

THESIS SERIES

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Design of Didactic Games to Foster Student Motivation, Engagement and Performance in Classrooms: A Case of Hong Kong Primary English Language Subject (ELS) Classrooms

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Research conducted in formal and routine classrooms reveals that children lack motivation, attention, and concentration during learning. This research aims to address this problem by adopting "learning through didactic games" as a child-centred pedagogical approach within the context of Hong Kong's local primary schools. This study comprises three major phases. The first two phases involve a series of literature reviews and in-depth case studies on several teaching/ learning scenarios within local Hong Kong's primary ELS classrooms. Afterwards, four "learning through didactic games" experiments are conducted, which reflect on how the design of didactic games can guide and steer tactile gualities, sensory aesthetics, educational goals, defined rules, and evaluation in didactic games. These insights are then translated into a logical, empirical framework highlighting ten crucial factors for 'designing' didactic games for classroom use. This research contributes to the field of game design and education. It is valuable to educators and game designers that motivate them to adopt, test and explore this approach within other socio-cultural contexts.

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DESIGN OF DIDACTIC GAMES TO FOSTER STUDENT MOTIVATION, ENGAGEMENT AND PERFORMANCE IN CLASSROOMS: A CASE OF HONG KONG PRIMARY ENGLISH LANGUAGE SUBJECT (ELS) CLASSROOMS

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SCHOOL OF DESIGN

Design of Didactic Games to Foster Student Motivation, Engagement and Performance in Classrooms: A Case of Hong Kong Primary English Language Subject (ELS) Classrooms

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A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy

August, 2014

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Abstract

Research studies conducted within formal, routine classrooms reveal that children lack motivation, attention and concentration during learning. Gradually, this leads to apathy, anxiety and often results in poor academic performance, low self-esteem and passiveness towards education. Most educators are comfortable and affluent in formal, instruction-based, mainstream pedagogy. When interviewed, they state that they are often preoccupied with enormous tasks associated with classroom instruction. They constantly face the pressure to impart defined knowledge (content) and achieve intended learning targets within limited lesson time and strict curriculum deadlines. This voluntarily or involuntarily, obstructs them from practicing new, interesting, seemingly time and energy consuming alternative (learner-centred) pedagogy. Do schools envision education as a rich, fostering process or as training the bulk (of children) as assumed replicas by emphasizing on convenience driven, instruction-based, unidirectional teaching? Present day classrooms are highly complex and heterogeneous. Every child is unique. Classroom instructions must nurture the growing needs of this diversity of learners. I aim to address this problem by adopting "learning through didactic games" as a child-centred pedagogical approach within the context of Hong Kong local Primary schools. In Hong Kong, learner-centred rationale in education is a young, developing trend. This research unfolds itself in three major phases. First, the literature review draws light on the essential ingredients needed for understanding and studying Primary kids (ages 6-11). It provides "food for thought" for a theoretical based argument on the significance and alliance of motivation, meaningful learning and flow in education through play and games. In the second phase, an in-depth case study draws attention on several teaching/learning scenarios within local Hong Kong Primary ELS classrooms. This investigation takes place within the sociocultural context of a Hong Kong local Primary school-Sham Tseng Catholic Primary School. It helps in identifying core issues and challenges faced by teachers and students during the teaching/learning of English Language Subject (ELS) within P.4 and P.5 classrooms. In the third phase, these core issues have been analysed and addressed through four main "learning through didactic games" experiments. The experiments have been designed in synchronization with the Hong Kong Primary English language curriculum and are conducted within the naturalistic settings of five P.4 and four P.5 English classrooms. They not only provide empirical evidence and valuable insights on how to improve the quality of teaching/learning experiences for both, teachers and students through 'the design' of didactic games, but also act as a valuable pedagogical resources for future use. The emphasis on 'design' is used to create distinct, primary functions of didactic games in education such as a sensory stimuli; an ability-paced, interest-driven learning experience; collaborative play; information processing strategy; and lastly as a formative assessment tool. It reflects on how the design can guide and steer tactile qualities, sensory aesthetics (game-components); educational goals (game-targets); defined rules (game-play experience and interactions); and evaluation (learning outcome) in didactic games. Towards the end of this dissertation, these insights have been translated into a logical empirical framework that highlights ten crucial factors for 'designing' didactic games for classroom use. This new knowledge contributes to the fields of game design and education. This research intends to be of value to educators and game designers and motivates them to adopt, test and explore this approach within other sociocultural contexts.

Author's Publications

(Referenced in this study)

(A) Refereed Conference Presentations

Gupta, P. (2014). "English lessons are Fun!" Teaching and Learning through Didactic Games within Hong Kong P.4 Classrooms. Paper presented at 4th International English Language Teacher Educator Conference, 21-23 February 2014 at Hyderabad, India.

Gupta, P. (2013). Understanding 'Gameness' within the SCRABBLE® Family of English Word Games. In Proceedings of the 7th European Conference on Game Based Learning, 645-655, 3-4 October 2013. Porto, Portugal, Instituto Superior de Engenharia do Porto (ISEP).

Gupta, P. (2012). Schools as Interactive Playgrounds: An Investigative Study of Hong Kong Primary Classroom Pedagogy. In Proceedings of the 6th European Conference on Game Based Learning, 582-590, 4-5 October 2012. Cork, Ireland, the University College Cork and the Waterford Institute of Technology.

(B) Refereed Game Presentations & Extended Abstract

Gupta, P. (2013). Hong Kong on Wheels: A case study of learning/teaching of English vocabulary and specific language focus through cooperative-parallel play-based board games within Hong Kong P.5 Classrooms. The game 'Hong Kong on Wheels' was among the Finalists at the Game Competition at the 7th European Conference on Game Based Learning, 3-4 October 2013. Porto, Portugal, The Instituto Superior de Engenharia do Porto (ISEP).

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List of Abbreviations

- ELS English Language Subject
- EFL English as Foreign Language
- **GBL** Game Based Learning
- HK– Hong Kong
- PBL Play Based Learning
- P-P-P Present Practice Produce
- P.4 Primary four
- P.5 Primary five
- STCPS Sham Tseng Catholic Primary School
- TBL Task Based Learning
- QL Qualitative (research)
- QN Quantitative (research)
- **ZPD** Zone of Proximal Development

Chapter 1: Introduction

The Chapter one provides a comprehensive overview of this research study. It builds on retrospective personal experiences and unfolds the inspirational motives for conducting a formal exploration and systematic inquiry into the realm of didactic games in Hong Kong Primary ELS classrooms. The intention of this research has been elucidated from seven key aspects such as personal motivation; identifying the problem; intended objectives of the research; the context and scope of this study; the research purpose, significance; and lastly, research contribution.

1.1 Motivation

The initial eight years of my life were deeply rooted in the Asian (Indian) education system. My parents and teachers consciously or unconsciously, encouraged me to exert more time and effort in academics, both, at home and in school environment. They always emphasized on formal education over learning through spontaneous play and games. Most Asian adults often perceive a kid's spontaneous play as a non-serious, trivial, fun-oriented or recreational activity, separate from academic learning. I, as a child gradually developed a notion of play and learning (non-play or work) as two separate domains in life.

In mid 1990s, we relocated to Yanbu, a small industrial town on the west coast of Kingdom of Saudi Arabia. While spending two significant years of my schooling (P.6 and S.1) in an American International curriculum, I gained first-hand experience of 'play as learning'. My predefined peripheries of play and education (as work) began to merge. The escape from a monotonous, teacher centred instruction and a highly exam-dominated curriculum helped me to experience and enjoy my learning process through interesting, self ability-paced and child centred methodologies. Acquiring new knowledge and skills through play and games was motivational and exciting. These first-hand valuable experiences triggered conflicting thoughts in my mind – Is it 'play vs. learning' or 'play as learning, learning as play?'

This set me on a vital quest to explore and enquire – How can classroom learning be made enjoyable, yet meaningful? Why don't educators encourage and practice 'play as learning, learning as play' within Asian classroom instruction? Why do most of us have separate notions of education (as work) and play? Is education (learning) separate from play?

For any child, play is work and we as adults, can make it purposeful (Montessori, 1913). John Dewey (1915) suggests that play and work are inseparable, as play focuses more on the process, while work focuses more on results; and both must be integrated together into a curriculum as a unified whole.

My Secondary 2 (S.2) schooling marked my return to the Asian (Indian) education system, wherein I caught myself into the intricate web of 'drill and kill'. In the competitive race of achieving higher academic scores and fulfilling family expectations, the essence of having a meaningful, enjoyable

learning experience was over-shadowed. I sustained myself by either adopting memorization (learn-by-heart) techniques, or else gradually developed apathy towards the subject matter. Do educators envision students to have a similar kind of experience about classroom instruction?

My curiosity and interest in educational games re-surfaced and revived during my master's study. In a 10-weeks academic module, our team of three students was given a game-design project to design a simple, educational game for Secondary 1 students, based on Indian Geography curriculum. While closely working with/for S.1 children and teachers, we realized a great potential for teaching and learning through didactic games within classrooms and the need for its unfolding within societies wherein it's still a new, developing trend. While conceptualizing a simple card game, I faced the challenge of effectively converging knowledge (what to learn) to pedagogical methodology (how to learn). This was my first formal introduction to game design (components, aesthetics, ergonomics); understanding game-play (rules, game-mechanics, winning aspects); and how to teach intended learning goals to target learners through educational games.

Post this academic project, my interest and motivation towards didactic games grew exponentially. The Ph.D research study bestows on me a valuable opportunity to pursue my interests - play and didactic games. This dissertation provides 'food for thought' to conduct a systematic and in-depth inquiry on adopting 'learning through didactic games' approach (within the Hong Kong Primary education system) and later, monitoring its influence on student motivation, engagement and performance.

1.2 The Problem

Children are curious and enthusiastic to know and to learn about 'things' that grab their attention or triggers interest. Curiosity is defined as a positive emotional-motivational trait (Kashdan, Rose, & Fincham; 2004). It either inclines an individual to voluntarily seek and explore personal interests (Deci, 1975); or identify and get absorbed into alternate, novel and challenging opportunities (Kashdan, Rose, & Fincham; 2004). Factors instigating curiosity are novelty, complexity, uncertainty, incongruity, surprise, conceptual conflict and challenge (Arnone, 2003).

Curiosity often results in specific and or diverse exploration (Berlyne, 1960). Diverse exploration is actively searching for new, multiple opportunities and sources of stimuli (Berlyne, 1960, 1967, 1971; Day, 1971; Krapp, 1999). In contrast, specific exploration relates to actively seeking depth in one's

(own) knowledge and experience, by focussing on a specific activity or stimulus (Berlyne; 1960, 1967, 1971).

Shernoff & Csikszentmihalyi (2008) observed that most student behaviours within formal classrooms reflect passiveness, apathy and anxiety (in extreme cases) towards learning. Children tend to feel lost or out of place and eventually get detached from seemingly mass-oriented education system (Larson & Richards, 1991). Their minds deviate and wander on other trivial things. Gradually, they conceive learning as a mundane, insignificant, and a routine activity. If children commence their learning journey with curious minds and enormous enthusiasm, then why do they gradually tend to lack motivation and concentration towards formal education?

Fostering student motivation, enjoyment and meaningful experiences in learning is the prominent concern and an on-going challenge in classroom teaching (Scrimsher & Tudge, 2003; Shernoff & Csikszentmihalyi, 2008). To motivate an individual to learn can be defined as providing with adequate stimuli in order to facilitate his/her active engagement during the process of acquiring knowledge (Keller, 1987). Children need enjoyable and immersive learning experiences (Amory et al., 1999; Garris et al., 2002; Gee, 2003; Mitchell and Savill-Smith, 2005; de Freitas et al., 2006). Games can provide a new potential for creativity and innovation in classroom instruction (de Freitas, 2006).

Despite the varied, significant contributions made in theoretical and empirical researches carried out within classrooms, there is an on-going need to define an empirical framework for a meaningful symbiosis of teaching and learning experiences through the design of didactic games.

