality testing correlated positively with self-belief ($p < .05$), valuing school ($p < .05$), mastery orientation on learning focus ($p < .01$) and tasks/time management ($p < .01$).

Table 29: Correlations between G-S EQi scales at exit-point with MES-HS dimension factors and academic coping

Correlations	N=116	Self-belief	Valuing school	Mastery Orientation	Planning study	Time Management	Persistence	Anxiety	Failure	Uncertain Control	Self-handicapping	Disengagement	Academic Coping
Intrapersonal	Pearson Correlation	-0.1	-0.06	-0.065	0.062	-0.14	-0.18	-0.096	0.047	-0.207*	-0.036	0.034	-0.048
	Sig (2-tailed)	0.284	0.525	0.491	0.511	0.134	0.054	0.307	0.616	0.026	0.702	0.721	0.606
Interpersonal	Pearson Correlation	0.167	.206*	.185*	0.071	0.009	0.006	0.135	0.138	-0.043	-0.03	0.009	-0.115
	Sig (2-tailed)	0.074	0.026	0.047	0.447	0.925	0.951	0.15	0.139	0.649	0.752	0.92	0.22
Stress Management	Pearson Correlation	0.077	0.11	0.094	0.143	0.095	0.105	-0.112	-0.081	-0.185*	-0.185*	-0.205*	0.091
	Sig (2-tailed)	0.41	0.239	0.316	0.125	0.309	0.262	0.233	0.389	0.048	0.046	0.027	0.329
Adaptability	Pearson Correlation	.188*	.187*	.248**	0.163	.252**	0.116	-0.023	-0.014	-0.118	-0.013	0.1	-0.013
	Sig (2-tailed)	0.043	0.044	0.007	0.08	0.009	0.215	0.81	0.884	0.208	0.893	0.284	0.881
General mood	Pearson Correlation	.250**	.244**	.249**	0.096	0.166	0.1	0.099	0.04	-0.08	-0.067	-0.068	-0.028
	Sig (2-tailed)	0.005	0.008	0.007	0.307	0.074	0.284	0.291	0.669	0.398	0.472	0.467	0.767
MES-HS Dimension		Adaptive Cognitive			Adaptive Behavioural			Impeding Cognitive			Maladaptive Behavioural		

* Correlation is significant at the 0.05 level (2-tailed).

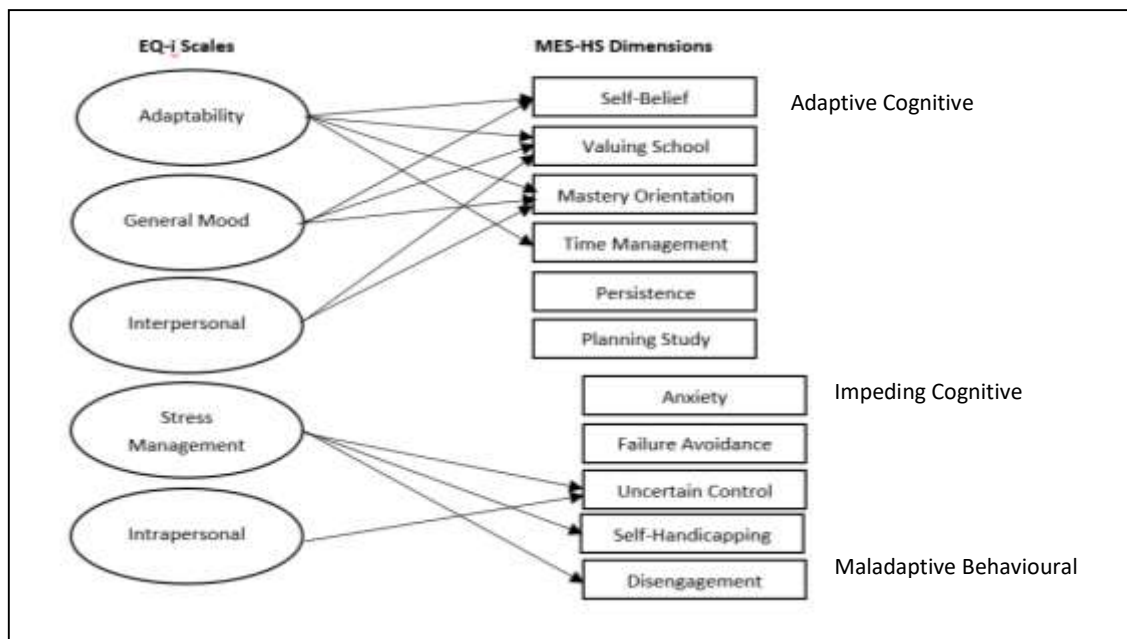
Similarly, EQi general mood scale that measures components of optimism and happiness correlated positively self-belief ($p < .01$), valuing school ($p < .01$) and mastery orientation on learning focus ($p < .01$). Also, EQi interpersonal scale measures components of interpersonal relationship, empathy and social responsibility correlated positively with valuing school ($p < .05$) and mastery orientation on learning focus ($p < .05$). These three EQi scales of adaptability, general mood and interpersonal scales were positively correlated with adaptive learning constructs. EQi stress management scale with components of stress tolerance and impulse control was correlated negatively to uncertain control ($p < .05$), self-handicapping ($p < .05$) and disengagement ($p < .05$). EQi

scale of intrapersonal scale with components of emotional self-awareness, assertiveness, self-actualization, self-regard and independence correlated negatively to uncertain control ($p < .05$). The two negative correlations EQi scales of stress management and intrapersonal implied a reciprocal relationship with MES-HS maladaptive learning constructs. Motivational dimension factors of planning, persistence, anxiety and failure avoidance, and academic coping had no significant correlation with any of the EQi scales of intrapersonal, interpersonal, stress management, adaptability and general mood.

4.5.3. Summary of finding on correlations between graduating students' Youth EQi: YV™ data and MES-HS scores

The correlation between Youth EQi: YV™ scales with MES-HS motivation and engagement dimension factors is represented in Figure 4. Students whose Youth EQi: YV™ data scores were increased in adaptability, general mood and interpersonal scales were significantly motivated cognitively in their self-belief, valuing school and mastery orientation at learning (Table 41).

Figure 4: Significant correlations of EQi scales with MES-HS dimension factors



According to Gardner (2006), out of the seven intelligences⁴⁴, intrapersonal and interpersonal relationships form the basis for the construct of emotional intelligence. Adaptability scale was correlated to time or tasks management, a behavioural motivation (Appendix 1). High EQi scale

⁴⁴ Seven intelligences are linguistic, logical-mathematical, musical, bodily-kinesthetic, spatial-visual, intrapersonal and inter-personal. Briefly, multiple intelligences have contributed to the understanding of human mind, learning and behaviour (Gardner, 2006).

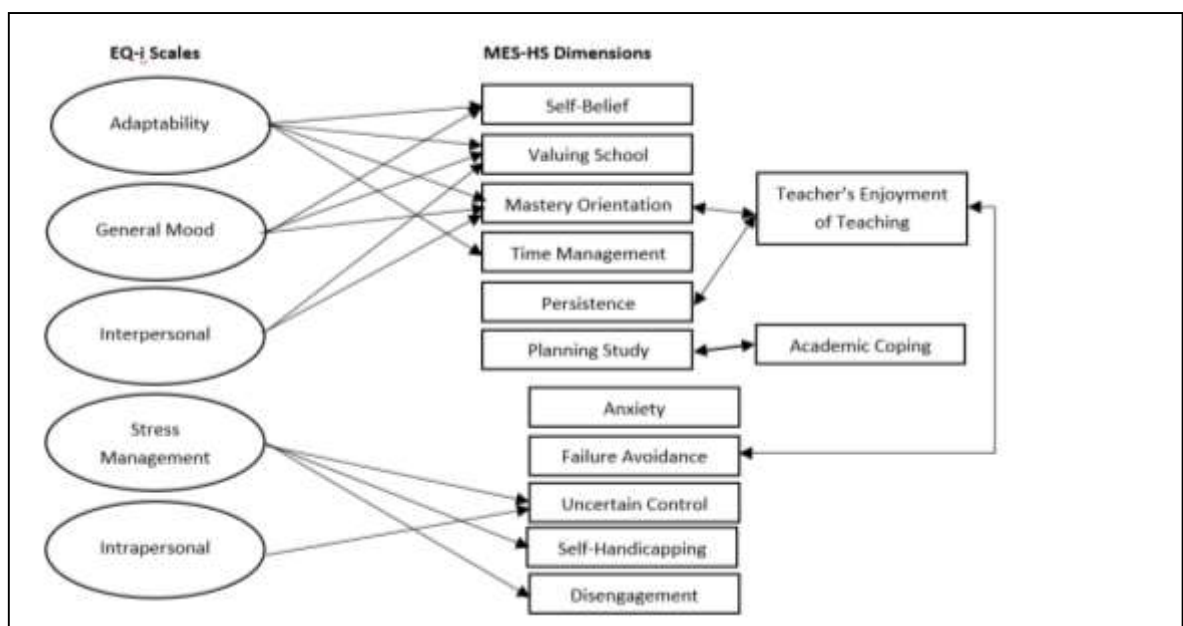
score on stress management was correlated to lower uncertain control, self-handicapping and disengagement activities. Therefore, it implies that students who had managed their stressful situations were in control of their study, manifested less self-handicapping activities and less disengaged at learning. These classroom changes would be salient in an observation study.

4.6. Integrating findings of this case study research

4.6.1. Overview

The students' 44-item MES-HS Questionnaire consists of 11 motivation and engagement dimensions (Appendix 1). Four adaptive factors of self-belief, valuing school, mastery orientation at learning and task/time management were positively correlated to students' EQi scales of adaptability, mood general and interpersonal. For students who could manage stress, they were much in control of their study, demonstrated less self-defeating behaviours such self-handicapping and being less disengaged in class (see Table 41, Figure 4). Data on academic coping, Teachers' perception of students' motivation and engagement factors together and Teachers' enjoyment of teaching were incorporated into Figure 4 (Figure 5).

Figure 5: Significant correlations of G-S EQi scales, MES-HS dimension factors and academic coping with Teachers' enjoyment of teaching



The following paragraphs examine the relevant motivation and engagement dimensions and their correlation to students' EQi scales, MES-HS dimensions and academic coping and with Teachers' perceptions and enjoyment data.

4.6.2. Uncertain control and low score on EQi intrapersonal scale

The MES-HS dimension of uncertain control factor assesses the students' uncertainty about how to do well or how to avoid doing poorly. Students are uncertain in control when they are unsure about how to do well or how to avoid doing poorly. If students are uncertain in control, they can be at risk of helplessness or disengagement at school. The 4-item uncertain control factor:

- a) When I get a good mark I'm often not sure how I'm going to get that mark again.
- b) When I get a bad mark I'm often unsure how I'm going to avoid getting that mark again.
- c) I'm often unsure how I can avoid doing poorly at school.
- d) When I don't do so well at school I'm often unsure how to avoid that happening again.

The five sub-scales of Youth EQi: YV™ intrapersonal scale are emotional self-awareness, assertiveness, self-actualization, self-regard and independence (see Table 28). As inferred here, low intrapersonal scale score conveys lack of confidence to do well academically. Thus, scoring low in intrapersonal scale equates to loss of control of one's strengths and weaknesses, to express constructively and be in control with self-confidence. Intrapersonal scale was inversely reciprocated with MES-HS scale of uncertain control factor (see Table 41).

Low scores on intrapersonal scale could imply that girls (see Table 35) and Malay students who failed uPE twice (G-S P2-x in Table 37) might need help in developing their self-confidence in learning. Since low intrapersonal scale score denotes not achieving well, it is also probable that it could be related to low self-confidence on expressing one's ideas. In other areas of studies, positive attitudes of intrapersonal scale have been linked to formal writing (Khademi & Ahangari, 2011) and females have been shown to more expressive and aware of their feelings than the males (Barrett, Lane, Sechrest, & Schwartz, 2000). In this way, intrapersonal scale expression could be linked to gender effects. In addition, study has shown that acquiring self-confidence early is related to successful careers later in life (Holahan & Sears, 1995). Hence, self-control is important for success in life and intrapersonal scale may affects girls and boys differently.

Additionally, low intrapersonal scale experienced by students who failed uPE twice (same examination) seemed detrimental to students' self-actualisation and assertiveness. Perhaps implication to suggest some changes to educational structure might help students to ameliorate the psychological trap of failing. Should students who failed this important examination be encouraged to sit for the uPE again by retaining another year? Some students re-sit uPE and passed had managed to get back to mainstream schooling. If retention has negative implication, could there be a possibility of building an extended curriculum at the CS School to help those aspire to re-sit the uPE while studying in this specialised school? Perhaps, a counselling

programme that could help students learn to deal with failure in an examination in a constructive and adaptive manner, enabling ultimate success in the testing process?

4.6.3. Planning study

MES-HS dimension of planning factor has the highest inter-item correlation with academic coping (Table 16). This finding could suggest that teaching students on planning would improve their daily coping at classroom level. Important observation is planning factor was students' self-reported lowest score in the MES-HS questionnaire (Table 15) and it was rated the lowest score by their class teachers (Table 23).

MES-HS questionnaire on planning assesses how much students plan their schoolwork, assignments, and study and how much they keep track of their progress as they are doing them.

The MES-HS 4-item is:

- a) I get it clear in my head what I'm going to do when I sit down to study.
- b) Before I start an assignment, I plan out how I am going to do it.
- c) I try to plan things out before I start working on my homework or assignments.
- d) I usually stick to a study timetable or study plan.

Planning motivational dimension factor correlated with academic buoyancy scale of coping with everyday live (Figure 5). Hence intervention to teach skills on planning is recommended because skill deficits in classroom instruction could perpetuate failures (Kaur & Ghani, 2012, p. 83). These could be done in manageable size and quantity to ensure the learning journey be as successful (Skinner, Pappas, & Davis, 2005). This case study data analysis showed that the adaptive behaviour factor planning was not correlated to any EQi scales (Figure 5). This prompts the next question on whether planning and time management both resource intensive to the students: are less academically inclined students willing to invest and change their belief systems that the efforts would be meaningful?

4.6.4. Persistence

MES-HS dimension of persistence factor a positive adaptive factor in learning was not correlated to any the EQi scales. The inter-item score was the lowest in MES-HS dimension (Table 12). The 4-item persistence scale examine how much students keep trying to work out an answer or to understand a problem even when that problem is difficult or is challenging. If students are persistent they tend to keep going over schoolwork until they understand it, spend time trying to understand things that do not make sense straightaway, and keep working at a task even when it is difficult. The four statements are:

- a) If I can't understand my schoolwork at first, I keep going over it until I do.
- b) When I'm taught something that doesn't make sense, I spend time to try to understand it.
- c) I'll keep working at difficult schoolwork until I've worked it out.
- d) If my homework is difficult, I keep working at it trying to figure it out.

The above asked students on time and efforts to work hard at solving the schoolwork. Did they have the resources to meet the demand of studying? Data showed that Indian students scored overall highest at persistence factor (Table 19) and were more persistent than the Chinese or Malay students though the effects were not statistically significant (Table 20). Teachers would enjoy teaching if their students were persistent in their study (Table 25). Perhaps the students' emotional state impeded their abilities to overcome the perceivably difficult homework, therefore they were not energised to work on it. Alternatively, teach students that efforts are internal and worth the time and energy to attain academic rewards (Willingham, 2009). Therefore, it is imperative to assist students to overcome their stress level so they would be less disengaged, less attributional to self-handicapping activities (Table 16) and be in control of their learning (see Table 41 & Figure 4).

4.6.5. Disengagement

MES-HS dimension of disengagement factor had the lowest Cronbach's alpha, item mean and inter-item correlation among the 11-item MES-HS dimensions' scales (see Table 12). This maladaptive motivational factor was not correlated to any of the five EQi scales. Low MES-HS disengagement score is a good indication of engagement. However, low inter-item correlation value need further analysis of the item statements.

The MES-HS disengagement scale assesses feelings and thoughts of giving up in particular school subjects or school generally. Students high in disengagement tend to accept failure and behave in ways that reflect helplessness or believe there is little or nothing they can do to avoid failure, or attain or repeat success. The 4-item statements are:

- a) Each week I'm trying less and less.
- b) I don't really care about school anymore.
- c) I've pretty much given up being involved in things at school.
- d) I've pretty much given up being interested in school.

The disengagement statements contain words such "don't really care" (b), and "given up" (c & d) evoke emotions of hopelessness. The students' response as shown by the inter-item correlation matrix (Table 42) seems to indicate that statements (c) and (d) are similarly answered as compared to (b) and (c). For this study, these statements are strong reminder for the students studying at the

CS School because they were told that it would be their second chance at schooling for them (CS, 2014).