1.3 Overview

1.3.1 Hypothesis:

Teaching/learning through didactic games in classrooms can foster student motivation, engagement and performance.

1.3.2 Research Questions

In this dissertation, I aim to address: How to improve the quality of teaching/learning experiences through didactic games? Based on this conception, I further investigate on how can didactic games

nurture student motivation, engagement and performances?

The three sub-questions that have guided this study are:

- 1) What kinds of learning challenges do primary kids (ages 8-10) face in ELS classrooms?
- 2) What are the core factors for designing didactic games for Primary ELS classrooms?
- 3) How to measure and evaluate students' performances during such didactic games?

1.3.3 Research Objectives

The objectives of my research can be categorized into three phases:

PHASE 1: The research begins by identifying a local primary school environment and observing the routine life within the naturalistic environment. A pilot study helps me to understand the diverse methodologies and learning objects that are adopted within P.1-P.6 ELS classrooms. A preliminary game experiment is conducted among P.5 students. This experiment provides insights on students' diverse attitudes and feedback on learning through this didactic game.

PHASE 2: The second stage focuses on conducting an in-depth case study in nine P.4-P.5 ELS classrooms. This involves identifying and analysing the challenges faced by diverse learners within ELS classrooms. Personal insights are extracted from participant field observations and by conducting individual semi-structured interviews of nine (P.4 and P.5) English teachers. This knowledge defines the periphery of regular classroom pedagogy and develops a holistic understanding on diverse learners' abilities and capabilities; individualistic teaching styles; lesson planning and structures.

In coherence, I closely examine on-going ELS classroom instructions for one academic year and study the structure of Hong Kong ELS curriculum goals and objectives. Consequently, I design, develop and test four instruments - new didactic games, (two for each) for P.4 and P.5 ELS classrooms. These four experiments are based on specific chapters of P.4 and P.5 Longman Elect ELS textbook. They are conducted in synchronization with ongoing lesson plan. They aim to test both, the players' and teachers' motivation, comfort level and reaction to integrating didactic games within ELS classrooms.

Relevant feedbacks on student motivation, performance, and engagement are documented through real-time performance oriented tasks; evaluation worksheets; students' questionnaire

surveys and teachers' individual semi structured interviews. These help me to identify the crucial factors for designing and developing didactic games for Hong Kong ELS classrooms.

PHASE 3: Based on the identified crucial factors, I aim to propose a new empirical framework for designing and developing instruments for 'learning through didactic games' approach in context to Hong Kong Primary ELS classrooms.

1.3.4 Research Outline

To begin with, **Chapter 1** provides a holistic overview of the entire research. It provides a narration on personal motivation; identifying the problem; research aims and objectives; the context and scope of study; and draws light on the significance, purposes and intended contribution of this research.

In **Chapter 2**, the literature review highlights the core ingredients (education, learning, play, didactic games, flow, child development and psychology) needed for a significant theoretical discussion. This section explains general concepts associated with the terms and their significance in context to this research study. This profound, theoretical knowledge helps build an argument that clearly defines my research's intended goal.

The **Chapter 3** outlines the research methodology and highlights the purposes for adopting sequential exploratory (instrument development) mixed method research design.

The **Chapter 4** comprises of three parts. The first part discusses the research findings during a pilot study, conducted within P.1-P.6 ELS classrooms at Sham Tseng Catholic Primary School (STCPS), Hong Kong. The second part, builds on insights gathered from the pilot study. It helps in identifying the limitations and defining the scope of this research within the naturalistic environment. The third part provides a detailed analysis on the Hong Kong ELS curriculum. The parallel alignment of all three parts in Chapter 4 (as content and context) is vital, for understanding the correlations between curriculum goals, objectives and classroom instruction.

The **Chapter 5** describes the intensive main-study conducted within nine P.4 and P.5 ELS classrooms in STCPS. Four game based experiments (two at each level of P.4 and P.5) are designed, developed and tested in synchronization with the ongoing lesson plan and schedule. A detailed study of the

Primary ELS textbook helps in defining the structure of ELS lessons and also in identifying the scope for integrating didactic games within the classroom instruction.

The **Chapter 6**, highlights the findings based on students' questionnaires survey; students' performance analysis through assessments; and semi-structured teachers' interviews. These in cohesion with insights gathered from four game experiments help to identify the crucial factors for facilitating optimal teaching/learning experiences through didactic games. An empirical framework (based on these identified crucial factors) is proposed and discussed in detail. This framework aims to help educators understand "how to facilitate optimal teaching/learning experiences in ELS classrooms through didactic games". One didactic game is re-designed and tested to provide evidence to support this framework in context to real life scenarios within Hong Kong Primary ELS classrooms.

Towards the end, **Chapter 7** summarizes on main ideas gathered in this study. Furthermore, it draws attention on the limitations of this research, position and provides suggestions on the scope for further research.

The Figure 1 clearly outlines and guides the research flow through a simple, visual, representational framework, consisting of seven, legibly structured, progressive chapters.

CHAPTER 1

Introduction Motivation Identifying the problem Research aims and objectives Defining the context and scope of study Significance, Purposes and Contribution





Literature Review

CHAPTER 2

General concepts, significances and inter-relationships between core aspects (flow, education, learning, play, didactic games, child development and child psychology)



Goal

To develop an instrument that supports a new empirical framework, thus facilitating motivation, engagement and performance in ELS classroom by teaching/learning through didactic games.

support

Research Methodology (Reasons for adopting exploratory sequential mixed method design)

CHAPTER 4

CHAPTER 3

Pilot study: Case study at STCPS (ELS classrooms), Hong Kong

1) Conducting field observation in ELS lab (P.1-P.3) and P.4-P.6 ELS classrooms

- 2) Identifying limitations/scope of didactic games within P.5 ELS classroom
- 3) Conducting a preliminary game-experiment in P.5 ELS classroom
- Studying Hong Kong ELS Curriculum (objectives, goals, assessments, PPP to TBL)

CHAPTER 5

Main study: Case study at STCPS (P.4-P.5 ELS classrooms), Hong Kong

Conducting field observation, conducting four field experiments in nine P.4-P.5 ELS classrooms
Studying Hong Kong Primary English textbook pattern (Longman Elect textbook)

CHAPTER 6

......

Gather feedback from P.4-P.5 ELS (individual, semi structured teachers'interviews + students' assessments, questionnaire survey) Identification of variables/factors for instrument development Development of empirical framework (For optimal teaching and learning experiences through didactic games)

Design, develop one instrument (didactic game) Implementation

empirical

evidence

CHAPTER 7

Conclusion

Summary, limitations, scope and future work

1.4 Context of study

From a cultural-historical-political standpoint, the Hong Kong education system is an amalgamation of British and Chinese influences. Post the reunification with People's Republic of China in 1997, the Hong Kong Government has adopted a "bi-literate and trilingual" policy with the aim of enabling Hong Kong residents to become bi-literate in written Chinese and English, and trilingual in Cantonese, Putonghua and spoken English (Law). Hong Kong is culturally rich, diverse and a highly competitive society (Murad, 2011), and this is reflected in their intense and rigorous education system.

Assessments and examinations are deeply rooted in Chinese culture and both reflect an individual's positive qualities such as hard work, perseverance and determination (Zeng, 1999). Schools, students and parents take each assessment quite seriously. The Hong Kong Primary schools conduct one major test and one examination for each subject twice an academic year (Carless & Lam, 2012). These assessments are often preceded by a series of internal evaluations, quizzes and mock tests. A student's potential is evaluated based on self-academic capabilities and performance. Most parents and teachers are quite critical and tend to closely monitor a child's performance. They encourage students to attend extra-lessons (within schools or tutorial schools) in order to improve and or refine their academic skills. In the spirit of being an all-rounder, many students pursue diverse, extra-curricular competencies after regular schooling, such as arts, sports, and performing arts.

Assessment is a sociocultural construct and it influences the way students perceive and experience it (Gipps, 1999). High academic achievers associate assessment with recognition and achievement, while the academically weaker students associate it with fear of punishments, embarrassment and failure (Pollard & Triggs, 2000). Students are tagged as 'smart' or 'weak' on the basis of their academic performance. High assessment scores often leads to a high, positive self-esteem and pleasure of achievement (Black 1998). Students with lower academic scores tend to have low self-esteem and lack motivation and engagement towards learning (Deakin-Crick & Harlen, 2003; Harlen, 2006). Pong and Chow (2002) observed that most Hong Kong students aim for high academic scores in order to fulfill family expectations, rather than to gain interest or enjoyment in learning. In contrast, enjoyment is a crucial factor in learning, competency, creativity and academic performance (Csikszentmihalyi et al., 1993; Nakamura, 1988).

The onset of the 21st century, Hong Kong reformed its education system in order to sustain the

competition due to globalization and unprecedented needs of the diverse economy (Chan, 2010). Lam (2006) states that the fluidness and flexibility of the new global economy demands individuals to be quick learners and adopt reliable and creative ways of working. The Hong Kong's Reform Proposal Report (2000), states: "The world has changed, so must the education system!" (Reform Proposals endorsed by Mr... Tung Chee Hwa, the former Chief Executive of the HKSAR). Globalization led to the formation of a major educational reform in the academic year 2009/10, called the "334" New Academic Structure (NAS) in Hong Kong (see Chapter 5). Hong Kong educators are keen in adopting alternate, effective child-centred pedagogy to foster student motivation, engagement and higher performance among students, especially academically weaker ones. This provides me with a valuable opportunity to conduct a systematic enquiry to serve the current need for 'learning through didactic games' as a child-centred approach within local Primary ELS classrooms.

1.5 Scope of study

According to Hong Kong Education Bureau (academic year 2012/2013) online database, there are 659 registered primary schools in Hong Kong. Out of these registered Primary schools, 76% are aided schools (503 in number) that follow local curriculum. The Figure 2 provides an overview of different categories of primary schools in Hong Kong.



Figure 2: Categories of Primary schools in Hong Kong

Due to the practical limitations of authoritative access, time and feasibility, my research study focuses on Sham Tseng Catholic Primary School (STCPS), as a case study. The Sham Tseng Catholic Primary School, established in 2009, is an aided, whole-day, coeducational, symmetric local Primary (P.1-P.6) school, situated in Sham Tseng, New Territories region in Hong Kong. The medium of instruction is Chinese (Cantonese). There are 24 classrooms (4 for each level from P.1-P.6) and has a collective strength of 700 (approx.) students.

The Figure 3 illustrates an organisational framework for research scope.



Figure 3: Scope of research study

It reveals the linkages (depicting significant interactions) between the three individual groups: people (target users), learning environment (classroom) and Hong Kong Primary English curriculum (education content and context). As the research unfolds, this framework provides insights on complex interconnections and interactions within these groups. Chinese, Mathematics and English are the three major subjects that dominate the

Hong Kong primary school curriculum (Carless, Lam; 2012). English language is used as a medium of instruction only for teaching ELS within classrooms. Teachers aim to nurture confidence and effective use of English (vocabulary, grammar, language focus and pronunciation) in children during oral and written communications.

The periphery of my research is P.1-P.6 ELS classrooms. It would facilitate feasible communication and supplement two-way interactions with students and teachers.

1.6 Significance, Purposes & Contribution

The primary objective of this research is to provide rewarding teaching/learning experiences for both, learners and educators, in the following ways (Figure 4):

For LEARNERS (AGES 6-11)	For EDUCATORS
To foster enjoyment, motivation, and active participation towards learning	To provide empirical evidence on significance of teaching/learning through didactic games
To facilitate collaborative, interactive learning from/with peers, teachers.	To motivate them to adopt innovative didactic games into classroom pedagogy
To help them understand concepts and lesson content.	To educate the value of 'play as learning, and learning as play'.
To perceive education as valuable, engaging learning experience rather than as a mundane routine.	To perceive education as a dialogic process, not just as formal training. Training is one aspect of education.
To provide adequate stimuli for further inquiry and exploration.	To nurture learning into innovative, comprehensible and meaningful forms.
To comprehend, apply theoretical knowledge in practical experiences created in didactic games.	To balance, correlate theoretical knowledge with practical experiences through engaging means (didactic games)

Figure 4: Purposes and significance of research study

My research contribution can be weighed from two aspects-theoretical value and empirical impact. The theoretical background provides a substantial exposure of relevant knowledge that may be beneficial for individuals conducting research on learning, child development and didactic games. The new, proposed an empirical framework (as new knowledge) helps in defining the core factors for designing and using didactic games for meaningful teaching/learning experiences within classrooms. Four didactic games are designed, tested and analysed, two for each level, within P.4 and P.5 ELS classrooms. They are based on specific chapters from Primary Longman Elect ELS curriculum textbook. These games provide empirical evidence on the potential, significance and impact of teaching/learning through didactic games within ELS classrooms. Also, they can be a valuable, pedagogical resource for teachers across other schools for future use.

The design of these didactic games aims to address problems relating to nurturing student motivation, engagement and learning performance. Design is used as the core principle to create distinct, primary functions of didactic games in education such as a sensory stimuli; an ability-paced, interest-driven learning experience; collaborative play; information processing strategy; and lastly as a formative assessment tool. Design aids in defining the tactile and sensory components; degree of interaction and communication among the players; target educational goals; mechanics; and governing rules in didactic games.

This research intends to provide exciting stimuli for further investigation and aims to inspire individuals to explore "learning through didactic games" as a value addition for meaningful teaching/learning experiences in other social contexts.

Chapter 2: Literature Review

The Chapter two builds on the intellectual, theoretical knowledge acquired from numerous, significant past academic research works in education, child development and didactic games. This literature review branches out into seven key aspectual terms: school, education, learning, child development, play, games, flow (engagement) and motivation. A theoretical know-how in each aspectual term is requisite and vital, in order to understand and explore their converging properties and relational significances.

"Let's find a way for teachers to teach less and for pupils to understand more." (Comenius, 1954)

2.1 School as a microcosm of a society

The word school originates from Old English *scol*, Latin *scolu*, and Greek *skhole*, meaning 'leisure, philosophy, or place where lectures are given,' reinforced in Mid English by Old French *escole*.

The online Merriam-Webster (2012) dictionary defines school as:

1) An institution for teaching and learning.

2) A place for acquiring knowledge and mental training.

3) To train, give instruction to, in a particular skill or discipline.

4) The process of being educated formally.

5) (Philosophy) a group of people sharing the same or similar ideas, methods, or style "schools of thought".

Schools are fundamental, social institutions providing intentional education (Dewey, 1916) and systematic learning (Vygotsky, 1978). Here, *intentional education* means a conscious, deliberate selection of a special environment (with specific materials and methods) that promotes growth and development of individuals in a desired direction (Dewey, 1916). The term education, originates from the mid-16th century: from Latin *educatio* (n-), *educare* (v) related to *educere* meaning "to lead-out".

The online Merriam-Webster (2012) dictionary defines education as:

1) The act or process of giving or acquiring knowledge systematically, during childhood, adolescence and adulthood.

2) The result produced by instruction, training or study.

3) A body of knowledge acquired in a particular field or subject.

Through the process of education, the mature members of a society transmit and communicate all of their accumulated knowledge, skills and values to the new, immature individuals (Dewey, 1916). Education is conceived as both, knowledge (n.) and a process (v.). Education (n.) as knowledge (what), lies in transmission and in communication whereas, education (v.) as a process (how), lies through transmission and through communication (Dewey, 1916).

In Figure 5, Dewey (1915) visualizes a representational, ideal model wherein school and society function as a unified whole and highlights the significance of a school to function as a social organization.



Figure 5: School, education and society as a unified whole (Dewey, 1915)

He (1915) adds, that the word organization itself means an efficiently and orderly structured body

of people with a particular purpose or goal. Every school must consist of five mandatory sections (shops, workshops, dining room, kitchen and library). Their individual roles and the significances of their inter-connectivity within the school system are vital.

He (1915) draws symbolic light on 'how and why' the symbiosis of school and society, through/by education, can lead to a progressive and holistic development as a unified whole and emphasizes on integrating 'psychology of occupation' within a school curriculum. He (1915) clarifies that here occupation does not mean work or profession, but it is an activity carried by a child, which represents or corresponds to some form of work in practical life. The psychology of occupation encourages students to comprehend and correlate their acquired intellectual, theoretical knowledge with practical experiences (Dewey, 1915) and thus engage in reflective thinking (Dewey, 1933).

Learning and development are conjunctive to education. Tudge, Putnam & Valsiner (1996) suggest that learning (in education) is a bidirectional, dynamic and a contextual process. The sociocultural context nurtures, influences and shapes an individual's thoughts, beliefs, actions, knowledge and skills. An individual, as a conscious active member constructs symbolic meanings from and with the other members (Scrimsher & Tudge, 2003).

The roles and significance of education can be studied at two levels: microscopic (within classrooms) and macroscopic (with a social context).

Education at the microscopic level occurs within classrooms. Here, the primary role of education is to facilitate meaningful, reciprocal interactions among students and the educator (Scrimsher & Tudge, 2003). Here, the bidirectional role of education has its roots in the Russian word *obuchenie*, connoting both, teaching and learning (Bodrova & Leong, 1996; Van der Veer & Valsiner, 1991). Most educators misinterpret their roles in teaching as to scaffolding or merely providing appropriate learning support, assistance, or guidance to the child (Scrimsher & Tudge, 2003). Vygotsky (1978, pp.90) states "Students learn from both, their teachers and more capable peers primarily, through social interactions and language. This is referred to as Zone of Proximal Development, ZPD". Simultaneously, teachers too learn, from their students (Scrimsher & Tudge, 2003). Every educator must balance this teaching/learning relationship between oneself and the students so as to facilitate dynamic, reciprocal, collaborative and symbiotic (mutually beneficial) experiences of education.

In Figure 6, Dewey (1916) draws light on prominent roles of education and their significances (at a

macroscopic level) in nurturing individuals, and hence societies:

ROLES AND	SIGNIFICANCE OF EDUCATION
As a necessity of social life	A self-renewal process in context to social continuity for humans.
For social control	Without education, there is always a fear of regression or barbarism.
As a Directive	It nurtures, influences and moulds the new, immature individuals' thoughts, beliefs and actions with symbolic meanings. Educators provide vital stimuli (as simultaneous, successive guidance) for adequate control and desired responses from students. It facilitates progressive growth and holistic development of the society.
As a Formal Discipline	It facilitates mandatory, convenient transmission/communication of acquired knowledge, skills, and experiences to the new, immature members of a society. Furthermore, education provides job opportunities for professionals in the fields of academics & research.
As Unfolding Process	It helps students to realize /utilize their latent powers in order to achieve their intended goals.
Provides a special environment	The process of education has a purified medium of action. It filters out all irrelevant things that exist in reality from learning environment in order to help students understand, adapt and learn growing complexities of a society in a simplified, and progressive manner.
As a Preparation for life	It helps individuals to acquire skills and knowledge for pursuing professions having social value (social efficiency) and symbolic meanings. It nurtures good civic efficiency - citizenship, morals, values and discipline.

Figure 6: Roles and significance of education (Dewey, 1916)

2.2 Learner-centred education: A paradigm shift

The word *paradigm* signifies a frame of reference that describes our perception and interpretation associated with the given education process (Johnson, Johnson, Smith; 1991). There are two main paradigms in education: teacher centred and learner-centred.

Teacher centred education (formal) has a systematic and organized approach with a rigid curriculum and clearly defined scholastic methodologies, content and objectives (Dib, 1987). In contrast, learner-centred education (often regarded as non-formal) is relatively more flexible and contingent to the child' individualistic capabilities/needs and steers on students' motivation to learn and active participation (Ibid). It is a highly challenging and time-consuming task for instructors, as it demands more time, effort and patience, especially during assessments. The Figure 7 provides a detailed comparison between the two paradigms (McManus, 2001; Garvin, 1991; Johnson et al., 1991; Meyers & Jones, 1993; Barr & Tagg, 1995; Smith & Waller, 1997a):

TEACHER-CENTRED (FORMAL)	LEARNER-CENTRED (NON-FORMAL)	
Ass	sumptions	
Learning content is primary and sufficient. Students enter a class with empty minds. Classroom is a private space.	Learning process (how) and learning content (what), both are equally important. Students enter a class with some perceptual framework. Classroom is a public space for review, assistance & research.	
Educo	ational Goals	
Teacher (expert) owns and directs the content through the transmission of factual knowledge without practical application/ experience.	Learning is dynamic and collaborative. It involves testing and restructuring of prior knowledge into new knowledge through practical means and enquiry, under the teacher's guidance.	
Teaching methods a	nd classroom environment	
Unidirectional lecturing wherein the content is matched to the curriculum goals. Classroom environment is competitive. Successis an individualistic accomplishment.	Matching of content and students' skills to the curriculum goals. Collaborative and supportive teaching-learning environment. Success results from teamwork.	
Instructor's responsibilities		
Instructors plan and deliver clear, linear lectures and presentations based on updated learning content. Instructors control the classroom.	Instructors set learning goals in order to set up an effective, collaborative teaching, learning environment. Teachers guide their students' learning direction and pace.	
Students	' responsibilities	
Record and absorb knowledge. Recall the learning content on tests. Students discuss their difficulties and leoutcomes. They learn to accommodate assimilate the acquired knowledge and skinnew situations.		
Instructor-students relationship		
Little interaction Impersonal	Instructors adopt diverse pedagogy based on students' needs, interests, and abilities.	
Motivating and mentoring students		
Extrinsic motivation such as high grades and rewards. Teacher mentors enhancement of learning content.	Teachers help students to set personal goals, monitor their progress, and align students' learning styles with interests to foster motivation and enjoyment.	
Students' goals		
Higher academic scores	Develop knowledge, skills for lifelong learning	
Tests and Assessment of Results		

Figure 7: Paradigms of education (McManus, 2001; Garvin, 1991; Johnson et al., 1991; Meyers & Jones, 1993; Barr & Tagg, 1995; Smith & Waller, 1997a)

Some researchers add a third paradigm to education – informal education, which an individual pursues it out of enthusiasm, interest, or intrinsic motivation and largely involves his/her voluntarily participation and does not have any scholastic obligations (Dib, 1987). Informal education, to a large extent, includes (but not limited to) the following activities: (a) visits to museums, fairs and exhibitions; (b) listening to radio or watching educational TV programs; (c) reading scientific, educational journals and magazines; (d) participating in scientific, academic contests; (e) attending lectures/conferences (Dib, 1987; pp. 305).

2.3 Learning as a holistic child development

The word *learning* originates from Middle English *lernen*, from Old English *leornian*, similar to Old High German *lernen* to learn.

The online Merriam-Webster (2012) dictionary defines *learning* as:

1) Modification of behavioural tendency through experience.

2) To acquire or gain knowledge of or skill by study, experience, or by being taught

3) Commit to memory

Säljö (1979) defines learning into five categories: 1) Learning as a quantitative increase in knowledge. 2) Learning as memorizing. 3) Learning as acquiring facts and or skills that can be retained and used as when necessary. 4) Learning as making sense or abstracting meaning. It involves relating parts of a subject matter to each other and to real life. 5) Learning as interpreting and understanding reality in a different way, i.e., Comprehending the world by reinterpreting knowledge. Ramsden (1992; pp.27) states,

These five categories in learning are sequentially hierarchical. When closely examined, the first two levels largely involve what Gilbert Ryle (1949) has termed as 'knowing that'; and from the third level onwards, 'knowing that' eventually transforms into 'knowing how'.

Often, learning is closely associated with intelligence. The word *intelligence* originates from late Middle English: via Old French from Latin *intelligentia*, from *intelligere*, meaning 'to understand' or 'the ability to acquire or apply accumulated knowledge or skills in given and or diverse, new situations' Merriam Webster Online dictionary, 2012).