Table 30: Inter-Item correlation matrix for disengagement scale

	Disengagement (a)	Disengagement (b)	Disengagement (c)	Disengagement (d)
Disengagement (a)	1.000			
Disengagement (b)	.196	1.000		
Disengagement (c)	.155	.095	1.000	
Disengagement (d)	.139	.165	.320	1.000

Disengagement assesses components of students’ acceptance of failure that may reflect their helplessness and failure avoidance. It is possible for the CS School students to employ ways to preserve their self-worth. The failure dynamic play-out by students to overcome the feeling of shame with excuses that would minimise teachers’ reprimand. In the event of failure, students prefer low-effort explanations to low ability explanations. This attributional behaviour perceives low-ability predict future failure while failure does not necessarily be due to low ability (Weiner, 1992). Such long-term behaviour is self-defeating and would lead to disengagement from learning.

In totality, the students in this case study had interpreted the persistence questionnaire in two different formats as shown by the inter-item correlation matrix (Table 42). This problematic interpretation and apparent multifaceted difference on the 4-item persistence factor could only be affirmed by the students in a qualitative study.

4.6.6. Self-Handicapping

MES-HS dimension of self-handicapping factor inter-item correlated positively with disengagement at the highest value of .512 (see Table 16). The MES-HS self-handicapping scale refers to students’ tendency to do things that reduced their chances of success at school. Examples are putting off doing an assignment or wasting time while they are meant to be doing their schoolwork or studying for an exam. If students self-handicap they do not try hard at projects or difficult schoolwork, do not study very hard before tests, and do other things when they should be doing their homework. The statements are:

- a) I sometimes don’t study very hard before exams so I have an excuse if I don’t do so well.
- b) I sometimes do things other than study the night before an exam so I have an excuse if I don’t do well.
- c) I sometimes put assessments and study off until the last moment so I have an excuse if I don’t do so well.
- d) Sometimes I don’t try hard at assignments so I have an excuse if I don’t do well

The correlation items suggested that students' disengagement referred to the self-handicapping behaviours that could be portrayed by students' strategies of pessimism such as withdrawing effort to protect oneself from demonstration of low ability as preservation in the self-worth theory (Covington & Omelich, 1985) and withdrawing/disengagement from classroom activities thus missing out on learning (Skinner & Kinderman, 2008).

In sum, self-handicapping behaviours are activities exhibited by students before the impending events such as producing quality work (Martin, 2010). Such attributional behaviours are self-defeating and usually visible in classroom. However, self-handicapping is reciprocal to stress management. In other words, when students were less stressed they would portray learning and be less disengaged.

4.6.7. Anxiety

MES-HS dimension of anxiety and failure avoidance factors were two maladaptive motivational and engagement factors that were not correlated to any of the five EQi scales (Figure 5). The MES-HS anxiety scale assesses the feeling of being nervous and worrying. Feeling nervous is the uneasy or sick feeling students get when they think about their schoolwork, assignments, or exams/tests. Worrying is their fear about not doing very well in their schoolwork, assignments (projects) or tests.

The item anxiety statements are:

- a) When exams and assignments are coming up, I worry a lot.
- b) I worry about failing exams and assignments.
- c) When I do tests or exams I don't feel very good.
- d) In terms of my schoolwork, I'd call myself a worrier.

Anxiety scores in students' MES-HS dimensions were statistically significant in ethnicity partition analysis. The Malay students seemed to be significantly ($p < .01$) more anxious than the Indian students (Table 20). There are various interventions available to improve academic performance such as by reducing anxiety level (Hembree, 1988), help students fight test anxiety (Teo, 2008), cope with examination and failures (Doron, Stephan, Boiche, & Le Scanff, 2009), writing away examinations worry (Ramirez & Beilock, 2011), overcoming subject-domain specific anxiety e.g. in mathematics (Luo, et al., 2014) and seek medical help when needed (Lo, 2013).

In this case study girls seemed to score higher at anxiety than boys though this difference was not statistically significant (Table 18). However, other researchers have demonstrated that girls were

significantly more anxious than boys (Martin, 2003; Farooqi, Ghani, & Spielberger, 2012). Perhaps, at the CS School, both boys and girls having failed uPE may share similar experience, hence similar levels of anxiety.

Perhaps the focus on grades and competitiveness to pass high-stakes examinations need a re-look. School should incorporate the components of failure in examination by teaching less academically inclined students on how to treat their emotional pains (Seet, 2012), to learn the buoyancy of academic achievement (Martin, al et., 2013) and cope positively in failure situation (Doron, et al., 2009). Yet, results from PISA 2003 have shown that East Asian students tend to have a combination of high performance and high anxiety in mathematics (Lee, 2009). Nevertheless, 'greater mathematics anxiety is associated with a 34-point lower score in mathematics – the equivalent of almost one year of school' according to OECD analysis of PISA 2012 data (OECD, 2013, p. 88). In summary, high anxiety is associated with lower academic outcome.

4.6.8. Failure avoidance

The maladaptive MES-HS failure avoidance factor was not statistically significantly linked to any EQi scale. Failure avoidance assesses the main reason students do their schoolwork is to avoid doing poorly or to avoid being seen to do poorly. If students have an avoidance focus, they tend to do their schoolwork mainly to avoid getting bad marks, to avoid people thinking they cannot do it, and to avoid disappointing their parents or teachers. The 4-item scale:

- a) Often the main reason I work at school is because I don't want people to think that I'm dumb.
- b) Often the main reason I work at school is because I don't want people to think bad things about me.
- c) Often the main reason I work at school is because I don't want to disappoint my parents.
- d) Often the main reason I work at school is because I don't want my teacher to think less of me.

This failure avoiding situation or avoidance motivation is an aversive event implicating affective and behavioural processes such as adopting strategies to avoid negative outcome by selecting easy tasks so failure is avoided or withdrawing effort to protect oneself from demonstrating low ability regulating process of what must be done that is externally forced or internally (Covington & Omelich, 1985; Turner, et al., 2002). Some of the antecedents to failure avoidance are fear of failure, parents' worry, parents' negative feedback, self-evaluation, implicit theories of entity belief and anxiety (Elliot & McGregor, 2001).

Yet optimism may have a role in reducing the negative effects of avoidance motivation as it eases threat appraisals, anxiety and disengagement, and achieving success or avoiding failure in creativity (Icekson, Roskes, & Moran, 2014). In fact, the girls in the graduating class were significantly more optimistic and happier (Table 34) but they were also aware of their lower self-confidence in their future careers compared to the boys. Working on acceptance of the situation, the process of self-navigation in failure avoidance is resource-depleting and could be exhaustive that contradict students' learning (Elliot, et al., 2013).

Indeed, class teachers rated avoiding failure to please teachers/family members as positively and significantly ($p < .05$) to students' perception of motivation and engagement with Teachers' enjoyment of teaching (Table 25). The 1-item class-teachers' perception on their students' on failure avoidance was "A number of students in my class mainly do their schoolwork to avoid failure or disapproval from parents or teachers". In other words, the class teachers' notice of their students' failure avoidance motivation and this seems to correlate to their enjoyment of teaching.

4.6.9. Self-belief of students' self-report and teachers' perception

Class teachers' perception of their graduating students' academic self-belief was statistically significantly higher than class teachers' perception of their freshmen (Table 23). However, the difference in self-belief scores reported by graduating students and the freshmen were not statistically significant even though the graduating students scores were higher than the freshmen (Table 17). Perhaps teacher efficacy beliefs and their conceptions of student engagement could be mediated by personal and contextual elements as shown by a qualitative study on teacher efficacy and confidence in mathematics teaching (Bobis, Way, Anderson, & Martin, 2016). Nevertheless, according to meta-study, students evaluated their teachers accurately on their excellence in teaching (Hattie, 2009, p. 35). Teachers are revered and are not being challenged by Asian students in a cultural study (Liem, et al., 2009). In this case study, students were not asked to evaluate their class teachers' effectiveness in teaching.

There seemed to a disconnect on the class teachers' perception of significant improvement on graduating students' self-belief with students' self-reported self-belief MES-HS dimension 4-items mean scores. Perhaps a glean at the self-belief item statements of both class teacher's modified MES-HS instrument and students' MES-HS on self-belief dimension would explain this discrepant observation. The correlation data linked MES-HS dimension factor self-belief to EQi scales on adaptability and general mood (Figure 4).

The following paragraph attempt to explain teachers' item and students' 4-self-report on self-belief. Teachers' perception of students' self-belief 1-item was "Most students in my class believe they can do a good job on their schoolwork".

The student MES-HS on 4-item on self-belief scale related to students' belief and confidence in their ability to understand or to do well in their schoolwork, to meet challenges they face, and to perform to the best of their ability. The 4-item statements are:

- a) If I try hard, I believe I can do my schoolwork well.
- b) If I don't give up, I believe I can do difficult schoolwork.
- c) If I have enough time, I believe I can do well in my schoolwork.
- d) If I work hard enough, I believe I can get on top of my schoolwork.

The MES-HS 4-items on self-belief have components of self-confidence, effort and persistence. The graduating students did not rate highly over their self-confidence to do their schoolwork well and probably unable to persevere over difficult schoolwork. There were no significant differences on self-belief scores between the graduating students and freshmen. Both freshmen and graduating students probably did not believe they could do well in their schoolwork, therefore might not have invested time and effort to persist. At the CS School, students studied numeracy and literacy subjects in addition to values acquisition and vocational subjects.

Self-belief has been contextualised in subject-specific or domain-specific, for example, girls scored higher on reading but lower on science when compared to boys (OECD, 2015). A history of failure may affect a low self-belief on a given task (Pintrich & De Groot, 1990). These students' prior mathematics scores at uPE were ungraded (i.e. very low marks). Would the emotional self-reactions on low marks in mathematics prompted them to score low on 4-item self-belief scale? Still on the mathematics, low-achieving students seemed to have 'limited working capacity that prevents them from holding amounts of information at one time' and needed various memory strategies to improve their performance (Kaur & Ghani, 2012, p. 161). In addition, disadvantaged students' (from low SES families) scores were at the low end of the PISA results spectrum (Lee, 2009).

Compounding this multi-factorial situation is students with fixed entity mindsets would manifest low confidence at subsequent similar task and be equally affected by difficult tasks, thus the low-rated self-belief scores (Dweck, 2008). A qualitative study would be helpful to ask the students on their interpretation of their self-belief and how these would impact the 4-item statements. Hopefully, this would answer the real-world interpretation of belief in oneself at learning after

their twin failure of examination(s) and the failure to continue at mainstream schooling. This would add meaning to students' and their class teachers' perception on their efficacy at learning.

4.6.10. Teachers' enjoyment of teaching

Teachers' enjoyment of teaching Likert scale scores for class teachers of freshmen and graduating students are 6.4 and 6.3 respectively (Table 24). Martin (2006a, p.82) reported a mean of 6.2 for primary school teachers and 6.1 for secondary school teachers (Appendix 13). At comparison, the Singapore teachers seemed to enjoy teaching more than the Australian cohorts. This exercise remains academic because of the other contentious differences in educational systems and values variation of the collective Asian culture versus the individualistic Australian culture (Hofstede, 2001). Nevertheless, there was no gender difference at Teachers' enjoyment of teaching for both Singapore teachers (Table 24) versus Australian teachers.

In this case study, class teachers self-reported on their enjoyment of teaching. Data showed that there was a trend on enjoyment of teaching that correlated with the teachers' years of teaching and seemed to peak at around 5-10 years (Figure 3). Nevertheless, the finding was not significant when years of teaching was correlated with Teachers' enjoyment of teaching using the one-way ANOVA test. A computerised data evaluation that purported to measure teacher quality by using student achievement gains to calculate teacher quality, found that teacher quality seemed to peak at 5 years of experience (Hanushek & Rivkin, 2006). Definitely gains in teacher effectiveness is associated with steep learning in the initial years but continue to be significant as teachers reach their second or third decades of their careers (Kini & Podolsky, 2016).

Teacher quality has been assessed based on perception of students' input that clarity in articulating as a success criterion and students' achievement. Teacher's enjoyment is described as teacher's experience of "flow" (Csikszentmihaly, 1990). The result of teacher enjoyment-student enjoyment has been positively linked and this mediates teachers' enthusiasm (Frenzel, Ludtke, Goetz, Pekrun, & Sutton, 2009). Meta-study shows that teacher-student relationship is ranked the highest at influencing academic achievement (Hattie, 2009). This classroom engagement starts with students' understanding at learning (Newton, 2000) that continues to improve with students' reasoning and thinking (Darby, 2005). When teacher's enjoyment is "confirmation of good work" (Bredmar, 2013), teaching experience will continue to be positively associated with student achievement gains throughout a teacher's career.

In this case study, class teachers perceived their graduating students to achieve high scores in mastery orientation, persistence and significantly highest scores on self-belief but low on planning and task/time management motivation and engagement dimensions. In terms of impeding and maladaptive dimensions, the class teachers perceived students' anxiety, self-handicapping, and failure avoidance as relatively high. These findings were similar to Martin's (2006a) data that also show high scores on self-efficacy, mastery orientation and persistence, and low scores in planning and task management. Though teachers' confidence was not measured in this case study but in Martin's study (2006a), perceptions of students' persistence was strongly correlated to teachers' confidence in teaching.

Class teachers' enjoyment was correlated to students' mastery orientation at learning, persistence and failure avoidance (Figure 5). Because students were experiencing difficulties at planning study and time management, these could present as evidence that they were studying just enough to avoid failure. This could imply that help in the form of relevant skills acquisition would be beneficial to the less academically inclined students in addition to influencing them to believe that learning is malleable (mindset change), and persuading them to believe that persistence at learning is worthwhile.

4.6.11. Failure at examination: Youth EQi: YV™ data

Correlation data showed that graduating students (G-S) who previously have failed high-stakes uPE twice (G-S Px-2) were less competent than those who failed once (G-S Px-1) using paired t-test on exit-point:entry-point pairs in all five EQi scales (Table 33). When compared using the EQi exit-point scores, G-S Px-2 are less optimistic and less adaptable (Table 38), as versus EQi at entry-point when G-S Px-2 self-reported statistically significant at managing stress better than G-S Px-1. Did these students who failed twice need more help at learning in a sustainable way than students who only failed once?

Other researchers have noted that academically successful students scored higher than unsuccessful students in subsets of interpersonal ability, stress management and adaptability (Parker, Summerfeldt, Hogan, & Majeski, 2004). Thus, the academically unsuccessful students who failed the examination once were better at EQi scales on stress management, interpersonal, adaptability and general mood (see Figure 4) than those who experienced repeated failures.

At ethnicity level, paired t-test exit-point:entry-point pair analysis showed Indian and Chinese G-S Px-1 had significant improvement in their EQi stress management scale, Malay G-S Px-1 had

significant improvement in their general mood scale, while Indian G-S Px-1 have decreased interpersonal scale and Malay G-S Px-2 have lower intrapersonal scale score during their schooling at the CS School (Table 36). Such findings could be interpreted to suggest that acquiring emotional competencies across the five EQi scales were not equivalent across the ethnic groups. In general terms, repeated failing at an examination affected the students' confidence in self-awareness, happiness and coping with the difficult situations.

4.6.12. Failure at examination: MES-HS data

This section summarises the freshmen (F-S) motivation and engagement dimension factors and academic coping scores. Freshmen who failed uPE twice (F-S Px-2) were significantly more mastery orientated at learning focus and less disengaged than freshmen who failed uPE once (F-S Px-1) (Table 21). This data imply that repeated failure motivated the freshmen to focus on learning and be engaged in classroom.

4.6.13. Integrating Youth EQi: YV™ data with MES-HS dimension factors and academic coping scores

These paragraph summaries the triangulation of this case study data for information to user of EQi scales in similar situations. The five EQi scales of G-S at exit-point were correlated with the 11-scales of motivation and engagement dimensions in an attempt to suggest the findings. From partition data, intrapersonal scores were decreased in girls when compared to boys yet reported a relatively better general mood scores than boys (Table 35). As the intrapersonal score measures self-actualisation and future career prospects, it could imply that the curriculum at the CS School did not match the girls' preference yet they were happy to be graduating (Table 43). For probably the same reason, girls did not cope as well as the boys (Table 18). Low score intrapersonal score was correlated negatively to uncertain control that is maladaptive, impeding cognitive to learning.