Howard Gardener (1983) defines,

Intelligence as an inherent potential for solving problems, either by applying acquired knowledge and skills or by gathering new knowledge and skills. Every individual is born with varied configurations of seven multiple intelligences (as stated in Figure 8). Instructors must use diverse pedagogical methodologies to nurture all seven intelligences rather than focusing on a specific intelligence, to ensure a broader understanding and experience of 'education' for students.

INTELLIGENCES	DESCRIPTION	EXAMPLES
1. Logical	Ability to think, reason, manipulate numbers, quantities and operations	Scientists, Engineers, Chemists, Finance
2. Linguistic	Mastery of oral, written language in expression, memory	Writers, Journalists, Lawyers, Politicians
3. Musical	To hear, recognize and manipulate patterns and rhythms	Singers, Lyricists,
4. Spatial	Ability to visualize spatial patterns and relationships	Sailors, Architects, Pilots, Sculptors
5. Kinesthetic	Ability to understand & use the whole body/ body parts	Dancers, Athletes, Surgeons
6. Inter-Personal	Ability to understand other people: needs and behaviour.	Marketing, Educators, Social-workers
7. Intra-Personal	Ability of understand one-self and use it for self-management	Entrepreneurs, Artists, Psychologists

Figure 8: Multiple intelligences (Gardener; 1983)

French (2007) observed that learning and development are inextricably intertwined within a social context. Development is a product of a series of changes in biological, cognitive and socioemotional processes that occur throughout a human life span (Santrock et al, 2010). Biological processes involve changes in genetics and hormonal structures, maturation and in the functioning of motor skills. Cognitive processes involve changes in thinking, perception, memory, intelligence, and language. Socio-emotional processes involve changes in emotional competence, attachment, family relationships, peer relationships, socio-behaviour and personality. The Appendix A provides a detailed study on understanding holistic child development and psychology.

In Figure 9, Merriam and Caffarella (1991; pp.138) provide a detailed comparison on the four paradigms of learning: Behaviourist; Cognivist; Humanist and Socialist; each having distinctive purposes and roles in education.

BEHAVIOURIST	COGNIVIST	HUMANIST	SOCIALIST
Notable Theorists			
Thorndike, Pavlov, Watson, Hull, Tolman, Skinner	Koffka, Kohler, Lewin, Piaget, Bruner, Gagne	Maslow, Rogers	Bandura, Lave and Wenger, Salomon, Vygotsky
View of the learning process			
Change in behaviour	As an internal mental process	A personal act to fulfill potential	Through interactions and observations
Locus of learning			
Response (R) to external stimuli (S)	Internal cognitive structuring	Affective and cognitive needs	Relationship between people and their environment
Purpose in education			
Produce a desired change in behaviour	Develop capacity or skills to learn better	Become self- actualized and autonomous	Facilitate full social participation and utilization of resources
Educator's Role			
To arrange an environment to elicit desired responses	To structure the learning content of an activity	To facilitate development of a whole person	To facilitate frequent conversations and active participation
Manifestations in Learning			
Competency, training, skill development	Memory as a function of age, Intelligence, Cognition, Learning how to learn	Andragogy or Self-directed learning	Socialization Conversation Associationalism Social participation

Figure 9: Four paradigms in learning (Merriam & Caffarella; 1991, pp.138)
2.4 Play as learning

Play is central to humans and higher animals. Through play, kids try to understand, learn, impart symbolic meanings to and explore things they interact with (Rubin, Fein, Vandenburg; 1983).

Huizinga (1938, pp. 7-8) describes the core characteristics of pure play as -

Play is superfluous. It is a free; voluntary; meaningful and pleasurable activity for its player(s). It is not a work, which is linked to material gain, duty or obligation. Play is carried out in certain limits of time (duration) and space (location). This make-believe, temporal world is called the magic circle and it is distinct and secluded from real, ordinary life. Within the magic circle, all individuals exist as players and must abide by its rules. Outside this world, the individual is the real self. Rules define and structure play. Play creates order. This order filters out all unnecessary things that exist in reality in order to make play an engaging experience for its players. Play is tense, as it can involve uncertainty, competition, and ambiguity. Play also promotes the formation of phratia or social groups (play community).

2.4.1 Significance of play on learning & development

Research studies in biology, psychology and sociology have drawn light on the significance and impact of play on growth and human development. Play unifies the mind, body and spirit (Levy, 1978). Play prepares an individual for life (Groos, 1901; Plato, 1960; Steiner, 2001). Every individual's later life has roots in childhood-play (Froebel, 1887).

For a child, play is a mediator between the self and society (Dewey, 1916) as it bridges imagination and reality (Vygotsky, 1978) through creativity, fantasy (Steiner, 1998; Sutton-Smith, 1971; Bruner, 1983) and abstract thinking (Vygotsky, 1978). Play maintains an optimal state of arousal through various forms of stimulation (Berlyne, 1967).

During play, a child consciously or unconsciously, elaborates the complexity and scope of an activity according to his/her capacities (Rubin, Fein, Vandenburg; 1983). This is achieved through two vital processes: assimilation and accommodation (Bruner, 1983; Piaget, 1967). Assimilation means taking new materials from the outside world and fitting it into an individual's existing learning structures;

whereas, accommodation involves the adjustment of one's learning structure in reaction to the newly incorporated materials and situations (Bruner, 1983; Piaget, 1967). The processes of assimilation and accommodation involve situated learning as it occurs just above an individual's current level of competence and creates a Zone of Proximal Development (ZPD) (Vygotsky, 1978). Piaget (1967) believed that the principal motive responsible for cognitive development lies in us adapting to new circumstances through assimilation and accommodation in order to seek equilibrium, i.e., A state of restoring harmony between the world and self's perspective of the world. Hence, as adults, we must encourage and support the child's enthusiasm and emerging, constructive ideas during play (Singer, 1973).

Some researchers associate play with intelligence. Howard Gardener's multiple intelligences are based on preconceived notion of defining intelligence as 'having the ability'. James Findley (2008) argues, "Play is not a form of intelligence, but intelligence in all its forms! Children naturally learn and develop this ability (of play), simply because play is all about how to learn and not just what to learn. Play is the meta-intelligence."

Play is the highest level of child development (Froebel, 1887) and it is a base for learning and education (Hall, 1912). Play nurtures language (Vygotsky, 1933) and facilitates social development (Froebel, 1887; Piaget, 1962; Bruner, 1983).

Play as psychoanalytic (S. Freud, 1922; Erikson, 1974) reduces objective anxiety (fear of external world) by giving child power & control; reduces instinctual anxiety (human ego) by enhancing a child's self-esteem. Play facilitates emotional development by nurturing the immediate and unsatisfied desires (Vygotsky, 1933) of the player through opportunities wherein he/she can to express self-emotions (Singer, 1994) and inner self (Froebel, 1887).

2.4.2 Forms of play

Piaget (1951, 1962), Smilansky (1968), Pellergrini (1982), Smilansky and Sheftaya (1990) define play as a function of age and cognitive development and highlight the three forms of play (in Figure 10):

	Ages 0-2	Ages 2-7	Ages 7+
Jean Piaget (1951,1962)	PRACTICE Play MERE PRACTICE	SYMBOLIC Play	Play with Rules (GAMES)
	FORTUITOUS COMBINATIONS INTENTIONAL COMBINATIONS	Play Story-telling Imaginative	
Smilansky (1968)	Functional Play	Constructive Dramatic	Play with Rules (GAMES)

Figure 10: Forms of play (Piaget, 1951/62; Smilansky, 1968)

Practice or functional play is concentrated during the ages 0-2. It largely involves early reflexes and random movements. As they gain more control over their muscles, they tend to elaborate these early reflexes and random movements into voluntary actions. These physical or muscles movements help build strength, endurance, and skill (Smith & Pellegrini, 1993). They explore their world through these sensory impressions, motor activities and the coordination between the two.

Symbolic play or constructive dramatic play occurs during the ages 2-7. It is predominant among preschoolers and early primary kids. Symbolic play can be studied as object play, pretend play and socio-dramatic play. Object play refers to the playful use of any object through substitution. E.g. A pencil case becomes a phone to call up dad from work. During pretend play, children imagine an object or an action as something else. E.g. A boy playing with multiple toy cars imagines two racing teams, fighting for a win against each other. He pretends to be a different person (losing racer, commentator or winner) during play.

Socio-dramatic play exaggerates pretend play into more complex role-play and involves intricate story telling (Smith & Pellegrini; 1993). E.g.: A child role-playing as a doctor imitates his behaviour and use of language based on his/her real-life experiences at a clinic or hospital. During symbolic play, children oscillate between exploration and exploratory play (Garvey, 1977).

Goldstein, (1994) states

Through exploration, children aim to know the properties of something, whereas during exploratory play, they try to manipulate an object based on their understanding of its properties. Children play with toys and all sorts of tools. A toy is a representation of reality through its scale (miniaturization or gigantism), material, form or caricature, which immediately pronounces itself ready for a reaction of fantasy. In contrast, tools are devices for clear-cut, intended practical use. During play, they often manipulate toys as tools and tools as toys. E.g. A child dips a (toy) truck in paint to use it as a tool to make tire patterns on a paper. Or a child imagines a shoe (tool) as a mountain (obstacle) while playing with cars.

Play with rules or game is a rule-based, goal-oriented and problem solving activity, approached with a playful attitude (Schell, 2008). Games are transmedial (Juul, 2003). Play with rules or games will be discussed in detail in section 2.6 "Teaching/learning through didactic games".

According to Caillois (1961), there are four distinct types of play: 1) Agon, or competition, e.g. Chess. 2) Alea, or chance. e.g. A slot machine. 3) Mimicry, or role-playing. e.g. Playing with a doctor's educational set. 4) Ilinx, or vertigo, in the sense of altering perception. e.g. Riding in a roller coaster.

Play and games often combine these in varied configurations. For instance, a game of Scrabble[®] involves both, agon and alea. The game of charades involves agon and mimicry.

However, Parten (1933) argues that play does not consist of types but forms, as one form tend to dilute into the other. He (1933) suggests that play has five practical forms (as shown in Figure 11):



Figure 11: Practical forms of play (Parten, 1932)

1) Solitary independent play: Two or more children are actively engaged in separate, independent

activities using separate toys for the same duration and in the same physical space. Each child concentrates on his/her own play, without interfering in each other's play.

2) Onlooker play: A child takes interest in other children at play but does not join in (talks with the players or watches them playing).

3) Parallel play: Given a given time and space, two or more children play beside each other and do similar things but do not actively engage with one another.

4) Associative play: Two or more children interact by exchanging materials, thoughts, or by following each other's lead, but have separate goals.

5) Cooperative play: Children join together (as teams) to compete against or achieve a common goal. They adopt roles and share responsibilities in order to coordinate activities.

2.5 Teach/Learn through didactic games

2.5.1 Defining "gameness"

Juul (2003) uses the term *gameness* to identify attributes that are necessary and sufficient for something to be called as a game. He (2003, pp.35) defines gameness as "A rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable."

In Figure 12(a), he (2003) describes gameness from three crucial aspects: 1) The game as a formal system. 2) The player and the game. 3) The game and the rest of the world.