The EQi interpersonal scale was significant statistically at ethnicity level and it correlated positively to adaptive learning dimension of valuing school and mastery orientation. In this case, despite the low EQi interpersonal scale scores, students managed to improve on their learning. Overall, low interpersonal scale score probably referred to the social aspects of school life.

The EQi stress management scale correlated negatively to maladaptive learning dimension factors of uncertain control, self-handicapping and disengagement. In this reciprocal relationship, a high score in stress management would be indicative of striving to overcome the negative features of

uncertain control and be engaged in schoolwork. Data showed that freshmen who failed uPE twice rated significantly higher stress management scores than those who failed uPE once, yet they did not score on adaptability and general mood on graduating. This could mean that initial attempts were not being successful at overcoming the negative effects of uncertain controls and attributional behaviours. Remedial interventions are implicated.

The EQi adaptability scale was correlated positively to four out of six positive adaptive learning dimensions in factors of self-belief, valuing school, mastery orientation and time management (see Figure 1). Similarly, EQi general mood correlated to those of adaptability except for time management. The two behavioural components on planning study and persistence are classroom interventions in remedial programmes or skills therapy and adhering to curriculum.

Table 31: Correlation of EQi scale scores and its impact on learning

*EQ-i scales	Summary of data	Learning dimension	Low EQ-i scale: impact on curriculum, remedial, social	Correlating EQ-i scales to learning dimension
Intrapersonal	Tables 35, 37, 41	uncertain control	curriculum	Negative
Interpersonal	Tables 36, 37, 41	valuing school, mastery orientation	social	Positive
Stress Management	Tables 33, 38, 41	uncertain control, self-handicapping, disengagement	remedial	Negative
Adaptability	Tables 39, 41	self-belief, valuing school, mastery orientation, time management	curriculum, remedial	Positive
General mood	Tables 39, 41	self-belief, valuing school, mastery orientation	curriculum, remedial	Positive

Note: *Failure in examination likely decreased in EQ-i scales (Table 33, 37, 38).

Chapter 5. Discussion and Implication

5.1. Overview

A summary of the data on students' Youth EQi: YV™, students' MES-HS scale, students' academic coping scale, Teachers' perceptions of students' motivation and engagement and Teacher's enjoyment of teaching surveys is provided in Figure 5.

The following paragraphs will answer the main research question and associated sub-questions:

Main: To what extent are cognitive behavioural changes used to negotiate environmental demands for academic engagement after three to four years of the CS School schooling?

a) What are the motivational changes in cognitive and behavioural factors of the students?

b) To what extent do the less academic students negotiate academic buoyancy in their resilience to overcome academic failure?

c) Which aspects of the cognitive and behavioural dimensions that class teachers perceived their students' academic engagement (entry-level students compared to graduating cohort)?

d) To what extent is student motivational academic outcome related to teachers' enjoyment of teaching?

The approach to data delineation includes a general overview and partition analysis based on gender, failure status of an examination (uPE) and ethnicity (Chinese, Malay, Indian). The CS School students had failed the upper primary school examination (uPE). Participants of this study comprised two cohorts of students: entry-point freshmen and exit-point graduating students.

To recap, students were enrolled in a 4-year or 3-year course with foundation subjects of English, Mathematics and info-communication technology. Graduates specialised in one of the following skill certificates: mechanical services, facilities services, hospitality and retail services. For some, educational progression meant entering a Technical College that would eventually lead them back to mainstream path of university education (STATs, 2016).

At the CS School, learning is centred on value-based character education with a focus on preparing students for vocational careers in future. Teachers are required to reach out to the students in social-emotional areas to help them with personal and family matters. The answers to the research questions is a convergence of students' Youth EQi: YV™, students' MES-HS scale, students' academic coping scale, teachers' perceptions of students' motivation and engagement and enjoyment of teaching.

5.2. Students' cognitive and behavioural changes

5.2.1. Socio-emotional learning

According to MOE, the definition of social and emotional learning (SEL) is an umbrella term that refers to students' "acquisition of skills to recognise and manage emotions, develop care and concern for others, make responsible decisions, establish positive relationships, and handle challenging situations effectively" (MOE, 2016d). School-based initiative targets character development (Berkowitz & Bier, 2004) constitutes 40% of the CS School curriculum. Its multi-components include classroom management, curricular, social-skill training, parent involvement, and/or school reform basics with school as a caring community.

A quality character education is associated with school leadership, academic gains for students, effective form of primary prevention and staff development for effective implementation. In Singapore, character education is taught with citizenship (MOE, 2014b) and it adopts a whole-school approach. At the CS School, it aims to develop values, attitudes and personal qualities to enable their students to lead fulfilling lives. Activities such as sport participation and arts appreciation are opportunistic structure to teaching, training, action and affirmation of character education ideals.

To assess socio-emotional competencies, students' emotional quotients were measured using 60-item Youth EQi: YV™ instrument at two-timed points: entry-point and exit-point. SEL core competencies of cognitive, affective and behavioural could be acquired via interventions such as cognitive-behavioural therapy (e.g. study skills and time management) and development of social-emotional competencies (e.g. awareness of emotions in self and others, self-management and interpersonal relationship skills) in school curricula that relate positively to academic achievement/test-scores (Zins, et al., 2004; Wang, et al., 2012). The CS School student-centred programmes instil values (such as confidence, persistence, intrapersonal and interpersonal skills) by articulating specific themes to capture character elements that convey an overall sense of purpose for attending school. These culminate in an overall environmental climate and school norms (Comer, 2003; Cheong, 2012) in a whole-school approach.

Of the five EQi scales, stress management had the most significant impact to the CS School students. Their self-reported data on stress management was negatively correlated to the maladaptive motivation and engagement dimension factors of uncertain control, self-handicapping and disengagement. It means that if students could control their stressful situations

of negative emotions as a consequence of an examination failure, this would be applicable in any similar situations in other schools. The following paragraphs are the highlights of this case study.

5.2.2. EQi stress management scale

The sub-scales of stress management are stress tolerance and impulse control. The scale measurement assesses how the students manage and control their emotions constructively. When applied to students who have a failed examination, it could be related to inadequate planning and insufficient effort invested. This case study showed both students and teachers' perceptions that planning and time management as two of weaker behavioural factors the MES-HS dimensions.

Emotions such as anxiety, depression and self-harm were reported in children who received poor results in a national examination (Teng, 2016). Many stress points such as parents putting their children through repeated grade level hoping that their children would get better grade after another year retention, the lack of appeal to the Ministry on passed result cut-off point by a small amount and miserable skills training for the special need children have been cited in the Singapore education system (Chua, 2017). Recent interests on levelling the academically weak students have resulted in reports on how and what to do to help these students (Ng & Li, 2014; Wang, Teng, & Tan, 2014; Teh, 2014). Despite initiatives such as providing multiple pathways in the education system and suggestion such as to include curiosity, creativity and leadership programmes, parents and students are still concerned with the summative national examinations (Nayak, 2016).

It is no wonder that the CS School children experienced such tremendous stress at coping in school and probably imagined their self-worth being defined by how well they performed academically. The CS School students who been involved in the school programmes such as Equine Assisted Learning had learned how to deal with horses' temperament. As a result, these CS School children have developed high level of self-discipline on stress control leading to attitude and self-esteem improvement (CS, 2014). There should be a plan to track how well the students are responding to such programmes that reduce their stress level and improve their self-control. Therefore, reducing attributional activities that would lead to improvement on engagement at learning.

5.2.3. Academic Buoyancy

Academic coping correlated to both adaptive MES-HS dimensions and negatively to the maladaptive dimensions of anxiety, failure avoidance, uncertain control, self-handicapping and disengagement factors (Table 16). Academic coping did not correlate any of the EQi scales of

intrapersonal, interpersonal, stress management, adaptability or general mood. These case study findings are similar to Martin, et al., (2013) that shows a reciprocal relationship between psychological risk factors (academic anxiety, failure avoidance, uncertain control) and academic buoyancy. Thus, these case study findings could imply that reducing the psychological risks would help the students deal more effectively with adversity in school life. Therefore, by increasing academic resilience, students would be more proficient at learning especially in planning study (Martin, et al., 2010). In this case study, boys coped significantly better than girls (Table 18).

5.2.4. Ethnicity

There were subtle cultural differences on adaptation and learning among the main ethnic groups. Failure affects students differently and may vary according to ethnic groups (Aronson, et al., 1998). From the paired t-test analysis on exit-point:entry-point scores, the Chinese and Indian Px-1 students self-reported improved stress management scores while Indian students self-reported significantly decreased interpersonal scores, and Malay students self-reported improved general mood (Table 37). Only Px-2 Malay students self-reported decreased intrapersonal scores on graduation. Generally, the Malay students had higher anxiety scores than the Chinese or Indian. Students should be aware that there are programmes that have been successful at anxiety management (Sapp, 1999; Lee, 2003 & Teo, 2008) and understand Covington's self-worth theory on failure as a way to improve learning through mastery orientation and work towards success instead of employing failure-avoidance or failure-accepting strategies.

In the comparative analysis, the Malay students seemed to enjoy studying at the CS School. The EQi scale scores were higher at exit-point than entry-point (Table 37) and significantly higher mastery orientation scores among the three ethnicities (Table 20). The Indian students were more engaged (Table 20) but might not enjoy schooling as shown by the low interpersonal scale. The Chinese students managed being in control with improved stress management. Interpersonal scale or relatedness has an energising function on the self, creating positive affect and mood. The eventual intrapersonal energy gained from interpersonal relationships motivate the need to belong. Apparently, when the need for belongingness is fulfilled it produces positive emotional responses and are said to drive students' achievement behaviours, including participation and self-regulation (Baumeister & Leary, 1995).

The contributions of interpersonal skills to academic outcomes are indirect. Therefore, it tends to assume a slightly lower priority when developing interventions for students experiencing learning

or academic difficulties. In sum, schools should be aware that social skills are important in student engagement (Diperna, 2006). The case study findings reveal that students from different cultural communities may experience and respond to learning differently and, therefore, teachers should be aware of the cultural contexts in which learning takes place.

More research is needed to understand why the Indian students' scores on interpersonal decreased significantly during schooling and why Malay students who failed uPE twice scored significantly lower on intrapersonal scale at exit-point when compared to their entry-point scores (Table 37). Meanwhile, there is continued assurance that the Malay students have progressed and that MOE is working with other community self-help groups to further their educational development (MOE, 2012b).

5.2.5. Gender

At exit-point, partitioned data showed girls' scores being significantly lower on intrapersonal scale but higher on general mood scale when compared to boys' scores (Table 35). In addition, girls seemed to be less resilient than the boys at coping academically on a daily basis (Table 18). Their intrapersonal scale indicated that they were less confident about their future than the boys, yet they were happy and optimistic to be graduating.

Drawing from skills acquisition at the CS School, the male-related courses such as mechanical services and facilities services, perhaps were not so compelling for the girls. The interpretation of the gender differences on learning focus could reside on subject domains and have been stereotyped much to the chagrin of students' learning. This gender gap in education refers to the ratio of girls and boys passing examinations in particular subjects. The size and nature of the gap differed according to the subject (Wiliam, 2000). There is a noticeable gap in favour of boys in Science and Technology while there is a gap in favour of girls in Languages and Humanities subjects. PISA 2015 data showed that 25% of the students envisaged themselves to be working in the Science field while girls showed more preference to be in health professions as compared to boys (OECD, 2015). In Singapore, 23% of students aspired to be in the medical profession (Ong & Cheung, 2016). At a Technical College, boys prefer to study Engineering while girls opt for Business and Services (Chong, 2014). It is not surprising then; the CS School girls felt their future careers were unfavourable and were happy to graduate.

In the examination context, boys have been found to perform significantly better than girls on

multiple choice tests across subjects while girls do slightly better in course work and essay-type assessments as compared to boys (Gipps & Murphy, 1994). The type of examination format at the CS School was not available. Nevertheless, it may be useful to have post-examination motivational activities which are targeted at mitigating the sharp decline in motivation of students when they received poor results (Yeh, 2010). In classrooms, teachers could discuss failure situations and discover what class lessons could be effective in improving students' learning (Carey, 2014).

For girls, it was found that positive relationships with teacher and peers, hands-on learning that is stimulating and class materials that are relevant to their experiences (e.g. topics on social justice, women) could potentially sustain girls' interest in learning (Jacobs, Kuriloff, Shannon, & Cox, 2014). It is also the school's duty to provide all children with the opportunity to discover their own identity, strengths and interests regardless of traditional gender expectations (EACEA & Eurydice, 2009). In different countries and economies, boys' and girls' strengths differ in interest and subject matter (OECD, 2013). So far, this seemingly stereotyping of the 'gender effect' on learning has affected perceptions in education (Yeung, 2011).

Education intervention has been successful on reducing the threat of stereotyping students according to gender and this has impacted learning outcomes positively (Aronson, et al., 1998). In this case study, gender-related course or future job preference, assessment type and class interactions could have contributed to girl's coping less well than boys in daily school life (see Table 18). Thus, girls could be inclined to preferring the development of nurturing skills and associated vocations such as healthcare. However, these quantitative findings implied girls' views at the CS School. Future direction could be to sort out gender-related jobs choices in an equitable understanding. It may be worthwhile to examine other types of courses that could be offered at the CS School. A follow-up to this case study research could be a qualitative study to identify what the students want as their career prospects.

5.2.6. Teachers' perspectives

As teachers are busy people, a 10-item modified MES was administrated. There was no teacher gender bias in the rating. The graduating class teachers perceived their students were more motivated and engaged than the class teachers of freshmen. Graduating students are perceived to be significantly more efficacious than the freshmen ($p < .05$). However, the graduating students' self-reported self-belief scale scores were not significantly higher than the freshmen. Why is this discrepancy? Students' self-belief factor has been discussed (see Section 4.6.9). It was suggested

that the understanding of schoolwork could help explain this disagreement between teachers' perception and the students' self-belief scores (see Appendix 6).

Schoolwork was contextualized in the curriculum of character education, English language literacy, numeracy, computing skills acquisition and vocational training. Students' self-efficacy could reside in specificity of either subject or domain. This may affect each student differently. Therefore, students self-reported scores in this case study research could suggest that the self-belief scores could be the result of a repertoire of experiences. Another qualitative study may be needed to uncover the disconnect of teachers' perception on students' self-belief and students self-reported self-belief scores.

Class teachers' enjoyment in teaching was linked positively to students' goal focus on mastery orientation, persistence and failure avoidance. These findings imply that positive student-teacher classroom interactions fuel teachers' efficacy in teaching (Bredmar, 2013) and it is the strongest predictor of students' academic success (Hattie, 2009). Teachers rated variable on planning study score as the lowest among the ten factors. This is similarly seen in students' scoring as well.

The implication of these findings is that teachers' classroom management of behaviour and cognitive skills are necessary to improve students' academic performance. Such skills acquisition from teachers' professional training could benefit the students (Guskey & Yoon, 2009). Effective teaching strategies (Westwood, 1996) and self-regulatory skills (Howse, et al., 2003) could also improve students' academic outcomes. Overall, professional training for busy class teachers could positively enhance teachers' confidence in applying relevant educational interventions to improve student learning (Sri Kanthan, 2011). While teachers' enjoyment of teaching is definitely affected by students' eagerness to learn, teachers must nevertheless create the right learning environment, for instance, putting in effort to understand students' needs, explaining the rationale behind certain tasks and providing avenues for students to seek help (Yang, 2017).

5.2.7. Staying in school

In a case of students being wrongly informed of failing a high-stakes test, about 80% of students suffered the psychological impact of failure that included strong emotions such as depression, worry or embarrassment. An equal number of these same students proceeded to increase studying, such as through reducing their extracurricular activities (Cornell, Krosnick, & Chang, 2006). A small percentage of students (4%) eventually dropped out of school. Thus, it is argued

that failure might push students who are doing well academically to leave school.

Nevertheless, research had shown that students with poorer academic records did not demonstrate the likelihood of leaving school (Griffin & Heidorn, 1996). Having experienced failure, low achieving students were more likely than high achieving students to perceive that graduation examinations as discouraging and they knew someone who had left school as a result of examination failure (Catterall, 1990). Of course, there are several occasions to identify the underachievers early (ERS, 2010). Even in the first four years of the primary education, the students would know how they are performing in school (King, 2016, p. 99). The less academically inclined students would have experienced how schooling can create lasting effects on their achievements by the time they enrolled at the CS School. What could be done is to de-stigmatise failure and teach students how to redefine success, including reframing failures as opportunities for learning (Carey, 2014). In sum, failure could evoke strong emotions that could be irrevocable (Alkhatib, 2016). A less academically inclined student may agonise and worry about examinations and be affected by the looming possibility of being a school drop-out.

This case study research showed that the denominator of the female-to-male ratio decreased when the ratio was compared at entry-point freshmen and at exit-point graduating students (see Table 11). As a caveat, these ratio findings were measured on two different cohorts of students: freshmen and graduating students. In an attempt to explain the decreased female-to-male ratio value, one plausible suggestion is that some male students could have dropped out of school after enrolment and they did not complete their education at the CS School. As the total number of students who have left the CS School prematurely, as well as their reasons for leaving, were not available, a longitudinal study would be needed to better understand this situation.

Nonetheless, the phenomenon of students dropping out of school has been studied at the granularity of ethnicity (Esa, 2012). Research showed that school-based interventions were successful at drop-out prevention (Christenson & Thurlow, 2004). Life-course perspective on drop-out prevention is viewed as the culmination of a long-term process of academic disengagement that resulted from a consortium of various vulnerable factors (Alexander, Entwisle, & Horsey, 1997). Early intervention at preventing drop-out made lasting effects that are beneficial to the child and the rest of society (Heckman, et al., 2000; Caspi, et al., 2016). Therefore, in 2016 the Singapore government started a pilot programme, the KidStart scheme, to intervene early at age zero to level up disadvantaged kids aiming to break the cycle of poverty (Goy, 2017). Further discussion is beyond the scope of this research.

5.2.8. Comparison analysis: this case study comparison with mainstream students' study using MES-HS instrument

This case study had used a commercially available MES-HS questionnaire to delineate students' self-reported scores on their motivation and engagement factors. The participants were from a specialised school aged between 12-19 years who have failed a high-stakes examination (uPE). Subsequently, the failed students were not eligible to pursue mainstream secondary school education. Overall students' self-reported MES-HS scores were listed in Table 15. Comparing this set of data to a similar set of data generated from mainstream students responding to the MES-HS questionnaire would add value to this study's findings regarding students' motivation and engagement.

A literature search revealed that there are no reported studies that have utilised the 44-item MES-HS instrument with students in Singapore. A study by Martin and Hau (2010) using the MES-HS questionnaire on Australian and Hong Kong Chinese high school students (within the age range of 12 to 13 years old) reported that there were no cultural kind differences between the two groups of students (Caucasian versus Asian) in their responses to factor structure and reliability on using the MES-HS instrument. However, their study revealed there were differences in that Australian students reported higher levels of adaptive achievement motivation and lower maladaptive achievement motivation than the Chinese students.

For comparison purpose, the data on Hong Kong Chinese school students' self-reported MES-HS dimension factors were selected for use (Appendix 14). There were three reasons for choosing this comparison: (a) the Chinese students were recruited from government schools that are considered mainstream schools⁴⁵, (b) both countries have experienced similar British colonial rule and education system, and (c) students from both countries are among the top East Asian countries⁴⁶ that are high performers in international Mathematics and Science achievements (Gurney, 2016).

The Hong Kong Chinese data were extracted and tabulated with the CS School students' MES-HS scores (Table 44). On comparison, Singapore case study students' mean scores were higher than the Hong Kong Chinese students' in all the motivation and engagement dimensions. Of special mention is that the failure avoidance score by Singapore students was 5.25 (standard deviation 1.34) and Hong Kong students was 3.52 (standard deviation 1.37). This differential amount to Singapore students self-rated scores were about 50% higher than Hong Kong students' scores. In

⁴⁵ Confirmation of mainstream school via email communique with Professor Andrew Martin on July 10, 2017.

⁴⁶ Singapore, Hong Kong, Korea, Chinese Taipei, and Japan are the East Asian countries with high performance in TIMSS.

maladaptive fail avoidance factor score, lower score is better for motivation and engagement. This could suggest that the CS School students were more maladaptive in failure avoidance than the Hong Kong mainstream students. The MES-HS 4-item on failure avoidance (see 4.6.8.) asked whether students did their schoolwork to avoid doing poorly or to avoid being seen to do poorly (such as “bad things”, being dumb) by others, i.e. teachers or parents. In comparison, the high failure avoidance scores imply that the CS School students feared failure more so than the Hong Kong mainstream students.

Table 32: Summary of MES-HS variables of CS School and mainstream school

Motivation & Engagement Dimension	MES-HS Factors	Chinese Student Data (n=528) (Martin & Hau, 2010)*		Current CS School study** (n=286)		Mean Difference [(M2-M1)/M1] (%)
		Mean (M1)	Std Deviation	Mean (M2)	Std Deviation	
Adaptive learning	Self-efficacy	5.51	1.09	5.83	1.13	6
	Valuing	5.43	1.01	5.90	1.04	9
	Mastery	5.67	1.07	5.78	0.98	2
	Planning study	4.25	1.13	5.15	1.27	21
	Task management	4.64	1.06	5.43	1.22	17
	Persistence	4.80	1.13	5.35	1.02	11
Maladaptive learning	Anxiety	4.48	1.25	5.08	1.29	13
	Failure avoidance	3.52	1.37	5.25	1.34	49
	Uncertain control	3.98	1.16	4.60	1.22	16
	Self-handicapping	2.97	1.27	3.78	1.52	27
	Disengagement	2.78	1.24	3.55	1.25	28

* Study: Martin & Hau (2010) *Achievement Motivation among Chinese and Australian School Students: Assessing Differences of Kind and Differences of Degree*. *International Journal of Testing*, 10:3, 274-294. (See Appendix 14 for data source.)
 ** CS School data is from 4-item means (Table 15) divided by 4 to get the single-item mean.

This rather simplistic comparison of MES-HS dimension factors scores between mainstream Hong Kong students and the less academically inclined the CS School students further supports the theory that failure in an important examination has emotional consequences on students, including the fear of failure, parent’s worry, parents’ negative feedback, self-evaluation, implicit theories of entity belief and anxiety (Elliot & McGregor, 2001). Thereby, less academically inclined students are motivated to avoid failure in any future events.

In summary, low academically achieving students exhibit higher level of maladaptive motivation and engagement factor by avoiding failure when compared to mainstream students. A further study in the local context would be useful to understand interventions purposes in motivational and engagement on students’ learning. Nonetheless, this comparison lends support to this case study’s conclusion that less academically inclined students experience serious emotional consequences leading to coping strategies such as failure avoidance. As discussed in the preceding

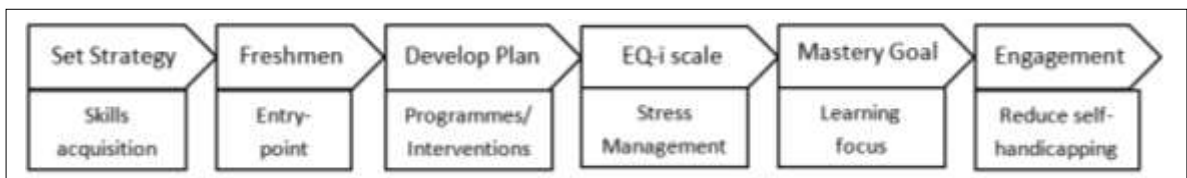
paragraphs, this observation is speculative but it could suggest the possibility of its manifestation in the fear of failure⁴⁷ that seems to be pervasive in Singapore context.

5.2.9. Convergence of EQi scales, MES-HS dimension factors and academic coping

EQi scale scores from Youth EQi: YV™ questionnaire were analysed using paired t-test on each student’s exit-point minus entry-point scores comparison of the graduating student cohort. No significant changes are noted on the students’ EQi scale scores (Table 32). However, there were layers of emotional quotients significance when data were partitioned on gender, failure status at examination and ethnicity. In data partitioned on failure status, Px-2 students scored higher on stress management scale compared to Px-1 students at entry-point (Table 38). But at exit-point, Px-1 scored significantly higher on adaptability and general mood than students who have re-taken examination and failed twice (Table 39).

In this case study, the failed twice students strived significantly harder than those who only failed once (see Tables 38). In the paired t-test, students who failed once self-reported significant improvement on EQi scale on stress management (Table 33). In fact, when the EQi scales between Px-1 and Px-2 students’ scores were analysed using independent t-test, the failed twice Px-2 freshmen strived to manage their stress significantly more so than the Px-1 at entry-point. It seemed failure motivated students to invest in energy (Fredricks, Blumenfeld & Paris, 2004). The students who had failed twice tried to control their stressful emotions effectively and constructively at entry-point (see Figure 5). By integrating students’ self-reported scores in EQi scale, MES-HS dimensions and school’s motivation programmes and academic enablers (Diperna, 2006), this case study research has drawn out a probable motivational pathway for the CS School students in Figure 6 (see Tables 16, 21 & 37; Figure 5).

Figure 6: Proposed motivational pathway negotiated by the less academically inclined students



In this proposal, the CS School has to set a strategy on skills acquisition and at entry point. Freshmen at entry-point will be assessed on their EQi competencies. Following that, to develop a

⁴⁷In Singapore context, fear of failure has been studied as a psychological barrier to entrepreneurship (Chua & Bedford, 2015).

plan with programmes and interventions for this group of students. For example, freshmen who reported low stress management scores will need more help in controlling their emotions, leading to reduced self-handicapping activities, thus improving learning focus. Importantly, Bandura (1997) found that providing students with a chance to experience success had resulted in increased self-efficacy and self-esteem. Therefore, implementing a programme with such a feature could provide impetus to freshmen to work towards a believable and attainable success goal.

In the data gathered, freshmen had self-reported mastery goal/orientation as their main motivation and engagement factor (Table 21). This observation is supported by other research that, in a learning orientation, setbacks/test failures are often attributed to a lack of effort and the subsequent orientation would be to increase effort in the achievement goal setting (Elliott & Dweck, 1988).

In addition, freshmen low scores on the disengagement dimension and low self-handicapping activities (see Table 16) indicated that they would strive to behave appropriately by being engaged at schoolwork. This motivation of engagement by exhibiting less maladaptive behaviour of disengagement had been shown to lead to academic achievement (Finn, 1993). From the correlational data, this case study proposed a motivational pathway that could probably be adopted by less academically inclined students at the CS School (Figure 6).

From the graduating students scores, the Px-1 scores are significantly higher in adaptability and general mood (see Table 38) than the Px-2 scores. This finding could suggest that Px-2 did not sustain the effort investment over the next three years of schooling (see Table 33). It could be argued that these low-achievers, by interacting with low-achieving peer groups, may have become less motivated over time (Kindermann & Skinner, 2009). However, it could also simply be that these students need help to sustain their learning focus, as proclaimed when they were freshmen (see Tables 21 & 38).

The failed twice students seem to over-strive to avoid failure. However, their perceived success is often motivated by fear. This may not be desirable as such motivation may lead to doubts in their abilities to succeed in the long term. They may become failure accepters and give up on succeeding (Covington, & Roberts, 1994, p. 41). The meaning of failure is important because of its implication on accordance of failure to either lack of effort or incompetency/lack of ability (*ibid.* p.62).

A possible suggestion is to motivate students to be success-seeking, forward-looking, optimistic and resilient in the face of setbacks (Martin, 2010). Teaching students to use success strategies and discouraging the use of attributional internal-stable low-ability terms employed by helpless students to encourage success (Diener & Dweck, 1978).

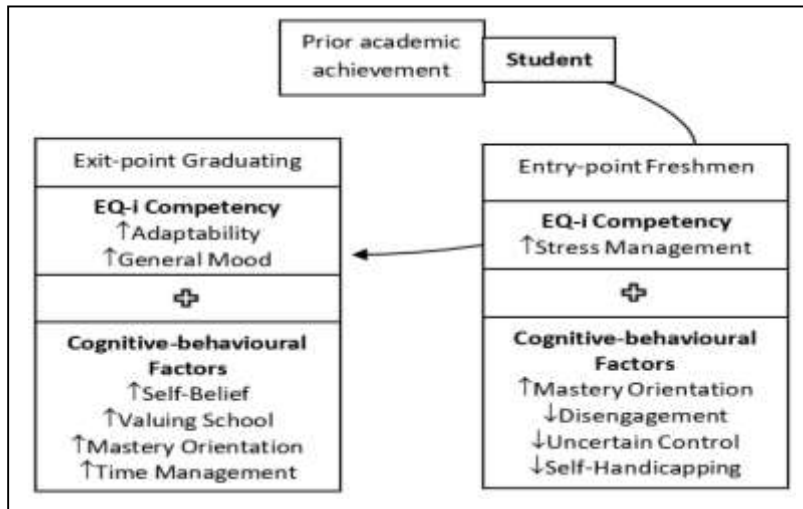
Local research on students of low achievement (defined as failure to meet average academic performance) has explored various interventions to level up students' performance via the academic ecological systems (Wang, Teng, & Tan, 2014). In this case study, academic achievements were not available to confirm the implied finding that perceived success is motivated by the fear of failure. In sum, students need to learn from failure and believe that the mind is malleable to successful outcomes.

Increased EQi scale score on stress management has been linked to reduction in uncertain control factor (see Figures 4 & 5). Hence the motivational outcome that could explain the "turn-around" graduates who possess high EQi scales of adaptability and general mood as convergence depicted in Figure 7 (see also Table 40). EQi adaptability scale consists of three subscales of reality testing, flexibility and problem solving. This compares favourably to the American Psychological Association's definition on adaptability: "the capacity to make appropriate responses to changed or changing situations; the ability to modify or adjust one's behaviour in meeting different circumstances or different people" (Martin, Nejad, Colmar, & Liem, 2013, p. 729).

Graduating students rated adaptability scale significantly and this was correlated to the adaptive motivation dimensions of self-belief, valuing school, mastery orientation and time management of study tasks. This finding is similar to Martin et al. (2013) study that adaptability predicts class participation, school enjoyment and positive academic intentions positively. In addition, general mood scale comprises two sub-scales of positive psychological factors of optimism and happiness (Seligman, et al., 1995). Descriptors of positive adaptation include 'the capacity for positive adaptation in the face of extreme stress or adversity', 'stress resistance', and the ability to 'bounce back' (Goldstein, 2005). Again, a correlation with academic outcomes would be pertinent to inform and identify students who could benefit from the CS School education.

In summary, this case study research reports the continual and convergence of motivation and engagement and students' emotional competence in EQi adaptability and general mood scales from the self-reports of the CS School graduating students (Figure 7). This finding is positive to identify 80-90% of the graduates have acquired skills certificates towards future employment and achieved academic success at the CS School.

Figure 7: Convergence of emotion quotients and motivation-engagement dimension factors



5.3. Limitations

In this research, students self-reported emotion quotients via the Youth EQi: YV™ scales, MES-HS and academic coping. Therefore, emotions played out at classroom by teachers and peers were not being assessed. This case study researcher argues that this is a pedagogy-content process is best undertaken by the teaching fraternity because of specialised skills and knowledge required.

These are important aspects of motivation that includes students' accurate evaluation accurately on their teachers' excellence in teaching (Hattie, 2009, p. 35). Other aspect such as feedback from students could level up academically-weaker students through the learner and inquiry-based pedagogies that are conducted by professional and caring teachers (Gopinathan & Sharpe, 2014). How students placed their beliefs on their abilities and their perceptions in contextual situations such as teacher's praise on personal achievement. This may affect the entity theorists to interpret that failure in future tasks would means shame; instead teacher should praise efforts (Mueller & Dweck, 1998). To evaluate on the accuracy of the EQi scales scores, an observational research approach would be required.

In addition, social motivation research on classroom's collaborative scaffolding techniques and interdependency of peer support such as incremental/growth theorists' helping fellow students to learn (Urdu & Maehr, 1995; Dweck, 2000) are just as important in education. Socially, role and family is important on student well-being (Clinton, 1996). How parents' value education could effectively navigate children school success (Harackiewicz et al., 2012). Included are how the interlocking systems influence the students' development of their physical, social-emotional and cognitive competencies (Bronfenbrenner & Ceci, 1994). Researchers have shown that when social

interpersonal environments were controlled for, authoritative parenting, peer acceptance and teachers' positive affect each had a unique positive association with students' task-focused behaviour which in turn promoted subsequent academic performance (Kiuru & etal, 2014). Nevertheless, among the personal and contextual factors such teacher, parents and peer support, it is the teacher-student association that is the strongest influencer on students' school engagement (Lam, Wong , Yang , & Liu, 2012). In this study, the questionnaire was administered to class teachers only.

This case study researcher has utilized a short self-report instrument to measure teachers perceived self-beliefs on students' cognitive-behaviours. Thus, a disparity between subjective and objective measures of a particular perspective is to be expected. As current situation of student-centredness learning, the findings should be interpreted as interacting dimensions of school, teacher and student involvement in the learning environment. Also, this quantitative assessment might not have captured other factors that could influence teachers' beliefs and perception such as on students' engagement at learning (Sri Kanthan, 2011).