	1)	2)	3)	Other
Rules				
Variable, quantifiable outcomes				
Valorization of outcomes				
Player effort				
Player attached to outcome				
Negotiable consequences				

Figure 12(a): Defining gameness (Juul, 2003)

The Figure 12(b) provides a consolidation of game definitions given by notable game researchers, game-designers and philosophers from three crucial aspects:

10 Aspects	1)	2)	3)	Other
RULES		1		
Fixed rules (Huizinga, 1950)				
Rules (Caillois, 1961; Suits, 1978; Kelley, 1988; Zimmerman & Salen, 2003)				
Procedure & Rules (Avedon & Sutton-Smith, 1981)				
Formal system (Crawford, 1981)				
OUTCOME				
Uncertain (Caillois, 1961)				
Disequilibria outcome (Avedon & Sutton-Smith, 1981)				
Changing Course (Kelley, 1988)				
Quantifiable outcome (Zimmerman & Salen, 2003)				
GOALS				
Bringing about a state of affairs (Suits, 1978)				
Opposition (Avedon & Sutton-Smith, 1981)				
Conflict or a contest (Crawford, 1981)				
Object to be obtained (Kelley, 1988)				
INTERACTION				
An intricate web of cause and effect (Crawford, 1981)				
GOALS, RULES, AND THE WORLD				
Artificial conflict (Zimmerman & Salen, 2003)				
SEPARATE				
Outside ordinary life (Huizinga, 1950)				
Separate and unproductive (Caillois, 1961)				
No material gain or interest (Huizinga, 1950)				
NOT WORK				
Free / voluntary (Caillois, 1961)				
Voluntary control systems (Avedon & Sutton-Smith, 1981)				
Recreation (Kelley, 1988)				
LESS EFFICIENT MEANS				
Less efficient means (Suits, 1978)				
SOCIAL GROUPINGS				
Promotes social groupings (Huizinga, 1950)				
FICTION				
Representational/ Sub-set of reality / Safety (Crawford, 1981)				
Make-believe (Caillois, 1961)				

Figure 12(b): An amalgamation of game-definitions (Juul, 2003)

Juul's gameness definition highlights that games are transmedial, i.e. They can be transported to various medias - digital, simulated, tangible board games, card games, pen & paper, TV game shows, quiz games, sports, etc., Each having its own strengths and limitations.

Clear, defined fixed rules avoid ambiguity, conflict or confusion among the players. Players put effort in order to interact with and or influence the game-state or game-outcome, in pursue of the intended goal. Variable, quantifiable outcomes suggest that each outcome is substituted with a different value, each corresponding to either a positive or negative impact in the game. This creates contest in games. Players often get attached to the outcome, as it influences their actions, strategies or behaviour. The consequences of a game are negotiable and contextual; depending upon when, where, in what spirit and for what reasons is the game being played. E.g. The impact of losing a world-cup football match is much more severe than losing a game of backyard football.

Bernard Suits (1978) states,

Every game has four main elements: 1) the goal, 2) the constitutive rules, 3) the lusory means and 4) lusory attitude (game attitude). In a game, rules and the ends are inseparable. Players can only play and win the game, if they obey the constitutive rules. These rules permit the use of 'lusory means' (which are less efficient and narrower in scope, in context to reality), in order to achieve an intended goal. The experience of the end (as winning or losing) in a game is the based on what rules have been applied to restrict what means in order to attain a certain goal.

Playing games and working are two distinct activities. Work is considered a technical activity wherein an individual wants to achieve the intended goal, using the most efficient means, and in the most efficient manner, whereas during a game, players intentionally adopt lusory means (relatively inefficient means) in order to reach the desired goal.

Schell (2008) states that every game consists of an elemental tetrad: aesthetics, mechanics, story and technology (as shown in Figure 13).



Figure 13: Elemental tetrad of a game (Schell, 2008)

This two-dimensional tetrad does not give relative importance of any one element, rather, it illustrates the 'visibility gradient' that a player perceives while playing a game and has a powerful impact in facilitating effective, learning experiences of the player (Schell, 2008).

2.5.2 Didactic Games

The word didactic originates from the mid. 17th century Greek *"didaktikos"*, from *"didaskein"* meaning *"*to teach". The Merriam Webster online Dictionary (2012) defines the word *didactic* as: 1) Designed or intended to teach. 2) Intended to convey instruction and information as well as pleasure and entertainment.

The pedagogic dictionary (Prucha, Wallterova and Mares, 1998, pp.48) describes:

A didactic game is an activity for both pupils and a teacher pursuing certain didactic targets. Pupils usually do not consciously realize these didactic targets. It may take place within a classroom, playground or outdoors. It has its own rules, and requires constant supervision and final assessment. Students participate as individuals or in a group. The educator's role ranges from a main organizer, controller to an observer. Its priority is in its stimulating nature, as it stirs interest, increases student engagement and stimulates creativity, spontaneity, cooperation and competitiveness. Didactic games make students utilize diverse knowledge and abilities and engage their life experience.

Some didactic games simulate real-life situations.

Didactic games primarily consists of four main parts (Mojžíšek, 1975):

The game environment is a combination of users (pupils, teachers, teaching assistants, etc.) and material environment with necessary aids and equipment. It should motivate and encourage pupils to actively participate in order to attain intended learning targets.
Didactic game targets are the educational targets (based on curriculum objectives, educator's pedagogical styles) that pupils need to achieve from the game.

3) **The game procedure** itself is the performance of the didactic game. It needs to be age appropriate. The game procedure must maintain a balance between the pupils 'challenge level and skills in order to be interesting and engaging. The rules determine how to play and win the game. The game procedure must ensure that the pupils' efforts are directed to achieve intended game targets.

4) **The final game assessment** verifies and rewards pupils for achieving the learning target. This can be carried out as a part of the game itself or as a separate supplementary activity (e.g. worksheets).

2.5.3 History of Didactic Games in education

In ancient Greece and Rome, games were used as a means of education. Plato (427 BC - 347 BC) used jigsaw puzzles to teach children of ages 3-7. The fall of Western Roman Empire consequently, led to authoritarian rule of a feudal system during the 5th-15th century. During this era, greater influences of the medieval Church on education laid discipline and obedience as the foundations for drilling methodologies in learning. Games were rarely used in education.

The Renaissance marked the invention of printing and growth of commerce. Primary education was viewed as a vigorous training process and for practical applications such as to know how to read, write and calculate (Dewey, 1889). In the late 16th century, J. A. Comenius (1592-1670) laid foundation for "the school of play". In the 17th century, John Locke (1698), a notable contributor of the Empiricism movement, commenced "learning by doing' school of thought.

Zuckerman (2006) defines

'Learning by doing' primarily involves active, experiential learning through sensory interactions with tangible learning objects. Learning objects are simple and childaesthetic. They are often progressive, modular in design. They encourage social interactions with peers and adults within a controlled learning environment to facilitate intended learning goals. The educator provides adequate guidance and support as when required.

This later highly motivated and influenced prominent thinkers like Montessori (1870-1952), Froebel (1782-1852) and Dewey (1859-1952). Zuckerman (2006) classified learning objects based on the three prominent movements in education as mentioned in Figure 14:

INTELLIGENT HAND MOVEMENT	EXPERIMENTING MOVEMENT	SIMPLIFIED REALITY MOVEMENT
Maria Montessori (1949) created 'Montessori materials' that were designed for a prepared environment. She studied that children can independently 'absorb' abstract concepts from manipulations through physical interactions with learning materials. E.g.: Montessori's 'long stairs' are designed for children to 'absorb' the concept of number.	Friedrich Wilhelm August Froebel (1782-1852) coined 'kindergarten' or children's garden. He regarded education as a fostering activity, similar to the notion of nurturing plants. He believed that children could have a balanced growth and development with favorable conditions, environment and nutrients. E.g.: 'Froebel's gifts' are age appropriate materials to nurture self-motivation, free-play and discovery (Phillips, 1957).	John Dewey (1859-1952), similar to Vygotsky (1896-1934), emphasized on the formation of mind as a social process. A learning environment must engage children in social activities that are simplified versions of real-life scenarios and encouraged free role-play that facilitates experiential learning (Dewey, 1938). He did not design specific learning objects because he believed that all learning objects must fit to child's proportion or scale, and must be safe for use.
		REALITY ROLE-PLAY
	CONSTRUCTION & DESIGN	Baby Dolls
CONCEPTUAL MANIPULATION Shape Puzzles Alphabet Blocks Number Tiles	LEGO® Bricks, Lincoln Logs® Paper weaving Unit Blocks	Kitchen Sets Role-play Costumes Doctor sets

Figure 14: Classification of learning objects (Zuckerman, 2006)

2.5.4 Flow in games

Flow or optimal experience is a state wherein an individual's high abilities (skills) are harmoniously balanced and synchronized with appropriate level of challenges faced by him/her while performing

a task (Csikszentmihalyi, 1991). During flow, an individual is highly active; intrinsically motivated; deeply concentrated; in a sense of ecstasy (of being outside everyday reality); experiences timelessness; has strong self-control; great inner clarity and self-confidence of achieving the intended goal (Csikszentmihalyi, Schneider, & Shernoff, 2003). Flow and games share a natural connection (Csikszentmihalyi, Rathunde; 2005a, 2005b). Csikszentmihalyi (1996) found a positive correlation between flow and high performance in pedagogy and education.

The Figure 15 describes distinct psychological states associated with varied combinations of high/ low challenges and high/low skills (Csikszentmihalyi et al; 2003, 2005).



Figure 15: Psychological states & Flow (Csikszentmihalyi et al; 2003, 2005)

During an activity, when the challenge is high and skills are low, an individual experiences anxiety or stress. In contrast, if the challenge is low and skills are high, one is in a state of boredom. Furthermore, when challenges and skills both are low, apathy rather than engagement was reported, which contradicted the flow channel model. The midpoint on the graph defines the average skills and challenges needen for an activity. Thus, in order to facilitate flow-like learning experiences, games must ensure that the player remains within the domains of arousal and control. Personality traits associated with high levels of flow include optimism and self-esteem (Schmidt, Shernoff, & Csikszentmihalyi, 2007).

The study of flow has been pursued mainly through the use of the Experience Sampling Method or ESM (Hektner, Schmidt, & Csikszentmihalyi, 2007). Respondents carry a paging device (usually), which when signalled, they complete a brief questionnaire about details on day/time of the signal; activity performed at that particular time interval; and feedback on cognitive, affective and

motivational qualities of their experience (Ibid).

2.5.5 Motivation, learning, flow, and games

In Figure 16, Shernoff (2001); Shernoff et al (2003); Shernoff & Hoogstra (2001) provide an empirical model on how to facilitate long-term motivation and flow in classroom learning. They (2001, 2003) state that flow in classroom instructions can be studied from two converging aspects: academic intensity and positive emotional response.

Academic intensity is the synthesis of challenge and relevance and has a strong influence on student attention, concentration and interest. Its orientation lies towards extrinsic motivation and short-term performance in students. For instance, often students are rewarded when they attain high scores in dictations, tests or quizzes. However, these experiences report high student concentration and low active participation due to lack of interest and enjoyment.

Positive emotional response is closely associated with high skills, activity level and control. This leads to student enjoyment, high self-esteem and nurtures long-term performance and intrinsic motivation in children. For instance, most students enjoy watching art/craft shows or backyard science projects on television and playing games. But these experiences report low academic intensity.



Figure 16: Empirical model of Flow. (Shernoff, 2001; Shernoff et al, 2003; Shernoff & Hoogstra, 2001) Hence, optimal learning environments must integrate activities that are challenging and relevant, and simultaneously allow students to enjoy, concentrate, be confident and in control. This will intrinsically satisfy and nurture their cognition, emotions, skills and interest for the long term.

2.6 Summary

During classroom instruction, most educators face the challenge to balance academic intensity (challenge and relevance) with positive emotional response (skill, control and activity level) for their diverse learners (Csikszentmihalyi, Schneider, 2000; Rathunde, 1993). Didactic games can be used as an effective, collaborative, pedagogical tool to resolve this imbalance, due to their potential of being immersive, goal-oriented; enjoyable; and provide recurrent opportunities for reflection (Oblinger, 2006); skill development (de Freitas, 2006). They can successfully conceal a significant amount of learning content within them (Houser & Deloach, 1998). Paras & Bizzocchi's (2005) state "Games foster play, which produces a state of flow, which increases motivation and supports the learning process".

However, Oblinger (2006) argues that just adding games to a curriculum does not ensure effective, engaging, learning experiences. In fact, most educational games fail to unify game-play elements with the contextual content (De Castell & Jenson, 2003). Games as an educational toolset, need to be integrated into and synchronized with the subject content; game properties; teacher's instructional style; students' learning abilities; intended learning outcomes; and the curriculum, as a unified whole (Oblinger, 2006). Classrooms can then emerge as more dialogic, symbiotic and dynamic social environments, facilitating holistic development of both, the students and the teachers.