Another limitation is the reliability of the students' self-reported data that may have errors in hasty completion and exaggeration. For example, in this study, one student reported the scores as 4 (Likert-scale of 1 to 7) middle-range for all the 44-item MES-HS. This student's data was not included in the analysis. A qualitative survey would be able to delineate such behaviours, However, this was not possible because the researcher was granted a one-time survey/interaction with the students.

Hence, this case study used the freshmen input as the pre-test variables of cognitive ability and their behavioural display to associate with the changes in the graduating students' self-reported scores in correlational effects. It is a measurement of one-point in time. As achievement outcomes were not available, therefore this study does not imply causality of learning at the CS School. Moreover, class engagement that promotes continuing motivation, commitment to learning new material, better personal adjustment in school and reduced drop-out rate were not salient in this case study.

Nonetheless, this case study researcher is aware of the overlap of concepts such as academic coping, optimism, resilience, achievement goals, etc. that may require further research. For example, students could have focused on achievement goal that was most relevant at a particular time or in a particular context because of a general person-environment fit (Senko, Hulleman, &

Harackiewicz, 2011). It has been suggested that students can hold both mastery and performance goals in a framework of adaptive motivation in achievement learning (Heyman & Dweck, 1992).

Quantitative data are at best generalisations but it would point out the general direction on how well the students are doing at the CS School. A qualitative approach could delineate the current quantitative findings of any distinct constructs or any variations of the same phenomenon, for example in students' perception of the MES-HS 4-item self-belief scale (see section 4.6.9.). There is an apparent need to calibrate efficacy beliefs and how they are linked to, self-regulation and behaviour because of the likely multiple motivational pathways for the energisation and direction of behaviour (Pintrich, 2003).

To summarise, future research should also include focus on social factors, such as group dynamics, school culture and motivational climates. Contributing to this milieu is the classroom structure that could affect the needs satisfaction and behavioural regulations.

5.4. How would this research be done differently?

If I were to do this research differently, I would like to improve on the design, visit students more than once (learning from this one-time interaction granted in this research) and obtain qualitative findings using small group interviews. There are four parts to the design:

Part 1. Students' and class teachers' participation in two-timed measurement: entry-point (freshmen) and exit-point (graduating students).

Objective: Same cohort of students would ensure consistency of self-reporting and participation.

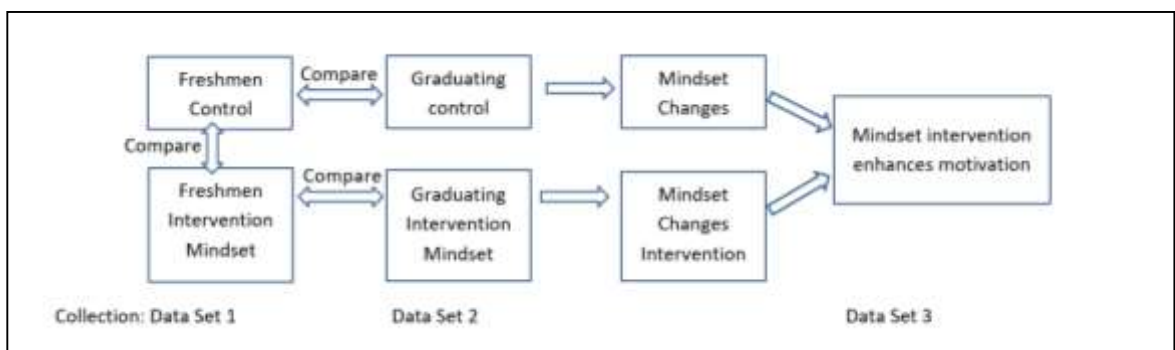
Method: Use MES-HS questionnaire and academic coping survey to students at entry-point and exit-point to the same cohort of students. Similarly administer the Teachers' perceptions of their students' motivation and engagement questionnaire and Teachers' enjoyment of teaching. Included in the questionnaire would be a question on their confidence in teaching because it would ensure focus on self-belief at teaching. The scores of freshmen class teachers would be compared with the scores of graduating class teachers to explain data such as the mismatch of self-beliefs in students, as was found in this case study.

Part 2: School participation. Dweck's Intelligence survey pre- and post-mindset intervention programmes on implicit theories of self.

Objective: Intervention programme on expanding intelligence is advantageous to the low-achieving students who have failed an examination that would limit their choice of mainstream secondary schools and education paths.

Method: Identify the two main theorists of students (freshmen and graduating students): one group of entity self-belief theorists and another group with malleable, growth self-belief theorists. Randomly select freshmen, administer the malleable growth mindset programme to one group and normal the CS School programme (without the “mindset” component) to another (Data Set 1). The post-intervention freshmen mindset would be compared to graduating class mindsets Figure 8 (Data Set 2). The findings could indicate if changing freshmen mindsets would impact the CS School programmes (Data Set 3). The hypothesis is that mindset changes could enhance motivation and engagement from lived-in experiences and that these could be measured quantitatively.

Figure 8: Future study to incorporate programme promoting mindset changes



The rationale for this approach is to differentiate the growth mindset students who bounce back and adopt a learning approach versus and the fixed mindset students who malign their abilities and suffer from low-effort syndrome after failing an examination. Eventually the growth mindset improves in grades while the fixed mindset declines in grades. Thus, identifying these mindsets could change a student’s perspective to love of learning and a resilience that is the basis of academic success (Dweck, 2008). Note the length of time (3-4 years) between entry-point and exit-point data.

Part 3: Methodology-include conducting observation and small-group interviews

Objective: This case study’s quantitative data have shown the limits on what can be understood through such self-reported data. Conducting observations could provide access to real-world situations. It adds a dimension of insight into the context and meaning surrounding what people say and do. This complementary qualitative data would help shed understanding on what

students' emotional competencies that may operate in motivation. However, the objectives have to be specific. Otherwise findings could be drawn into the dilemma of interpreting cultural or sensitive issues that are operationalised in classroom.

Method: Two small focus groups of 4-5 students (each group of freshmen or graduating students) answering semi-structured questions that help explain aspects of the quantitative data that arose. Limit the interview to an hour each time. Data will be coded and evolving themes will provide rich students' lived-in experiences at the CS School. Data such as skills development from students' perspectives could interpret the observed EQI scales on interpersonal and intrapersonal.

Part 4: Use of emotional quotients of students that were measured by the CS School to integrate findings from the questionnaires/surveys and qualitative data from students' lived-in experiences.

5.5. Recommendation

This case study suggests that less academically inclined students need help to sustain their learning. A suggestion is to incorporate school programmes to manage freshmen's personal stress and ensure control of their emotions in order to achieve focus such as classroom engagement on planning, monitoring and controlling of their school work (Wang, Teng, & Tan, 2014; Ng & Li, 2014). In addition, a targeted approach could be developed for students who failed an examination to receive immediate guidance to keep them motivated because of the sharp decline in their academic self-concept experienced after failure (Yeh, 2010).

School- and/or education system-based factors such pedagogy, curriculum, assessment, teacher quality, attitudes, school culture and structure are important aspects of educational support. One example is to move away from "achievement gap" and the practice of using tests to assess students' performance at a specific point in time (Jackson, 2011). Instead, teachers should be empowered to adopt flexible approaches to create practices that would promote self-directed learning focusing on students' strengths to build skills (MOE, 2012c) and the use of self-learning tools such as chunking (Skinner, Pappas, & Davis, 2005), regulatory strategies (Germeroth & Day-Hess, 2013) and asking for help (Ryan & Pintrich, 1997)

Another suggested approach is to teach student skills acquisition (Villares, et al., 2011) such as help-seeking behaviour (Finn, 1993), asking questions (Rosenshine, Meister, & Chapman, 1996), as well as skill enhancement that fosters non-cognitive skills and personality traits, goals, character, motivations and preferences that would be important at workplace (Farrington, et al., 2012; Kautz, Heckman, Diris, Weel, & Borghans, 2014). Skill development is a dynamic process, requiring

teachers to explicitly teach weak or absent students' essential skills so that the latter can be motivated and be successful as a learner (Daly, Witt, Martens, & Dool, 1997). In totality, schools should create a learning environment where achievement goal orientation is on development of skills, while mastery goal is focussing on process of understanding and accepting challenges (Kaplan & Maehr, 2007).

There should be awareness of how teachers' perception of students' abilities may influence students' motivation (Wang, et al., 2017). Teachers would be to modify mental thinking such as reducing implicit theories of fixed entity and nurture growth mindset (Dweck, Walton, & Cohen, 2014). Growth mindsets thrive on the mastery of learning goals and the intrinsic motivation.

In addition to the tradition of transmitting knowledge and teaching skills, it is also important to teach student on the 'meta-disposition' of capacity to learn and expanding their learning capacity. A disposition is merely an ability that is disposed to make use of, for example, being willing and ready, where resilience is a disposition to use when the person is ready and willing to persist in the face of difficulty. The 'learning to learn' initiative would be a continuous process of critical and creative reflection on teacher-student relationship between emotion and learning. These seeds of practical ideas may be adapted and discussed. The dispositional approach is to help students to develop an all-rounder capacity to learn.

The final recommendation is to explore qualitative research on students on their CS School experience and career aspirations because there are many routes to young people's potential (Davie, 2016c). The phenomenon of students' real-world experiences could contribute to the meaning and purpose of schooling in a highly complex and sometimes contradictory school environment. This would probably explain why some students like the CS School while others experience problematic interpersonal factor in school context.

This quantitative case study data could be enriched by be enriched by small groups discussion and input from a parental survey. Some explanations are needed to explain the contradictory data expressed by the CS School girls. Though they were not optimistic of their future careers (low intrapersonal scores) and not coping well (see Table 18); yet they were happy to be graduating (significantly more so than the males; see Table 35). The students should be allowed to answer questions on their own so as to minimise any possible Pygmalion influence. In addition, the "fear of failure" seems to be comparably a Singaporean phenomenon (see Table 44). A complementary qualitative survey would provide directions for the CS School interventions on the plausible sources of high failure avoidance conveyed by the graduating students (see Tables 19 & 25).

Chapter 6. Conclusion

6.1. Motivation and engagement in process

This case study research aimed to study the motivation and engagement dimensions of the less academically inclined students. The Ministry has designated the CS School with special features conducive for positive learning and to provide “ladders” to level up these academic underachievers who have failed an upper primary school examination (uPE).

Failure brought about emotions that prompted freshmen to be in control of the stressful condition (Table 33) so they could study and master learning (Table 21). They proclaimed not to be disengaged and would attain learning by adopting strategies of less self-handicapping, such as classroom participation and attendance (though these activities were not salient to the researcher).

Freshmen Youth EQi: YV™ assessment at entry-point provided indicators for the CS School to arrange educational programmes to motivate and engage them. Figure 6 shows the proposed path of motivation taken by the CS School students. The underachieving students, having failed an examination, strive to overcome the negative emotions such as anger and depressive states to engage in learning⁴⁸. Interestingly, this investment of motivational effect exerted by the freshmen at the outset was not observed to persevere and this striving probably did not last over the next three years of schooling.

Overall, the CS School graduating students who scored high on EQi adaptability and general mood scales were correlated to adaptive behavioural-cognitive motivation and engagement factors of self-belief, valuing school, mastery orientation in learning focus and time management (Figures 5 & 7). Students who acquired EQi interpersonal scale competency would be adaptive in valuing school and mastery orientation.

In addition, girls were not academically buoyant, scored low in EQi intrapersonal scale and were uncertain in their control of their study. Nevertheless, they were happy to be graduating from the CS School. Students who experienced repeated failure in an examination rated lower EQi scale competencies. Different ethnic groups reported different aspects of their EQi competencies that

⁴⁸ Researcher anecdotal observation: On questionnaire day, freshmen (who have failed the uPE twice) sat together, quietly and diligently completing the MES-HS questionnaire. Whereas the freshmen (who failed uPE once) were moving about and class teachers had to quieten them.

had been associated with positive and negative aspects of the motivation and engagement dimensions. These multicultural differences are manifestations of contextual display of home economies, parental education and students' prior cumulative educational experiences. In the real-world of striving to overcome low academic attainment, to "be somebody" who would be trained with the relevant skills and be equipped with knowledge for life-long learning. At the core of the students' social emotional competencies is the aim to support students' well-being, enhanced positive academic and non-academic outcomes with adaptability to perform in an autonomous environment (Tarbetsky, Martin, & Collie, 2017).

6.2. Proposed Model for motivating of the less academically inclined students

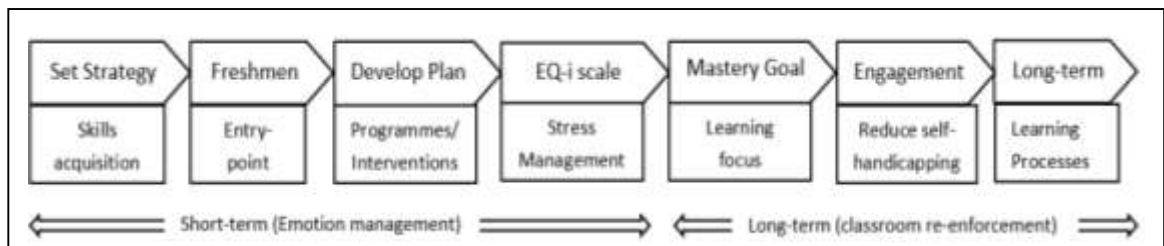
In this case study, acquiring competency in EQi stress management scale and intrapersonal scale would be the first step to self-control of their emotional difficulties experienced at failure academically. It is the start of a successful journey at positive learning constructs by reducing maladaptive behaviours (Table 43). Once being engaged, it could fuel teachers' motivation and enjoyment at teaching. This positive energising process would further translate to warm teacher-student relationship and enhance students' participation and engagement in the learning process (Yang, 2017).

This case study research proposes a motivation model for progressively engaging the less academically inclined students (Figure 9). The motivation model is viewed in two temporal spaces: the short-term motivation and long-term classroom re-enforcement to sustainment of motivation. The short-term engagement plan would be to restore students' academic self-concept and management of stress control. The model proposes a guided mastery treatment builds coping skills and instil beliefs: a) ability to control over potential threats of high anxiety arousal, and b) reduce coping deficiencies that impaired by intense apprehension and phobic self-protective reactions (Bandura, 1994). This dual-structured mastery guide intends to create positive attitudes through successful elimination of biological stress reactions in the initial short time frame.

Still, school engagement programmes such as attribution re-training and positive school-based interventions are necessary. Teaching students how to overcome the fear of failure by changing their perceptions of the causes of failure (e.g. internal, unstable and controllable factors such as lack of effort) can raise students' confidence and help them to convert avoidance behaviour to approach mastery orientation within an individual (Weiner, 1992; Haynes Stewart, et al., 2011). This approach to teaching less academically inclined students thinking skills and the ability to ask

for help is what matters in learning (Tay-Koay, 1997; Lim et al., 2005). Yet, teachers would know that teaching interventions tend to boost the performance of high achievers more than the disadvantaged students. Therefore, schools should be aware of this when implementing such programmes with low achieving students especially in mixed abilities classes (OECD, 2011a).

Figure 9: An engagement model for progressively motivating the less academically inclined students



The second phase of the proposed model is the long-term engagement plan. It requires teachers' sustained efforts to maintain students' interest, encourage the students to value school, teach self-regulatory strategies and provide regular feedback on students' learning, amongst other efforts. Local research supports the notion that, for academically weaker students, teacher autonomy (e.g. pedagogical competence) is a strong predictor of students' academic engagement.

Exposing students to possible structures of organised learning by teachers (Newton, 2013), and having teachers lead students through meaningful reception of learning (e.g. linking new information with familiar prior learning in a repeatability manner) enhances students' learning (Ausubel, 1968). This social cognitive function of Vygotsky's ZPD and scaffold support learning has been recognised to be advantageous for weaker academic students (Burman, 2008). Therefore, these teachers' efforts would create an environment for learning (Lim, Herdberg, & Tan, 2005).

In the long term, successful students would be optimistic of academic achievement through developing social-emotional competencies and coping strategies. Students' success is also dependent on their beliefs such as capacity to work hard and perseverance in completing difficult tasks expressed as "grit" (Duckworth, Peterson, Matthews, & Kelly, 2007). The possibilities to academic success will be those who adopt growth mindsets where failures or setbacks serve as motivation to work harder (Dweck, Walton, & Cohen, 2014), and those with self-discipline that aligns with successful goals and objectives (Zimmerman, Bandura, & Martinez-Pons, 1992).

The promotion of motivational and engagement activities could be resource-intensive and would require a high level of commitment by the school to engage students, elicit parents' support and

retain teachers who care. For sustained motivation and engagement, a feedback loop is beneficial to learning (Fuchs, et al., 1997; Hattie & Timperley, 2007). The school would need to create opportunities for learners to decrease self-talk that has negative emotional consequences and invest in cyclical self-regulation to generate positive emotions (Martin, 2012c).

To promote a self-directed learning process, student-generated and teacher-guided learning should include other learning dispositions instead of just focussing on closing the achievement gap. For instance, learning could move towards helping students develop individualised development plans, promoting personal bests at classroom performance (Martin, 2006b), and recognising individual interest and mastery goals (Hidi & Harackiewicz, 2000). Schools should actively create a relational environment that supports students' self-expression and curiosity for understanding (Strong, Silver, & Robinson, 1995). The convergence of graduating students' self-reported adaptability and optimism were linked to adaptive learning factors of self-beliefs, valuing school, mastery in learning goal and tasks management (see Figure 7).

In education, intelligence is often accorded to academic attainment. Failure in a high-stakes school examination could have detrimental effects on students' beliefs in their subsequent tests performance. Accompanying failure is often the socio-emotional baggage that comes with it because of self-perceptions and of their significant others'. How students deal with the affects could be related to their implicit self-beliefs that is linked to whether they accord failure as lack of intelligence to a fixed entity or failure as a singular point in time so it motivates them to try harder to succeed and believe that intelligence as malleable (Dweck, 2008).

Believing that intelligence is a fixed entity is more frustrating because educational psychology theories have explained re-engagement in various scenarios or situations depending on how these are linked to students' learning. If emotions affect the protection of self-worth, students would put obstacles to impede learning with ensuing self-defeating tactics e.g. self-sabotage/self-handicapping, being disruptive in classroom or not participating (being disengaged). Most important than battling of self-emotions is the prevention of opportunities to learn such as not participating in remedial class (Hong et al., 1999). How the students accord ability and effort are also part of students' self-preservation emotionally and in social situations.

Perhaps the underachieving students could improve positively when they are mentored as a broad developmental intervention. One example is the cross-age mentoring program that an older youth (mentor) is matched with a younger student (mentee) for the purpose of guiding and supporting

the mentee (Garringer & MacRae, 2008). The program is successful in areas of academic (such as grades and academic achievement), social (connectedness to school and peers, prosocial behaviour and attitudes), and emotional development (feelings of competency and self-efficacy). An example is a locally community-based mentorship initiative that has garnered successful educational outcomes (Mendaki, 2011 & 2012). Successful adolescent mentoring is considered as an age-appropriate version of parental involvement because parental involvement is a component of successful early interventions that is positively-linked academically (Kautz, et al., 2014).

But most important is to be kind to the self by reducing self-criticism that would offset its negative effects of failure and move forward to positive perspectives of lifelong motivation (Neff, 2015). Moreover, visible manifestations of engagement are representative of students' attitudes and values towards schooling, of which 'stamina and hard work seem to make more of a difference in performance among the highest-achieving students than among the lowest-achieving students' (OECD, 2013).

In order to help the student maintains lasting motivation effects over the long-term, teacher-led programmes are essential to provide regular checkpoints and feedback on students' academic performance on their learning processes (Dornyei, 2000). The underachievers may need more help to develop the habit of thinking and asking for help over longer period of time (Tay-Koay, 1997). Programmes such as teaching thinking skills have shown significant improvements in coping efficacy that reduces depressive attributions and use of productive strategies (Cunningham, Brandon, & Frydenberg, 2002). Underachieving students need to believe that investing effort in learning is worthwhile because intelligence can be changed through sustained hard work (Willingham, 2009, p. 132). Indeed, after motivation students need to develop skills to sustain engagement (Huxtable & Shenoy, 2016). Indeed, this case study has shown that learning needs to be sustained with regular feedback for learning long after the initial successful stress control.

In Singapore, it is the work of meritocratic process and its meaningful display of expectations such as good results that equal entry to prestigious/choice school despite of the Ministry promotion of a big picture of "Every School, a Good School". It is with this understanding that teachers need to manage the less academically inclined students; know why students do what they do. It is to move away from their thinking that ability as stable to effort that is controllable. Also, there is a need to teach disengaged students to stop their "arsenal of excuses" for not doing well. Teachers need to encourage academic goals such as mastery of learning. Classroom activities need to include self-regulatory role in persistence, planning and monitoring behaviours that would minimise failure avoidance.

In addition to researched school interventions that mitigate failing behaviours would be to encourage positive actions such as improving attitudes toward learning in a concerted classroom control (Ng & Li, 2014; Teh, 2014; Wang, Teng, & Tan, 2014).

At the CS School, the graduating students self-reported that they have acquired positive emotions of adaptability and general mood scales. Adaptability showed that students are objectively in control of external and new situations. They have the ability to adjust their feelings and solve problems in a social setting. This coupled with improved general mood, would lead them to experience optimism about their future. These findings were significant in context of comparing students who experienced repeated failure (Tables 35, 38). Being adaptable means increased class participation that lead to students' enjoyment of schooling (Martin, et al., 2013).

This case study research correlated adaptability to positive academic findings of adaptive motivation and engagement dimension factors of self-belief, valuing school, mastery orientation and time management dimension, though there were no significant increases in scores between freshmen and graduating students (see Tables 17, 39). Out of these four positive factors, time management for graduating students seems lower than for the freshmen. Similar scoring is noted with factor planning that is not correlated to any EQi scales (see Figure 4). Both time management and planning are scored relatively lower than other factors of self-belief, valuing school, mastery orientation and persistence.

This finding could suggest that students may need help in utilising self-regulatory activities from teachers. Guide them to create learning opportunities for students to maximise their potential learning outcomes (Urdan & Schoenfelder, 2006). Help them develop cognition control in self-efficacy (Bandura, 1997). Create self-agency that generates in-control of positive academic outcomes (Chong, 2006). In sum, self-driven students enjoy, value and feel more competent and put in more effort in school (Wang, et al., 2017). The correlation of EQi scale scores and its impact on learning could serve as a point of reference when dealing with less academically inclined students (see Table 43).

There were subtle cultural differences of learning when students rated their EQi at the CS School. The graduating Malay students announced that they were happy and optimistic with the most significant improvement in general mood scale among the three ethnic groups. Also, they rated significantly high scores on mastery orientation, being engaged though seemed to be most anxious. Both Chinese and Indian students said they learned to manage stress. The graduating

Indian students rated that their social interpersonal relationships deteriorated significantly. The Malay students who experienced repeated failure scored much lower in their intrapersonal scale at exit-point. In totality, repeated failure had resulted in both intrapersonal and interpersonal scores in the lower exit-point scores. In addition, students with repeated failures seemed to strive significantly harder (see Table 33, 37). In sum, the Malay students liked the CS School probably due to the support and ecological factors that were conducive of their well-being and learning. The Chinese students were in control of their stressful situation (e.g. stress management) but were not as anxious as the Malay students. The Indian students were in control of their stress, engaged in learning but were not interacting well with the other students. These findings could suggest that the students were probably engaged in learning in a multicultural context within their own comfort zone (Tan, 2005), behaving appropriately and graduating with skill certificates for employment or further academic careers.

The girls were not coping as well as the boys at the CS School. They self-reported that they were happy and optimistic on graduating from the CS School but intrapersonal scale scores were lower on graduation. It seemed to contradict the general mood scale. This speculative attempt to understand the statistics would be better answered via a qualitative longitudinal study from their lived-in experiences at the CS School. An objective search is necessary on girls' career aspirations in an equitable manner.

Teachers reported that they would enjoy teaching more if their students are learning for the sake of learning, be persistent and not to avoid failure. The junior class teachers seemed to enjoy teaching more than the teachers of 10 years or more but data was not statistically significant. Enjoyment could also be interpreted as teachers are motivated to teach when students show interest in learning (Yang, 2017) and with enthusiasm denoted as "good work" (Bredmar, 2013). The belief system of teacher may be correlated to students' intrinsic motivations and goals (Wang, et al., 2017).

In this study, the class teachers of graduating classes perceived that their students' self-belief in learning is significantly higher than the class teachers of freshmen (by independent t-test comparison). There was no gender difference in the teachers' self-report rating on perceptions of students' motivation and engagement scales. However, the students' self-belief scale scores of graduating students were higher than freshmen but were not statistically different. Teachers' perceptions of students' planning and time management low scores were in congruence of students' self-reported scores. Similarly scores levels were noted of teachers' perception and

students' scores on the four adaptive factors self-belief, learning focus or mastery orientation, valuing school and persistence.

This case study has identified the emotional quotients of students and linked these EQi scales to the motivation and engagement dimensions factors and academic coping that converge with teachers' perceptions of students' motivation and engagement factors (see Figure 7). The convergence embodies the multiple layers of realities manifested in seemingly different subtleties of students' prior unpleasant experiences of examination failure, gender learning difference, cultural perspectives, school environment and teachers' perceptions.

In summary, a learning path was proposed to have been undertaken by these less academically inclined students when they arrived at the CS School (new academic focus, new social environment) and recovered from set-back of major examination failure(s). They strived diligently to learn new skills, and acquired new knowledge to continue within the education process (see Figures 7 & 9). It is the result of setting small achievable goals in the form of scaffolds, feedback on learning and continue self-regulatory control on learning supported by the whole school approach.

This case study consolidated the students' emotional competencies with motivation and engagement dimension factors and coping ability. It is believed that this convergence of emotional, cognitive and behavioural findings is the first of its kind because of the relatively little prior research in this convergence of different components contributing to successful learning. It is a model of motivating the less academically inclined students to being engaged at schooling following a temporal learning process of sustained stress control and classroom engagement.

There is room for research on this proposed model to further document the effectiveness, reproducibility and reliability. This model is the result of a quantitative measurement of motivation and engagement dimensions. More work is needed to weave in phenomenal scenarios in real-world motivation of less academically inclined students. The model of re-engaging failing students would be applicable in other streams, too.

6.3. Concluding remarks

This case study research is a reported contemporary phenomenon within its real-life context. Many interesting variables or data points were converged in a triangulating model of motivating

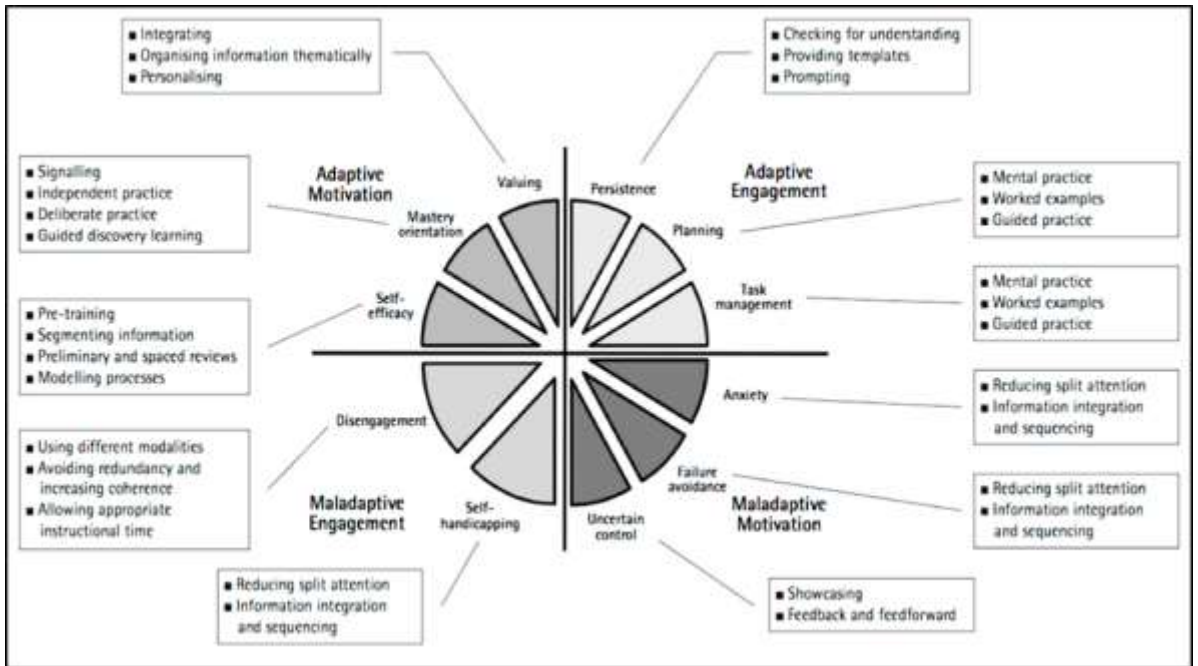
the less academic inclined to engagement following of success in learning. It is a quantitative measurement of cognitive and behaviour experiences reported by the students and their class teachers. This case study research is value-laden at informing teachers on similar phenomena in school and its relevance in its relatability to less academically inclined students (Bassey, 1999). The quantitative nature of this case study with the presentation of means, standard deviation and significance was meant not to obliterate the individuals who participated.

The data transformed educational knowledge have been correlational and within the bounds of this case study. Nonetheless it offered layers of information that were contextualised in ethnicity, self-reported real-world experiences of failure and repeated failure, gender effects, daily resilience at school works, and teachers' perceptions of their students' motivation and engagement that were linked to teachers' enjoyment of teaching. The interpretations of this educational research were drawn from assumed conceptualised information of positive school ecological climate, relational peer interaction in a multicultural society and parental aspiration for their children's education that are in line with the national objective of life-long learning. In addition, literature search on studying emotions of failure in a high-stakes test was limited to one report from the United States (Cornell, Krosnick, & Chang, 2006). That was a retrospective study using telephone to ask questions on student reactions to being wrongly informed of failing the Minnesota basic standards test. No follow-up study was done on how these "failure" students responded to subsequent schooling (especially for those have failed).

Therefore, this case study research conducted at the CS School is unique and could be the first of its kind to document how less academically inclined students expressed their real lived-in experiences at "second-chance" schooling amidst set-backs, emotional hardship and stressful conditions.