Game must unify play and education seamlessly, to ensure that the magic circle is concealed, players are immersed and intended learning outcomes are facilitated (De Castell & Jenson, 2003). Educators should focus on age-appropriate classroom instruction, i.e., Neither too difficult/stressful, nor too easy/boring for their learners (Santrock et al, 2010). To ensure this, instructors must take limitations of working memory and diverse learners' capabilities into consideration while planning and structuring the amount of information (content) per lesson. Also, encoding and retrieval strategies from information processing theory, can act as a toolkit for facilitating the transfer of new knowledge into the long-term memory.

Chapter 3: Research Methodology

This chapter highlights the purposes and goals of using Mixed method research (as sequential exploratory design) for data collection, interpretation and analysis during this research study.

The first phase will be a qualitative exploration of routine pedagogical activities and users' behavioural patterns within P.4 and P.5 ELS classrooms. Qualitative data will be collected through participant observations and individual interviews from P.4-P.5 ELS teachers and students at Sham Tseng Catholic Primary School (STCPS), Hong Kong. This will help in identifying the key factors for designing didactic games for classroom environments.

The second phase (quantitative phase), will follow up on the qualitative phase. The objective is to develop four instruments (didactic games) that can test and collect feedback on the impact on students' motivation, learning and performance through didactic games. Game-based experiments, performance-worksheets and individual questionnaires are used as vital tools for analysing and testing the instrument.

In this research, qualitative data is collected first, as there is need to develop an instrument based on qualitative, contextual requirements. These four instruments are evaluated based on the quantitative data gathered from participant users. Towards the end, this sequential exploratory (instrument development) mixed methods design aims to narrate an empirical framework on how to effectively design, and use didactic games in Primary classrooms. Multiple ways are visible in everyday life, and mixed methods are natural and practical for research Creswell & Plano Clark, 2010, p.2).

3.1 Mixed methods research

Mixed methods research deals with both, qualitative data (involving descriptions such as visuals, words, attributes) and quantitative data (that measure using numbers).

Creswell & Plano Clark (2010, p.5) define,

Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis and the mixture of qualitative and quantitative approaches in many phases of the research process. As a method, it focuses on collecting, analysing, and mixing both, quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone.

Recent studies describe mixed methods as the "third methodological movement subsequent to quantitative and qualitative research" (Tashakkori & Teddlie, 2009) and the "third research paradigm" (Johnson & Onwuegbuzie, 2004, p.15).

The design of mixed methods research can be either fixed or emergent (Creswell & Plano Clark, 2010). In fixed mixed methods design, the researcher implements QL and QN procedures/methodologies based on a predetermined plan. Emergent mixed methods design occurs when the researcher realizes that adopting singular method is inadequate and there is a strong need for an alternative approach (QN or QL) while conducting the research process (Morse & Niehaus, 2009).

The Figure 17 outlines a decision tree for mixed methods design (Creswell, Hanson et al, 2003; Plano Clark, 2005). The choice of research design is based primarily on three-core decisions:



Figure 17: Decision tree for mixed methods design (Creswell, Plano Clark, et al 2003; Hanson et al, 2003; Plano Clark, 2005)

a) The timing decision: Timing prescribes the order in which researchers use (collect, analyse, interpret) data (Morgan, 1998). Timing within mixed methods design is classified in two ways: concurrent or sequential (Morse, 1991). Concurrent timing signifies simultaneous (or approximately at the same time) usage of both, QL and QN data. Sequential timing denotes that the researcher gives priority to use either one of the two (QL or QN) first, and then subsequently uses the other.

(b) The relative weightage given to QN and QL approaches: Weightage signifies the relative "priority decision" given to QN and QL methods in order to justify and answer

the research question (Morgan, 1998). This relative weightage can either be equal (QL=QN) or unequal (QL>QN or QL<QN).

(c) The approach towards mixing/connecting of the two data sets: The third procedural consideration is how QL and QN methods are to be mixed. Conceptually, there are three strategies for mixing QL and QN data sets: merging data, embedding data and connecting data.

Based on the decisions mentioned above, Creswell, Plano Clark et al (2003) categorize mixed method research design into four types (Figure 18):

DESIGN TYPE	VARIANTS	TIMING	WEIGHTING	MIXING	NOTATION
Triangulation	Convergence Data transformation Validating QN data Multilevel, developing large scale evaluation projects	Concurrent	Usually equal	Merge data during the interpretation or analysis	QUAN+QUAL
Embedded	Embedded Experiments and Correlational design, mixed methods Narrative research and ethnography	Concurrent or Sequential	Unequal	Embed one type of data within a larger design using the other data type of data	QUAN (qual) or QUAL (quan)
Explanatory	Develop explanations Participant selection	Sequential	Usually Quantitative	Connect the data between the two phases	QUAN -> qual
Exploratory	Develop Instrument Develop taxonomy	Sequential	Usually Qualitative	Connect the data between the two phases	QUAL -> quan

Figure 18: Four categories of mixed methods research design (Creswell, Plano Clark et al, 2003)

3.2 Reasons to employ Mixed methods

For the purposes of this research, merely adopting either QN or QL approaches as methodology source for using data can be insufficient, limited and inconclusive. I adopted mixed methods

research as it would yield a more comprehensive evidence and thus, enhance the credibility and completeness of this study. It provided me with the freedom and flexibility to select multiple, alternative methodologies to gather, analyse and mix (QL and QN) data for acquiring a holistic understanding about the research problem.

However, mixed method research is relatively more demanding (competent skills and efforts), time consuming and expensive (resources). In instances when diverse methods yield different results, the researcher faces the challenge to responsibly process (find connections between) this diverse data and transform it into comprehensive, valuable knowledge.

In Figure 19, Bryman (2006) identifies the various reason(s) for using mixed method approach:

Triangulation: QN & QL research can be combined to triangulate findings for mutual corroboration.

Offset: Neutralize weaknesses of singular QN or QL research, by combining both to extract their collective strength.

Completeness: More comprehensive approach of inquiry when QL+QN are employed. **Process:** QN research provides an account of structures in social life but QL provides sense of process.

Different research questions: Each method can answer different research questions. **Explanation:** One method is used to help explain findings generated by the other.

Unexpected results: Merging of QL and QN methods when one method is employed to understand the surprising results generated by the other.

Instrument development: QL research is employed to develop questionnaire and scale (QN) tools.

Sampling: One approach is used to facilitate the sampling of respondents or cases. **Credibility:** By employing both approaches, integrity of the findings is enhanced.

Context: Rationalization of findings through combining of contextual understanding (QL) with general externally valid findings (QN).

Illustration: QL data is used to illustrate QN findings.

Utility or improving the usefulness of findings: Highlighting the prominence and usefulness of findings by combing QL and QN approaches.

Confirm & discover: Using QL data to generate a hypothesis and QN research to test it. **Diversity of views:** Combining researchers' and participants' perspectives through mixed research; uncovering relationships between variables through QN research while also revealing meanings among research participants through QL research.

Enhancement: To augment either QN or QL findings by gathering data using either research approach.

Figure 19: Reasons for employing mixing methods (Bryman, 2006)

3.3 Research Design

3.3.1 Sequential exploratory mixed methodological framework

This research study is based on *sequential exploratory mixed methods research design with an emphasis on the instrument development model.* It consists of two distinct phases: qualitative (QL) followed by quantitative (QN) (Greene et al, 1989; Crewell, Plano Clark et al, 2003). The researcher first explores existing phenomenon through the collection and analysis of qualitative data. These QL findings act as a guiding tool for developing the components and scales for the instrument. The researcher then, implements and evaluates the credibility of this instrument quantitatively within that context. In this design, QL and QN methods are connected through the development of proposed instrument. This design often emphasizes on the quantitative aspect of the study (QUAL -> quan). This *sequential exploratory mixed methods research design* is primarily rooted on the premise that an exploration is needed for several key reasons (Creswell, 1999; Creswell et al, 2004): 1) Measures and instruments are unavailable. 2) The variables are unknown. 3) There is no guiding framework.

My research focuses on how to foster motivation, enjoyment, and learning performance through didactic games within P.4 and P.5 ELS classrooms in Hong Kong. The qualitative strand enables me to explore and understand the detailed nuances (such as classroom structure; diverse pedagogy; students' learning behaviours; teaching/learning difficulties; and challenges) within this context. Generous qualitative data is collected through interactions with students and ELS teachers within Hong Kong P.4 and P.5 ELS classrooms.

The intent of this research is to design, implement, test, and develop four instruments (or didactic games) for P.4 and P.5 ELS classrooms in Hong Kong. This statistical data evaluates and validates the credibility of QL results obtained in the first phase. These proposed instruments are tested through collection and analysis of QN data. They help to identify the crucial variables needed for instrument (didactic games) building (design) for classroom use.

In Figure 20, Creswell (2004) clearly provides the flow chart for basic procedures for implementing sequential exploratory (instrument development) mixed methodological framework with further context to the main study in this research.



Figure 20: Flow chart of basic procedures for implementing sequential exploratory (instrument development) mixing methodological framework (Creswell et al, 2004)

3.3.2 Strengths and challenges in using exploratory design

Creswell, Plano Clark et al (2003) have identified the strengths and challenges of using sequential exploratory design. Distinct QL & QN phases make research design easier to define, implement and interpret. Gathered QL findings gain greater credibility when they are evaluated using QN aspects. The developed new instrument acts as one of the potential products of the research process. However, this two-phase approach requires considerable time to implement and to develop a new instrument. Using a small purposeful sample in the first phase, and a large sample of different participants in the second phase can be used to avoid bias-ness. The researcher faces a conflict/ responsibility to wisely select appropriate QL data in order to build a QN instrument. He/she has to ensure that the scores/measures developed through that instrument are valid and reliable.

3.3.3 Pilot study

As an expat researcher, it was crucial for me to get a realistic experience and deeper understanding about the Hong Kong education system and Primary school environment. Several local schools were approached for conducting field studies. However, only Sham Tseng Catholic Primary School (STCPS) provided authoritative permissions to conduct field studies for one academic year (2012-13). Established in 2009, STCPS is an aided; whole day (8:10 a.m.-3:10 p.m.); coeducational; symmetric; local; aided Primary school located at 37 Castle Peak Road, Sham Tseng, Tsuen Wan, New Territories, Hong Kong. The medium of instruction (MOI) is Chinese. There are 24 classrooms (4 for each level from P.1-P.6) with a total student population of approx. 720.

A pilot study was conducted for three consecutive months (3rd October-19th December 2012) for 88 sessions within one English lab (common for all twelve P.1-P.3 classrooms) and P.5 (section D) ELS classroom. Each session (lesson) is 35 -40 minutes in duration. The schedule for routine field observations was based on the school timetable.

Initial QL data was collected through field observations and semi-structured interviews, followed by a game experiment. Documentation was done using immediate transcription; audio taperecording and photographic snapshots techniques respectively. This enabled me to understand the pedagogical processes and challenges involved in routine classroom instruction. My focus was to have first-hand interactions with local Primary students; mapping routine lesson patterns; comprehending diverse pedagogical styles, techniques; and observing overt student behaviour. This experience indicated few valuable insights. Initially, most ELS teachers were sceptical and uncomfortable in interacting with an outsider within their environment. Thus, access for initial study was limited to only (P.1-P.3 and P.5) classrooms. Similarly, students were shy and hesitant to interact with a new, expat person. However, gradually, interactions and communications came easy and naturally.

Setting up a video camera during classroom instruction seemed to intrude the natural environment. It affected the educator's comfort level and behaviour. Students became conscious and alert with the thought of being video recorded. To avoid disturbance within the naturalistic setting and behavioural patterns, video recording was thus abandoned. Hand-written field-notes was used as an alternative tool for documentation. After developing a rapport and good comfort level with the teachers and students, permission was given to take photographs at regular intervals during the study.