Appendices

Appendix 1. The MES-HS Motivation and Engagement wheel with comments

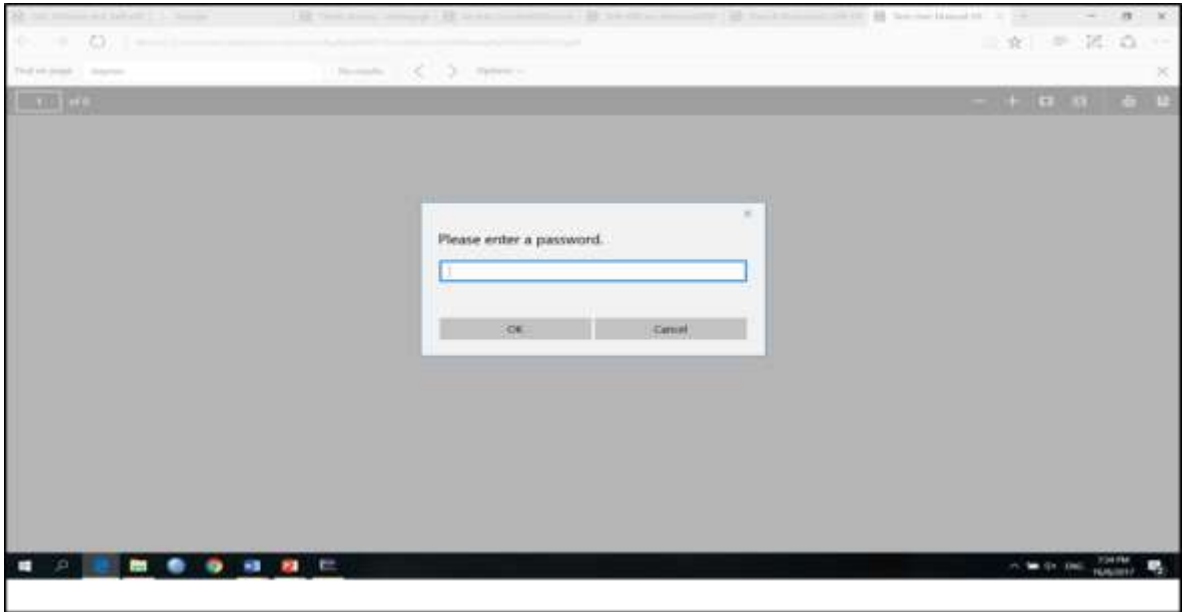


Source: Adapted with permission from Dr. Andrew Martin (2012 b). *The Motivation and Engagement Scale (12th Edition)*, Lifelong Achievement Group, Sydney (www.lifelongachievement.com)





Two Positive Constructs of MES-HS wheel
 - Adaptive Motivation (Booster Thoughts)
 - Adaptive Engagement (Booster)

Two Negative Constructs of MES-HS wheel
 - Maladaptive Motivation (Mufflers)
 - Maladaptive Engagement (Guzzlers)

Appendix 2. Password user manual (Martin, 2012b)



Appendix 3: Permission granted by Ministry of Education for a case study research

	<small>1 North Buona Vista Drive Singapore 138675 Robinson Road P. O. Box 748 Telephone : (65) 68722220 Facsimile : (65) 67756625 Website : www.moe.gov.sg Email : teo_kie_eng@moe.gov.sg leong_choi_peng@moe.gov.sg</small>	
Ministry of Education SINGAPORE		
EDUN N32-07-005	Request No.: RQ74-12(04)	
30 April 2012		
Ms Ong Siew Kim Blk [REDACTED] Singapore [REDACTED]		
Dear Ms Ong		
CASE STUDY ON CHARACTER PARTICIPATION EDUCATION PROGRAMME FOR THE ACADEMICALLY DISINCLINED STUDENTS AT A SPECIALISED SCHOOL		
I refer to your application for approval to collect data from schools.		
2 I am pleased to inform you that the Ministry has no objections to your request to conduct the study in 1 school. Please use the <i>attached letter, including Annex A and the application form</i> to seek approval from the principal and during the actual study.		
3 Please observe the following conditions of approval for conducting research in schools:		
a) to adhere to the approved research proposal;		
b) not to publish your findings without clearance from the Ministry;		
c) to make sure that participation by the school is duly recorded in Annex A; and		
d) to complete the data collection in school within 6 months from the date of this letter.		
4 Please acknowledge receipt of this letter by contacting me at Tel: 68796065 or Ms Leong at Tel: 68795976. Alternatively, we can be reached at any of the e-mail addresses at the top right hand corner of this letter.		
Yours faithfully		
		
Teo Kie Eng (Ms) Head, Data Administration 3 Data Administration Centre for Permanent Secretary (Education)		
		<small>Integrity, the Foundation • People, our Focus • Learning, our Passion • Excellence, our Pursuit</small>
Data Administration Centre Planning Division Ministry of Education		

Note: Title of the case study research is modified as “A case study on exploring the motivation and engagement of the less academically inclined students in a specialised School in Singapore”.

Appendix 3: Permission granted by Ministry of Education for a case study research: Annex A (continuation)

Request No: RQ74-12(04)

Annex A

CASE STUDY ON CHARACTER PARTICIPATION EDUCATION PROGRAMME FOR THE ACADEMICALLY DISINCLINED STUDENTS AT A SPECIALISED SCHOOL

School Participation Record

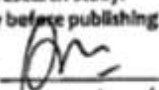
Please ensure that the following numbers have not been exceeded:-

1. *Total number of Schools* : 01
2. *Total number of Pupils* : 200
3. *Total number of Teachers* : 2

No.	Name of School	No. of Pupils	No. of Teachers	Date of Interview/Survey	Signature of Principal/VP
1.					





Appendix 3: Permission granted by Ministry of Education for a case study research: Annex A (continuation)

REQUEST FOR APPROVAL TO COLLECT DATA FROM SCHOOLS

Title of Project			
A case study on character participation education programme for the academically disinclined students at a specialised school			
Purpose of Collection <i>(please attach research proposal if available)</i>			
The purpose is to conduct a doctoral level research in a Secondary School to ascertain the key success factors of the character education programme in a vocation school			
Methodology: Survey/Interview/Observation/etc <i>(attach copies of instruments to be used)</i>			
Both quantitative and qualitative research methods will be used. <u>Quantitative:</u> One 20 minutes survey will be conducted with students, staff and parents of [redacted] - Please see instruments submitted for details (Bar-On surveys from school archive) and CREE for Collective Responsibility for Excellence and Ethics for students, staff and parents. <u>Qualitative</u> -Semi-structured interviews will be conducted with 6 students and their parents, principal and one curriculum teacher. -Gather information around school-pictures, exhibit, awards etc			
Description of Sample and Sample Size			
Number of Schools Involved : one Secondary Provide names of schools (if available): [redacted] Secondary School [redacted]			
Schools	Number of Teachers	Number of Pupils	Number of Classes
Primary	NA	NA	NA
Secondary	2	200	1 cohort intake With 6 selected students
Junior Colleges/CI	NA	NA	
Total	2	200	1 cohort intake
Number of visits per school and estimated time of each visit	Date to start the data collection in schools	Date of completion of data collection	
1 visit per week with 2 to 8 hours per visit.	1 st April 2012	30 th Oct 2012	
I agree to the following conditions: 1 To adhere to the original proposed research study. 2 To seek clearance from the Ministry before publishing any of the findings from this study.			
Name: Ong Siew Kim		Signature: 	
Singapore NRIC No.: [redacted]		Date: 16/3/2012	
Correspondence Address: Blk [redacted] Singapore [redacted]		Name of Institution attached to (attach letter of Introduction): Durham University, Durham, UK.	
Tel: [redacted] Fax: [redacted]			
E-mail: slew.kim.ong@[redacted].com.sg			

*Data Administration Centre
Planning Division
Ministry of Education*

Appendix 4: Ministry of Education letter to the case study school principal

	1 North Buona Vista Drive Singapore 138675 Robinson Road P.O. Box 746 Telephone : (65) 68722220 Facsimile : (65) 67755826 Website : www.moe.gov.sg Email : teo_kie_eng@moe.gov.sg leong_choi_peng@moe.gov.sg	
Ministry of Education SINGAPORE		
EDUN N32-07-005	Request No.: RQ74-12(04)	
30 April 2012		
To: Principal of Secondary School		
CASE STUDY ON CHARACTER PARTICIPATION EDUCATION PROGRAMME FOR THE ACADEMICALLY DISINCLINED STUDENTS AT A SPECIALISED SCHOOL		
The Ministry has no objections to the research proposed by Ms Ong Siew Kim, a doctoral student at the Durham University. You may decide whether or not to allow the researcher to conduct the study in your school. If you do, please:		
a) check that the approved research proposal is adhered to;		
b) inform your pupils and teachers that participation in the study is voluntary and they do not need to provide any sensitive information (e.g. name and NRIC No.);		
c) record your school's participation by completing Annex A;		
d) note that the researcher is granted a period of 6 months from the date of this letter to complete the data collection in school.		
2	If you require any clarifications, please contact the researcher at the contact number as stated in the application form.	
3	Thank you.	
Yours faithfully		
		
Teo Kie Eng (Ms) Head, Data Administration 3 Data Administration Centre for Permanent Secretary (Education)		
		Integrity, the Foundation • People, our Focus • Learning, our Passion • Excellence, our Pursuit


Appendix 5: Research instruments to answer research questions

	Research questions	Quantitative instrument	Participants
Main	To what extend are cognitive behavioural elements changes used to negotiate environmental demands for academic engagement after three to four years of CS School schooling?		
1	What are the motivational changes in cognitive and behavioural factors of the students?	44-item MES-HS Questionnaire (Martin, 2012 b)	Freshmen & Graduating students
2	To what extend do the less academic students negotiate academic buoyancy in their resilient to overcome academic failure?	4-item Academic Buoyancy/Coping survey (Martin & Marsh, 2008)	
3	Which aspects of the cognitive and behavioural dimensions do class teachers perceived their students' academic engagement (entry level students compared to graduating cohort)?	10-item Teachers' perception of students' motivation and enjoyment survey (Martin, 2006)	Class-teachers
4	To what extent is student motivational academic outcome related to teacher's enjoyment of teaching?	1-item Teachers' enjoyment of teaching survey (Martin, 2006)	

Note: Emotional Quotient Inventory: Bar-On Youth EQi:YV™ data from school repository for graduating students were integrated with their MES-HS and academic buoyancy data. EQi data were measured at 2-timed point, namely Entry-point (when graduating students were freshmen) and Exit-point (graduating students when this case study research was

Appendix 6: Instrument 44-item MES-HS questionnaire

Office Use Only



Motivation and Engagement Scale – High School

Andrew J. Martin PhD

Dear Student

Welcome to the Motivation and Engagement Scale – High School.

This survey has been given to you to examine your motivation and engagement, how you study, and what you think of yourself as a student.

There are no right or wrong answers. Just make sure that your answers show what you really think about yourself. When answering the questions, if you want to change an answer, just cross it out and circle the answer that you prefer. If you are not sure which answer to circle, just circle the one that is the closest to what you think. You should have only one answer for each question. For the purposes of the survey, it is best that you do not leave out any questions.

If before, during, or after the survey you have any concerns, please talk to your teacher, tutor, counselor, psychologist, or the person who administered this survey.

There are some questions that are very similar to each other. This is not a trick. It is just that this type of survey needs to ask some similar questions in slightly different ways. Just answer them in a way that shows what you really think about yourself.

Thanks for your participation.

Before you start, here is an example:

Disagree Strongly	Disagree	Disagree Somewhat	Neither Agree nor Disagree	Agree Somewhat	Agree	Agree Strongly				
1	2	3	4	5	6	7				
				Disagree Strongly			Agree Strongly			
I work hard at school				1	2	3	4	5	6	7

This student circled Number 6 ('Agree') because he does work quite hard at school. He didn't circle Number 7 ('Agree Strongly') because he doesn't work hard all of the time. He didn't circle Number 5 ('Agree Somewhat') because he works hard most of the time.

Ask your teacher, psychologist, tutor, or counselor if you have any questions. You can now begin.

Surname _____


ID Number _____

Gender (Circle) Female Male

First Name _____

Grade/Year _____

Age _____ years



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Appendix 6: Instrument 44-item MES-HS questionnaire (*continuation*)



Motivation and Engagement Scale – High School

Andrew J. Martin PhD

	Disagree Strongly	Disagree	Disagree Somewhat	Neither Agree nor Disagree	Agree Somewhat	Agree	Agree Strongly
	1	2	3	4	5	6	7
PLEASE CIRCLE ONE NUMBER FOR EACH STATEMENT							
1. If I can't understand my schoolwork at first, I keep going over it until I do	1	2	3	4	5	6	7
2. I feel very pleased with myself when I really understand what I'm taught at school	1	2	3	4	5	6	7
3. When I study, I usually study in places where I can concentrate	1	2	3	4	5	6	7
4. I'm able to use some of the things I learn at school in other parts of my life	1	2	3	4	5	6	7
5. Sometimes I don't try hard at assignments so I have an excuse if I don't do so well	1	2	3	4	5	6	7
6. When I don't do so well at school I'm often unsure how to avoid that happening again	1	2	3	4	5	6	7
7. I feel very pleased with myself when I do well at school by working hard	1	2	3	4	5	6	7
8. Each week I'm trying less and less	1	2	3	4	5	6	7
9. If my homework is difficult, I keep working at it trying to figure it out	1	2	3	4	5	6	7
10. When exams and assignments are coming up, I worry a lot	1	2	3	4	5	6	7
11. Often the main reason I work at school is because I don't want people to think that I'm dumb	1	2	3	4	5	6	7
12. When I get a good mark I'm often not sure how I'm going to get that mark again	1	2	3	4	5	6	7
13. If I try hard, I believe I can do my schoolwork well	1	2	3	4	5	6	7
14. Learning at school is important	1	2	3	4	5	6	7
15. I don't really care about school anymore	1	2	3	4	5	6	7
16. When I get a bad mark I'm often unsure how I'm going to avoid getting that mark again	1	2	3	4	5	6	7
17. When I study, I usually organize my study area to help me study best	1	2	3	4	5	6	7
18. I'm often unsure how I can avoid doing poorly at school	1	2	3	4	5	6	7

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Appendix 6: Instrument 44-item MES-HS questionnaire (*continuation*)



Motivation and Engagement Scale – High School

Andrew J. Martin PhD

Disagree Strongly	Disagree	Disagree Somewhat	Neither Agree nor Disagree	Agree Somewhat	Agree	Agree Strongly
1	2	3	4	5	6	7

PLEASE CIRCLE ONE NUMBER FOR EACH STATEMENT

	Disagree Strongly					Agree Strongly	
	1	2	3	4	5	6	7
19. I worry about failing exams and assignments	1	2	3	4	5	6	7
20. Often the main reason I work at school is because I don't want people to think bad things about me	1	2	3	4	5	6	7
21. I get it clear in my head what I'm going to do when I sit down to study	1	2	3	4	5	6	7
22. I've pretty much given up being involved in things at school	1	2	3	4	5	6	7
23. If I don't give up, I believe I can do difficult schoolwork	1	2	3	4	5	6	7
24. I sometimes don't study very hard before exams so I have an excuse if I don't do so well	1	2	3	4	5	6	7
25. I feel very pleased with myself when what I learn at school gives me a better idea of how something works	1	2	3	4	5	6	7
26. I feel very pleased with myself when I learn new things at school	1	2	3	4	5	6	7
27. Before I start an assignment, I plan out how I am going to do it	1	2	3	4	5	6	7
28. When I'm taught something that doesn't make sense, I spend time to try to understand it	1	2	3	4	5	6	7
29. I've pretty much given up being interested in school	1	2	3	4	5	6	7
30. I try to plan things out before I start working on my homework or assignments	1	2	3	4	5	6	7
31. Often the main reason I work at school is because I don't want to disappoint my parents	1	2	3	4	5	6	7
32. When I study, I usually try to find a place where I can study well	1	2	3	4	5	6	7
33. If I have enough time, I believe I can do well in my schoolwork	1	2	3	4	5	6	7
34. What I learn at school will be useful one day	1	2	3	4	5	6	7
35. I sometimes do things other than study the night before an exam so I have an excuse if I don't do so well	1	2	3	4	5	6	7
36. I'll keep working at difficult schoolwork until I think I've worked it out	1	2	3	4	5	6	7



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Appendix 6: Instrument 44-item MES-HS questionnaire (*continuation*)



Motivation and Engagement Scale – High School

Andrew J. Martin PhD

Disagree Strongly	Disagree	Disagree Somewhat	Neither Agree nor Disagree	Agree Somewhat	Agree	Agree Strongly
1	2	3	4	5	6	7

PLEASE CIRCLE ONE NUMBER FOR EACH STATEMENT	Disagree Strongly						Agree Strongly
37. When I do tests or exams I don't feel very good	1	2	3	4	5	6	7
38. Often the main reason I work at school is because I don't want my teacher to think less of me	1	2	3	4	5	6	7
39. I usually stick to a study timetable or study plan	1	2	3	4	5	6	7
40. If I work hard enough, I believe I can get on top of my schoolwork	1	2	3	4	5	6	7
41. It's important to understand what I'm taught at school	1	2	3	4	5	6	7
42. I sometimes put assignments and study off until the last moment so I have an excuse if I don't do so well	1	2	3	4	5	6	7
43. In terms of my schoolwork, I'd call myself a worrier	1	2	3	4	5	6	7
44. When I study, I usually study at times when I can concentrate best	1	2	3	4	5	6	7

THAT IS THE END OF THE SURVEY

PLEASE CHECK YOU HAVE ANSWERED ALL THE QUESTIONS

THANKS

Appendix 7: Instrument 4-item Academic Buoyancy questionnaire

Academic Buoyancy Items (Andrew J.Martin PhD)										
Disagree Strongly 1	Disagree 2	Disagree Somewhat 3	Neither Agree nor Disagree 4	Agree Somewhat 5	Agree 6	Agree Strongly 7				
PLEASE CIRCLE ONE NUMBER FOR EACH STATEMENT				Disagree Strongly	Agree Strongly					
1.	I'm good at dealing with setbacks (e.g., bad mark, negative feedback on my work).			1	2	3	4	5	6	7
2.	I don't let study stress get on top of me.			1	2	3	4	5	6	7
3.	I think I'm good at dealing with schoolwork pressures.			1	2	3	4	5	6	7
4.	I don't let a bad mark affect my confidence.			1	2	3	4	5	6	7

Appendix 8: Instrument 10-item modified MES-HS Teachers' Questionnaire

Dear Teacher

Welcome to Teacher Measurement 11- item used by Andrew J.Martin PhD, University of Western Sydney, Australia.

This survey has been given to you to gauge your perceptions of student motivation and engagement and your enjoyment of and confidence in teaching.

There is no right or wrong answers. Just make sure that your answers show what you really think about yourself as a teacher at Northlight School. Just circle the answer that you prefer. If you are not sure which answer to circle, just circle the one that is the closest to what you think. You should have only one answer for each question. For the purposes of the survey, it is best that you do not leave out any questions.

If before, during, or after the survey you have any concerns, please let me know.

There are some questions that are very similar to each other. This is not a trick. It is just that this type of survey needs to ask some similar questions in slightly different ways. Just answer them in a way that shows what you really think about your perceptions of student motivation and engagement and your enjoyment of and confidence in teaching.

Thanks for your participation.

Circle your response as an example:

Disagree Strongly 1	Disagree 2	Disagree Somewhat 3	Neither Agree nor Disagree 4	Agree Somewhat 5	Agree 6	Agree Strongly 7
---------------------------	---------------	---------------------------	------------------------------------	------------------------	------------	------------------------

Do let me know if you have any questions:

Surname _____

First Name _____

Gender(circle):

Female

Male

Age _____ years

Thank you

Ong Siew Kim; Mobile: [REDACTED]; siew_kim_ong@[REDACTED].com.sg



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Planning Division
Ministry of Education

**Appendix 8: Instrument 10-item modified MES-HS Teachers' Questionnaire
(continuation)**

Teacher Measurement (Andrew J.Martin PhD)

Disagree Strongly 1	Disagree 2	Disagree Somewhat 3	Neither Agree nor Disagree 4	Agree Somewhat 5	Agree 6	Agree Strongly 7				
PLEASE CIRCLE ONE NUMBER FOR EACH STATEMENT				Disagree Strongly	Agree Strongly					
1.	Most students in my class believe they can do a good job on their schoolwork.			1	2	3	4	5	6	7
2.	Most students in my class believe that what they are taught at school is important and useful.			1	2	3	4	5	6	7
3.	Most students in my class are focused on learning and improving more than competing and being the best.			1	2	3	4	5	6	7
4.	Most students in my class plan how they will do their schoolwork and check how they are going as they do it.			1	2	3	4	5	6	7
5.	I believe most students in my class use their study time well and try to study under conditions that bring out their best.			1	2	3	4	5	6	7
6.	Most students in my class persist at their schoolwork even when it is challenging or difficult.			1	2	3	4	5	6	7
7.	A number of students in my class mainly do their schoolwork to avoid failure or disapproval from parents or teachers.			1	2	3	4	5	6	7
8.	A number of students in my class get quite anxious about their schoolwork and tests.			1	2	3	4	5	6	7
9.	A number of students in my class do not think they have much control over how well they do at school.			1	2	3	4	5	6	7
10.	A number of students in my class seem to reduce their chances of doing well—for example, waste time, not study, disrupt others, procrastinate, etc''			1	2	3	4	5	6	7
11.	On the whole, I enjoy being a teacher.			1	2	3	4	5	6	7

.....End-of-Survey.....

Appendix 9: Instructions on students' score management

You should have been supplied with a Microsoft Excel file for electronic entry of data.

Before proceeding, ensure that this file is in good order with all the required columns with the appropriate column headings and question number.

Every item for every respondent needs to be entered into Excel.

The Excel template is quite straightforward but there will be decisions to make as data is entered. To guide these decisions, here are a few suggestions (though it is you who will decide the most appropriate approach):

- Enter respondents' names in CAPS
- Leave a cell blank if a respondent has not answered a question
- If a respondent circles two numbers on the same question separated by one number (ie. he/she circles a 2 and a 4, or a 4 and a 6), then enter the number in the middle (ie. enter 3 where they circled a 2 and a 4) because we can guess their intentions
- If a respondent circles two numbers on the same question separated by two or more numbers (ie. he/she circles a 2 and a 5, or a 4 and a 7), then leave it blank because we can't be so confident of their intentions
- If a respondent circles two numbers next to each other (eg. a 2 and a 3), enter the number closer to the mid-point (ie. the 3)
- If a respondent circles three numbers next to each other (eg. 2, 3, 4) then enter the number in the middle (ie. the 3)
- If there is a *pattern* of half a page or more – eg. they circle only 6s for half a page, or they do a zig-zag pattern of responding for half a page or more – do not enter any data after the 9th response
- If a respondent only answers part of the survey, enter what they have done. But they can only receive a final score for a subscale if they have answered 3 or more items on that

subscale. In the case of partial completion, you might like to talk to the respondent about completing the survey or doing it again

- At the end of each page entered, check you are at the correct column (the column name in Excel should indicate the question label and number)
- If for any reason you suspect they have not answered the survey seriously, you might like to talk with them to check this is the case and offer them the opportunity to do it again seriously

Your version of the data entry Excel template may automatically transform the item sets to scores /100 – if this is the case, it is your responsibility to ensure that these calculations are correct (calculation fields in Excel can change).

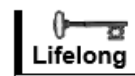
Ensure that respondents only receive a final score for a subscale when they have answered 3 or more of the 4-item sets. If they answer less than 3 items in any given set, they should not receive a final score for that set.

Appendix 10: Tabulation of students' and teachers' answers on excel spreadsheet (example)

The screenshot shows an Excel spreadsheet with the following structure:

- Columns:** A through AA (44 columns). Column A contains student IDs, B contains names, and C through AA contain item IDs.
- Rows:** Each row represents a student's answers for all 44 items. The items listed in column C include:
 - ITEM 1: PRIORITY
 - ITEM 2: D CODE
 - ITEM 3: BELIEF
 - ITEM 4: PLAN
 - ITEM 5: PRIORITY 1
 - ITEM 6: LEARNING 2
 - ITEM 7: TASK 3
 - ITEM 8: VOLUME 8
 - ITEM 9: EMPLOYEE 8
 - ITEM 10: CONTROL 8
 - ITEM 11: LEARNING 7
 - ITEM 12: DENGAR 8
 - ITEM 13: PRIORITY 8
 - ITEM 14: ANXIETY 18
 - ITEM 15: PRIORITY 11
 - ITEM 16: CONTROL 13
 - ITEM 17: SELF BELIEF 13
 - ITEM 18: VOLUME 14
 - ITEM 19: DENGAR 15
 - ITEM 20: CONTROL 18
 - ITEM 21: TASK 17
 - ITEM 22: CONTROL 18
 - ITEM 23: ANXIETY 18
 - ITEM 24: PRIORITY 20
 - ITEM 25: PLAN 22
 - ITEM 26: DENGAR 22
 - ITEM 27: BELIEF 23
 - ITEM 28: EMPLOYEE 24
 - ITEM 29: LEARNING 25
 - ITEM 30: LEARNING 28
 - ITEM 31: PLAN 27
 - ITEM 32: PRIORITY 28
 - ITEM 33: DENGAR 28
 - ITEM 34: PLAN 30
 - ITEM 35: PRIORITY 31
 - ITEM 36: TASK 32
 - ITEM 37: BELIEF 33
 - ITEM 38: VOLUME 34
 - ITEM 39: EMPLOYEE 38
 - ITEM 40: PRIORITY 38
 - ITEM 41: ANXIETY 37
 - ITEM 42: PRIORITY 38
 - ITEM 43: PLAN 38
 - ITEM 44: BELIEF 48
 - ITEM 45: VOLUME 41
 - ITEM 46: EMPLOYEE 43
 - ITEM 47: ANXIETY 48
 - ITEM 48: PLAN 44
 - ITEM 49: PRIORITY 44
 - ITEM 50: CONTROL 44
 - ITEM 51: TASK 44
 - ITEM 52: CONTROL 44
 - ITEM 53: ANXIETY 44
 - ITEM 54: PRIORITY 44

Appendix 11: MES-HS Dimension with 4-item each factor



BOOSTER GROUPINGS AND ITEMS

Self belief	
Q13	If I try hard, I believe I can ...
Q23	If I don't give up, I believe I can ...
Q33	If I have enough time, I believe I can ...
Q40	If I work hard enough, I believe I can ...

Valuing	
Q4	I'm able to use some of the things I learn ...
Q14	Learning at school is ...
Q34	What I learn at school ...
Q41	It's important to understand what ...

Learning focus	
Q2	I feel very pleased with myself when I really ...
Q7	I feel very pleased with myself when I do ...
Q25	I feel very pleased with myself when what I ...
Q26	I feel very pleased with myself when I learn ...

Planning	
Q21	I get it clear in my head ...
Q27	Before I start an assignment, I ...
Q30	I try to plan things out before I ...
Q39	I usually stick to ...

Task management	
Q3	When I study, I usually study ...
Q17	When I study, I usually organize ...
Q32	When I study, I usually try to ...
Q44	When I study, I usually study at ...

Persistence	
Q1	If I can't understand my schoolwork ...
Q9	If my homework is difficult, I ...
Q28	When I'm taught something that ...
Q36	I'll keep working at difficult ...

Appendix 11: MES-HS Dimension with 4-item each factor (*continuation*)

MUFFLER GROUPINGS AND ITEMS

Anxiety	
Q10	When exams and assignments are ...
Q19	I worry about ...
Q37	When I do tests ...
Q43	In terms of my schoolwork ...

Failure avoidance	
Q11	Often the main reason I work at school is because I don't want people to think that ...
Q20	Often the main reason I work at school is because I don't want people to think bad ...
Q31	Often the main reason I work at school is because I don't want to ...
Q38	Often the main reason I work at school is because I don't want my ...

Uncertain control	
Q6	When I don't do so well at school ...
Q12	When I get a good mark I'm ...
Q16	When I get a bad mark I'm ...
Q18	I'm often unsure how ...

GUZZLER GROUPINGS AND ITEMS

Self-sabotage	
Q5	Sometimes I don't try ...
Q24	I sometimes don't study ...
Q35	I sometimes do things ...
Q42	I sometimes put ...

Disengagement	
Q8	Each week I'm ...
Q15	I don't really ...
Q22	I've pretty much given up being involved ...
Q29	I've pretty much given up being interested ...

Appendix 12: Tabulation of graduating student EQi scale scores on an excel spreadsheet

Name code	Ethnicity	Gender	Intrapersonal	Interpersonal	Stress Mangement	Adaptability	General mood		Freshmen	Intrapersonal	Interpersonal	Stress Mangement	Adaptability	General mood	
S1	Chinese	Female	102	76	97	78	88		G-S Px-1	90	76	121	66	105	
S2	Malay	Male	95	84	96	92	104		G-S Px-1	91	87	115	79	99	
S3	Indian	Female							G-S Px-2	94	121	81	117	117	
S4	Other	Male	97	117	90	112	118		G-S Px-2	113	108	106	97	123	

Appendix 13: Comparative study: measurement on enjoyment of teaching

Table 4. Means, SDs, t-values, and effect sizes testing for teacher gender effects and school level effects.

	Teacher's gender				School level			
	Mean / 7 (SD)		t	Effect size	Mean / 7 (SD)		t	Effect size
	Female	Male			Primary	High		
<i>Adaptive cognitions</i>								
Self-efficacy	5.14 (1.12)	5.28 (.97)	2.09*	.13	5.51 (1.02)	5.19 (1.04)	2.96**	.32
Valuing of school	4.67 (1.24)	4.88 (1.11)	2.80**	.18	5.19 (1.04)	4.72 (1.19)	3.81***	.42
Mastery orientation	4.61 (1.35)	4.57 (1.27)	.38	—	4.87 (1.19)	4.58 (1.32)	2.15*	.23
<i>Adaptive behaviours</i>								
Planning	3.67 (1.36)	3.76 (1.12)	.95	—	3.85 (1.29)	3.71 (1.35)	.98	—
Study management	3.96 (1.35)	4.16 (1.29)	2.18*	.15	4.65 (1.18)	4.03 (1.34)	3.90***	.37
Persistence	4.53 (1.33)	4.60 (1.20)	.85	—	4.91 (1.22)	4.54 (1.29)	2.77**	.30
<i>Impeding dimensions</i>								
Anxiety	5.04 (1.31)	4.96 (1.27)	.85	—	4.68 (1.38)	5.02 (1.28)	2.51*	.26
Failure avoidance	4.68 (1.21)	4.58 (1.18)	1.22	—	4.43 (1.17)	4.66 (1.19)	1.86	—
<i>Maladaptive dimensions</i>								
Uncertain control	4.33 (1.36)	4.00 (1.38)	3.68***	.24	3.91 (1.32)	4.18 (1.38)	1.88	—
Self-handicapping	4.86 (1.39)	4.72 (1.40)	1.61	—	4.44 (1.44)	4.81 (1.38)	2.59**	.26
<i>Outcome variables</i>								
Enjoyment	6.13 (.79)	6.10 (.89)	.44	—	6.19 (.83)	6.09 (.84)	1.09	—
Confidence	5.72 (.71)	5.63 (.65)	1.06	—			N/A	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; N/A: Surveys to primary school teachers did not include confidence items.
 Note. No significant multivariate interaction between gender and school level, $F(10,782) = .98$, $p = ns$.

Source: (Martin, 2006a, p. 82) *The relationship between teachers' perceptions of student motivation and engagement and teachers' enjoyment of and confidence in teaching*, Asia-Pacific Journal of Teacher Education. 34 (1), 73-93.

Appendix 14: MES-HS dimension factors scores of Chinese mainstream students

	CHINESE STUDENTS						AUSTRALIAN STUDENTS					
	Mean	SD	Skew	Kurtosis	Cronbach's α (# of items)	CFA Loadings Range (Mean)	Mean	SD	Skew	Kurtosis	Cronbach's α (# of items)	CFA Loadings Range (Mean)
Adaptive cognition												
Self-efficacy	5.51	1.09	-1.03	1.57	.81 (4)	.63-.81(.72)	5.77	.98	-1.09	1.48	.77 (4)	.59-.74(.68)
Valuing	5.43	1.01	-1.02	1.45	.84 (4)	.48-.78(.67)	5.95	.93	-1.39	2.49	.75 (4)	.52-.75(.66)
Mastery orient	5.67	1.07	-.64	.16	.76 (4)	.68-.85(.75)	5.84	.98	-1.17	1.68	.82 (4)	.66-.80(.73)
	HIGHER ORDER ADAPTIVE COGNITION LOADINGS						HIGHER ORDER ADAPTIVE COGNITION LOADINGS					
	Range = .83-.99; Mean = .90						Range = .86-.91; Mean = .89					
Adaptive behavior												
Planning	4.25	1.13	-.17	.10	.72 (4)	.49-.78(.64)	4.52	1.29	-.34	-.28	.77 (4)	.58-.76(.69)
Task management	4.64	1.06	-.31	.31	.72 (4)	.54-.70(.63)	5.03	1.33	-.64	-.07	.83 (4)	.69-.85(.75)
Persistence	4.80	1.13	-.63	.60	.83 (4)	.68-.79(.74)	5.10	1.10	-.64	.30	.78 (4)	.56-.77(.68)
	HIGHER ORDER ADAPTIVE BEHAVIOR LOADINGS						HIGHER ORDER ADAPTIVE BEHAVIOR LOADINGS					
	Range = .83-.95; Mean = .90						Range = .84-.90; Mean = .87					
Impeding cognition												
Anxiety	4.48	1.25	-.23	-.17	.71 (4)	.58-.70(.62)	4.07	1.40	-.04	-.56	.76 (4)	.64-.70(.67)
Failure avoidance	3.52	1.37	.09	-.52	.79 (4)	.56-.78(.71)	3.17	1.47	.46	-.52	.82 (4)	.61-.85(.73)
Uncertain control	3.98	1.16	.02	.02	.70 (4)	.53-.71(.61)	3.48	1.33	.11	-.59	.77 (4)	.60-.73(.68)
	HIGHER ORDER IMPEDING COGNITION LOADINGS						HIGHER ORDER IMPEDING COGNITION LOADINGS					
	Range = .70-.83; Mean = .76						Range = .63-.85; Mean = .73					
Maladaptive behavior												
Self-handicapping	2.97	1.27	.43	-.09	.80 (4)	.57-.78(.71)	2.75	1.32	.60	-.25	.80 (4)	.62-.76(.71)
Disengagement	2.78	1.24	.70	.26	.81 (4)	.61-.82(.73)	2.19	1.17	1.22	1.27	.80 (4)	.61-.81(.71)
	HIGHER ORDER MALADAPTIVE BEHAVIOR LOADINGS						HIGHER ORDER MALADAPTIVE BEHAVIOR LOADINGS					
	Range = .70-.85; Mean = .78						Range = .70-.89; Mean = .80					

Source: Martin & Hau, (2010, p. 281). *Achievement Motivation among Chinese and Australian School Students: Assessing Differences of Kind and Differences of Degree*, International Journal of Testing, 10:3, 274-294

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