Towards the end of school term, an initial game experiment was conducted among 103 P.5 students and 4 ELS teachers. The game experiment was based on Chapter 3 from the course textbook (Primary 5A Longman Elect). This initial slice of research was undertaken to gather feedback on the teachers-students' intention, motivation and scope for integration and development of didactic games within P.5 ELS classrooms. This preliminary study process will be elaborately discussed further in Chapter 4. The implications from the pilot study were adopted in the main study.

3.3.4 Main study

The pilot study helped in defining research scope and focus for the main study. All P.4 and P.5 classrooms were short listed for research. This deliberate selection of identified sample size was due to the following reasons:

1) Results from the pilot study show that the English language lab (for P.1-P.3 students) is relatively quite sophisticated and resourceful in playful and game-like activities.

2) While interacting with P.1-P.3 students (ages 6-8), I realized that it is quite time consuming and challenging to extract relevant information on subjective learning experiences and adequate reliable feedback from such a juvenile

target users.

3) Across P.1-P.3 classrooms, students are distributed evenly, irrespective of their academic performances. From P.4 to P.6, students are arranged based on their academic abilities in each section A, B, C, and D wherein A, B consist of the academically brighter students as compared to sections C and D. Mostly, section D consists of students with lowest academic performance, slow learners and students with special educational needs (SEN). Technically, from P.4 onwards, students gain first hand experiences of formal teaching/ learning scenario within a competitive and disciplined environment.

4) The main study period of my research, overlapped with the ongoing second academic term at primary school. In this duration, most P.6 students are quite preoccupied with interview preparations and tutorials for placements to secondary school.

Hence, I decided to focus on P.4 and P.5 ELS classrooms, due to their immediate and complete access within my predefined limitations of time, resources and research schedule. I wanted to familiarize myself with the intricacies and inter-relationships particularly, involved in ELS classroom instruction and styles; diverse learner behaviour patterns; and learning content within all five P.4 and four P.5 ELS classrooms. The main study span stretched for a duration of four months, from 11th March to 12th July 2013. In-depth field studies were conducted for 126 double sessions across 14 weeks. Each double session lasted for 70-80 minutes. The sample size comprised of 103 P.4 students and 105 P.5 students including nine ELS teachers and one ELTA.

I adopted four methodologies at different stages of this mixed methods research. The schedule for conducting QL research (field observations, semi-structured individual interviews); followed by QN research (field experiments, content analysis and questionnaire surveys) was synchronized with the school table and lesson plans.

1) Systematic field observations: Observations record first-hand information, witnessed by the eye. They are systematic; relevant; complete; precise; and obvious. They are often conducted within naturalistic conditions and setting. Based on the degree of interaction with the participants, observations can be classified as *distant observation* (observing user's natural behaviour from a distance) and *participant observation* (actively and voluntarily indulging as a participant in a given situation). They only record overt behaviour (observable and measurable), not intentions. It requires

strong commitment for consistency and hence is quite time-consuming. Issues with reliability (can be too subjective, can over-simplify /misinterpret a situation) can arise. A combination of distant and participant field observations were used to gain first-hand experiences of routine pedagogy, styles and user behaviours within P.4 and P.5 ELS classroom environment. The camera is used as a vital tool for capturing repeated snapshots. The credibility of these observational findings are tested by conducting individual and group interviews. These help in identifying the motives behind users' subjective behaviours and actions.

2) Individual semi-structured interviews with P.4 and P.5 teachers: Semi-structured individual interviews are conducted with P.4 and P.5 ELS teachers to gather rich, diverse in-depth information on subjective perception for their intended behaviour, and pedagogical actions. This methodology also helps in providing feedback on proposed didactic games based experiments. Interviews require equipment (audio recording) for documentation. They have a degree of flexibility, control and validity; high response rate (feedback, enthusiasm) and can be conducted in naturalistic or artificial setting. Interviewee can develop and elaborate ideas based on respondent's feedback. However, interviews can be time consuming and may have issues with reliability on consistency and objectivity. Group interviews were purposely avoided as they tend to create a leader-effect and in certain cases, create monopoly of senior teachers. In semi-structured interviews, I clearly listed the underlined issues that needed to be addressed and questions that required answers.

3) Experiments: Experiments are primarily conducted to study and measure 'cause and effect' (before and after) of an action in a particular situation. They are primarily used for descriptive / theoretical experimental studies and instrument building. They can be conducted in naturalistic or artificial setting. However, they tend to be expensive and time-consuming. Game based experiments were conducted within the naturalistic setting (Hong Kong P.4 and P.5 ELS classrooms) to test and evaluate the students' learning outcomes and motivation towards newly designed didactic games.

4) Questionnaire surveys: Questionnaires are used as a tool to gather data from large groups of people for structured interviews or surveys. They must have a neutral stand-point, clarity, legibility and ensure effectiveness. Their strengths are economical; convenient to implement; less time consuming; easier to arrange, analyse and quantify; flexibility in structure (open-ended or closed); and have a strong convincing rigor. However, they can also have a poor response rate due to being repetitive, lengthy and boring. Lack of information in incomplete questionnaires is an issue. In context to this research, questionnaire based surveys were used to gather feedback

and investigate details about subjective learning experiences from larger group of 208 (P.4 and P.5) students on game based experiments, across different locations at a given point of time. Simple, legible design strategies such as pictorials, more close-ended questions (involving simplified Likert-type scale), and few open-ended questions were used to avoid problems such as apathy, confusion, or tiredness. The QN data gathered from these student questionnaire based surveys was evaluated against individual work-sheets in order to find relevant connections/similarities between student's feedback on personal thoughts/experiences and corresponding student's performance results.

The entire main study process is elaborately discussed in Chapter 5.

3.4 Research Time line

The Figure 21 depicts research time line. Colour coding is used as a reference key for corresponding chapters mapped out in the thesis. This linkage helps to underline and correlate the research flow and the thesis.

Year of study	YEAR 1: 2011.08 to 2012.08	YEAR 2: 2012.08 to 2013.08	YEAR 3: 2013.08 to 2014.08
months	3 9 10 11 12 1 2 3 4 5 6 7 8	3 9 10 11 12 1 2 3 4 5 6 7 8	3 9 10 11 12 1 2 3 4 5 6 7 8
STAGE 1: Preparation	for confirmation (2011.08 to 2013.03)		
Narrowing research area			
Literature Review			
Pilot study			
Research methods			
Research Plan			
Confirmation		>	
STAGE 2: Main study - (Case study of Sham Tseng Catholic Prim:	iry School (P.4 and P.5) ELS classrooms	
Field observations			
Content analysis			
5 Experiments			
Semi-structured interviews			
Questionnaire surveys			
Initial variables			
STAGE 3: Data analysis (2013.09 to 2013.12)		
Analysis of data			
Findings & discussion			
Conclusion			
STAGE 4: Thesis writing	submission & oral examination (2014.0	l to 2014.08)	
Thesis writing			
Thesis revise			
Oral examination			
Final submission			
Additional requiremer	<pre>hts: Conference papers and Mandatory 1</pre>	5 credits (2011.08 to 2014.08)	
3 conference papers		5	5
SUBJECTS (15 credits)	6 credits 3 credits	6 credits	

Figure 21: Research time line

3.5 Summary

According to John Zeisel (1984), "Research can provide deeper insight into a topic, better understanding of a problem, more clearly defined opportunities or and constraints on possible action, measurement of regularities, and ordered descriptions". This chapter describes the various methodologies and tools, which were adopted for the purposes collection, interpretation and analysis during this sequential exploratory mixed methods design research study. For the purposes of designing and developing instruments (didactic games) for effective teaching/learning experiences, 'field-experiments' methodology forms the core of this study. Specific experiments are designed and conducted within the naturalistic setting of P.4 and P.5 ELS classrooms in order to test and evaluate their impact on learning. This empirical methodology of "learning by doing" provides immediate, authentic, practical feedback and helps in identifying the core factors for designing didactic games. Other methodologies that support and evaluate these findings include semi-structured individual teachers' interviews; questionnaire based student surveys and students' assessments through performance-based exercise tasks (worksheets).

Chapter 4: Hong Kong P.1-P.6 ELS classrooms

This chapter is based on a pilot study conducted at Sham Tseng Catholic Primary School, in New Territories, Hong Kong. It highlights the QL data on compare and contrast between P.1-P.3 and P.4-P.6 ELS classrooms. These QL findings are gathered through routine field observations and semi-structured (individual) interviews. Based on these QL findings, an initial game experiment is conducted among thirteen randomly selected P.5 students. This helps in identifying the limitations and scope for integrating didactic games within ELS lessons. Diverse users' (P.5 students and teachers) feedback is also documented and discussed in detail. The later section provides an overview of Hong Kong ELS curriculum. This is elaborated from various crucial aspects - goals and objectives, task-based, assessments, roles of teacher in ELS education, etc. This section helps in defining didactic game targets based on defined curriculum-based educational goals.

4.1 Hong Kong P.1-P.6 ELS classrooms

A pilot study was conducted (from 3rd October to 19th December 2012) for 88 sessions at Sham Tseng Catholic Primary School (STCPS, Figure 22) in Hong Kong.



Figure 22: STCPS, Hong Kong

The medium of instruction (MOI) is Chinese. Most students are residents of neighbouring areas (public and private housing estates). There are 24 classrooms (4 for each level from P.1-P.6) with a total student population of approx. 700. Students in P.1-P.3 are evenly distributed in each class. Students in P.4-P.6 are arranged according to their academic ability in the sections A, B, C, and D wherein A, B consist of the academically brighter students as compared to sections C and D. Mostly, section D consists of students with lowest academic performance and students with special educational needs (SEN). Two major assessments (one test and one exam) are conducted in each term of the academic year. They are preceded by several formative assessments like quizzes, dictations, homework, group activities, project work, playful activities, oral presentations, games, etc. STCPS has a total teaching staff of approximately 40 teachers. The school follows 'Primary Longman Elect' as the curriculum for

ELS education. The school-timetable design provides teachers with opportunities to plan double lessons as when required. Each lesson is for 30 minutes. The schedule for routine field observations was based on the school timetable.

4.1.1 P.1-P.3 ELS classrooms

English lessons in P.1 to P.3 are conducted in a specially designed environment called as English Language Lab (ELL). It is important to understand the spatial layout of ELL, as it forms the framework for planning and executing lessons. The Figure 23 provides a plan of spatial layout of ELL. Here, teaching and learning takes place in two scenarios: Pair-work and individual tasks in small groups, in the presence of a teacher and informal, collective teaching-learning sessions on the mat.

Scenario 2:



Figure 23: Spatial layout of English Language Lab

For each class, students are categorized into four groups: blue snakes, green frogs, yellow ducks and red hens based on their academic capabilities. The 'red-hens' and 'yellow ducks' comprise of students with high academic abilities. The 'blue snakes', consists of students with medium academic abilities.

From P.1 to P.3, students are distributed equally in all classrooms. Each class consists of students with diverse abilities, SEN to high. Students are assigned groups (based on their academic performance) within each classroom. Individual feedbacks from teachers highlight that predefined, colour coded, ability-based group formations within each classroom, enables them to monitor and exert individual attention to the specific needs of students. Standard group formations saves time, effort and ensures smooth functioning of routine pedagogical activities.

However, the 'green-frogs' comprises of students with specific learning difficulties or special educational needs (SEN). The NET exerts special attention and closely monitors their learning. Here, SEN students should not be confused with physically challenged and students with cognitive disabilities. According to the Hong Kong Education Bureau (2012), SEN students are advised to attend ordinary schools so that they can develop their full potential, achieve as much independence as they are capable of, and become well-adjusted individuals in the community. Students with more severe or multiple disabilities are placed to special schools for intensive support services.

SEN students predominantly possess specific learning difficulties in reading and writing (SPLD), also known as dyslexia. Despite their normal intellectual capacity and sufficient learning opportunities, SPLD students struggle in accurate and/or fluent reading, spelling and writing skills. The cognitive deficits underlying these reading and spelling difficulties are a weak working memory; slow speed of retrieval and deficits in orthographic knowledge (rules of spelling, hyphenation, capitalization, word breaks, emphasis, and punctuation); phonological awareness and decoding (sounds in language); visual auditory perception or sequencing skills (Grigorenko, 2001).

All lessons are conducted in the presence of three teachers - Native English Teacher (NET), Local English Teacher (LT) and an English Language Teaching Assistant (ELTA). IT is used as a supportive tool for sharing videos and discussing class work activities through structured power point presentations. The ELL is a dynamic and a rich environment and this is clearly reflected in the teaching/learning process. Teachers take special initiatives to exhibit the ongoing lesson learning content as pictorial information display boards and vocabulary word buntings that are hung from the ceiling. Prior to the commencement of each lesson, ELTA diligently prepares the learning environment. Every table

is provided with adequate stationary supplies. Individual student activity folders, intended learning materials and name-cards are placed at each student's designated seat. Post a quick formal greeting session, students are expected to wear their name-cards and now are ready to learn!

Teachers are keen not only on 'what students learn', but also on, 'how they learn'. Colour, descriptive visuals are used to transform an ordinary, mundane space into a lively and special learning zone. Students' interests, enthusiasm and energies are channelled into creative, personalized learning activities. Teachers largely adopt "learning by doing" child-centred methodologies such as (art and crafts based) descriptive worksheets; story telling and role-play; collective reading; quizzes; flash-card games; read aloud board games; poems and rhymes; live demonstrations; watching animations and educational videos; creating personalized albums; to ensure a dialogic environment.

Students are rewarded with 'motivation-stickers' based on their levels participation and performance during lessons. These stickers are pasted onto their name-cards. At the end of each term, student with the most stickers is awarded with a special prize. This extrinsic motivational approach drives students to actively participate and perform well in classroom. This creates a certain level of competition. Teachers ensure that equal/more opportunities are provided to academically weaker students to actively participate in lessons and achieve intended learning goals. This ELL has its own small reading corner. Students can freely select a book to read during free-time after lessons.

The Figures 24 provides snapshots of ELL.



Figure 24: Snapshots of English Language Lab

4.1.2 P.4-P.6 ELS Classrooms

The Figure 25 provides a generic spatial layout of P.4 to P.6 classrooms during three routine scenarios:



Scenario 3: Collective reading setting



English Subject Teacher (EST)

Figure 25: Spatial layout of P.4 to P.6 ELS classrooms

Teaching within these classrooms mainly involves formal, drilling methodologies and is confined to their own classroom space. IT is used as a tool for projecting and sharing e-textbooks and designing lessons plans based on slide shows so as to facilitate question-answer sessions. Routine pedagogical activities involve oral and written dictations; tests; quizzes; group-tasks; story-book reading workshops; worksheets and assignments; formal instruction; etc. All Q&A quizzes are supported by points evaluation system (as a part of formative assessment). Most students compete with one another to earn more points for their groups. Using textual and visual flash cards is used as a common alternative pedagogical approach to regular classroom teaching.

Certain interesting patterns were sighted. Students are grouped based on proximity and convenience, so they interact with only certain peers. When few students are absent or on leave, this imbalance forces teachers to adjust remaining students to form new groups. Group activities do not ensure active participation nor collaboration of members within the group. Students with higher abilities tend to create a leader effect. From the teachers' shared perspective, having standard group formations help them to conveniently execute lessons, saves time and effort and facilitates easy evaluation during assessments. Due to the limitations of lesson time, tight curriculum schedule and set learning targets, most teachers tend to follow the English textbooks pattern strictly and solely.

Six core approaches/methods were identified during participant observations:

1) Grammar Translation method (GTM): Its focus is on learning the accuracy of rules of grammar. Classes are partially taught in translations from mother tongue into the target language and vice versa (Stern, 1983). Students learn more about the language than the language itself (Lindsay & Knight, 2006). Through this drilling approach, students only practice and refine their reading and writing skills. Vocabulary, grammar and punctuation are learned through this translation of isolated words and sentence structures.

2) Direct method (DM): Any foreign language could be taught without translation or the use of the learner's native language if meaning was conveyed directly through demonstration and action (Richards & Rodgers, 2001). In this phonetic, natural method, target language is used as a means of instruction and communication in the language classroom (Stern, 1983). Emphasis on spoken word and great stress is put on correct pronunciation (Lindsay & Knight, 2006). It includes lots of oral interaction, spontaneous use of language, and little or no analysis of grammar rules. Vocabulary is taught through demonstrations, objects and pictures, and abstract vocabulary is

taught through association of ideas.

3) Audio-Lingual method (ALM): Audio-Lingual Method (ALM) tries to develop target language skills without reference to mother tongue, with a strong emphasis on listening and speaking skills (Stern, 1983). It is based on stimulus-response-reinforcement model, involving drilling (Harmer, 1991) and dialogues. Vocabulary is learned only in context. Its objective is to give students the ability to respond quickly and accurately in any speech situations and provide sufficient knowledge of vocabulary to use the grammar patterns (Orwig, 1999).

4) Total Physical Response method (TPR): It is a teaching technique that enables students to acquire new English vocabulary by listening to and carrying out spoken commands. The teacher models the action as she speaks the vocabulary words using body gestures, facial expressions, pictures and props. The teacher continually repeats and reviews them until the students can carry out the commands without any difficulty. Acting, performing and listening are very important. Only concrete vocabulary connected with actions is taught. No grammar is taught.

5) Present, Practice, Produce (P-P-P): The "Three Ps" approach to language teaching is the most common modern methodology employed by schools. It works in progression of three sequential stages (Doff, 1988; Bryne, 1986).

Presentation: The teacher presents new words or structures, gives examples, writes them on the board, etc. New language is presented perhaps as a grammatical pattern or within some familiar situation. During this phase, the teacher is often very active and dominates the class.

Practice: Students identify, repeat (through individual and choral drills) and manipulate the new language structure in a controlled way (e.g. Making sentences, asking and answering questions, describing a picture). Practice can be oral or written.

Production: Students attempt to use acquired language to express themselves more freely (e.g. Talk/write about their personal thoughts, interests, opinions in different contexts or situations). Production can be oral or written.

P-P-P is criticised as being too linear, behaviourist (Ellis, 2003) and highly teacher-
centred (Harmer, 2007). On the other hand, Swan & Thornbury (2005, 1999) defend that P-P-P allows teachers to control pace and content of the lesson with the feasibility of "practice makes perfect" notion. With the onset of TBL into language classrooms, researches often confront the dilemma of selecting TBL over P-P-P or vice versa. P-P-P approach is highly efficient in teaching/learning grammar accuracy and structure. Whereas TBL is vital for understanding where/how to use this acquired grammar and vocabulary accuracy in contextual (real-life), meaningful, diverse situations for the purposes of communication.

6) Task Based Learning (TBL): In TBL learning is promoted by giving students tasks to complete while using the target language (Lindsay & Knight, 2006). "Tasks are believed to foster processes of negotiation, modification, rephrasing, and experimentation that are at the heart of second language learning" (Richards & Rodgers; 2001, pp. 228).

Nunan defines (1989, pp.4)

...the communicative task [is] a piece of classroom work which involves learners in comprehending, manipulating, producing or interacting in the target language while their attention is principally focused on mobilizing their grammatical knowledge in order to express and in which the intention is to convey meaning rather then form. The task should also have a sense of completeness, being able to stand alone as a communicative act in its own right with a beginning, a middle and an end.

TBL is based on three stages (Willis, 1996): 1) *Pre-task phase* - Introduction of topic/task/ new words by teacher. 2) *Task cycle*- Students do the task, students prepare a report or a presentation. 3) *Language focus* - Analysis of new features and practice.

The aim is to explore, listen and speak through self-teaching. Grammar is explained afterwards. Teacher is advisor and initiator, whereas, students are explorers and investigators. During TBL, learners are provided with many opportunities to practice and recycle the vocabulary or structures that they have just been taught. TBL activities (e.g. Writing a diary, designing a poster, creating a party invitation letter, planning a holiday, etc.) are conducted either in groups or as individuals. Teachers try to reflect diverse situations in which target language might be used by the students and also

types of activities in which students can practice certain functions of language. Task based learning, in context to Hong Kong ELS curriculum, will be discussed in detailed in Chapter 4, section 4.2.2.

Specific learner traits commonly observed among most P.4-P.6 learners were: Lack of confidence in effective use and fluency in English speaking and reading skills. Pronunciation issues with certain words. Grammatical, spelling and punctuation errors in writing skills. Lack of active participation of weaker students in class activities and short attention span. Lack of interest in silent reading sessions. More enthusiasm and activeness in collaborative learning sessions with peers such as group tasks. However, individual participation/contribution often gets overshadowed with leader effect. Tangible board games and card games are rarely adopted in classroom instruction. Teachers are keen to adopt and integrate playful activities and games, to break the monotony of routine teaching. It takes time for a language to develop (Willis, 1996). Games can help enhance motivation and engagement and provide meaningful experiences, especially to children with low academic abilities and SEN students. But the challenging question lies, "How?". These initial field observations highlighted the strong need for integrating didactic games in P.4-P.6 ELS classrooms.

The Figure 26 provides a snapshots of P.4-P.6 ELS classroom environment.



Figure 26: Snapshots P.4 to P.6 ELS classrooms

4.1.3 Initial game experiment in P.5 ELS classrooms

An initial experiment was conducted among P.5 students. The game was based on Chapter 3 of Primary Longman Elect textbook 5(A). The lesson introduces the vocabulary about various clothing items and accessories. Specific language focus aims that students should learn when to use *"in"* and *"with"* for clothing items and accessories.

Q. Who's the boy/girl, in/with (clothing/accessories)?
A. (Name) is the boy/girl who is wearing/carrying (clothing/accessories)?
E.g. Who's the boy in pants? OR Who's the girl in a dress?
Who's the boy with glasses? OR Who's the girl with a bag?

This experiment was conducted during the lunch recess. 13 (P.5) students (from classes A, B, C, D) were randomly selected. The card game aims to provide opportunities wherein students interact using the specific "language focus" while playing the game.

The game components: 20 x picture cards (10 x blue cards and 10 x pink card), 4 x Player number cards and 1 x dice.

No. of Players: 4-5 players.

How to play the game? Students form groups of four or five. Each group gets a pack of 20 cards, 4 number cards and one dice. Each student randomly selects a number card (1, 2, 3, and 4). They shuffle and distribute 20 playing cards. In a group of 4, each student gets 5 cards, and in a group of 5, each student gets 4 cards. Students take turns to roll the dice. Student with card no. 1 rolls the dice first.

For instance, he/she gets number 4 on the dice. He/she then asks a question to the student no. 4 using the language focus -"Who is the boy/girl in/with ______ (clothing/accessories)? Student no. 4 looks at his/her cards. If she/he does not have the card with specified clothing or accessories, he/ she answers. "No one!." If Student no. 4 has the card with specified clothing or accessories, he/she answers. "______ is the boy/girl in/with______(clothing/accessories)." Player 4 gives this card to Player 1. In exchange, Player 1 has to return any other waste card to Player 4. Now it's the turn of Player 2 to roll the dice. Its important to note that the number on the dice decides to whom the question is to

be asked. At any point of time in the game, all players have equal number of cards. If a student rolls the dice and gets an "X", he/she skips that turn. The 1st player to collect four cards with any identical clothing or accessories, wins!

The Figure 27(a) provides snapshots of P.5 students playing, and the card game itself.



Figure 27 (a): Snapshot of experiment 1

The duration of game-play is about 10-15 minutes. Post the game-play session, students complete a task worksheet for learning assessment (as shown in Figure 27 (b)).



Figure 27 (b): Worksheets for learning assessment

4.1.4 Observations and Findings

The attractive, yet simple graphics generated curiosity and enthusiasm among students to know more about the game. After explaining the rules, students were engaged in game-play. Each student was actively participating as an individual player. As players, they were alert in listening and responding to questions. This game enabled students to come out of their comfort zone and to try using English in oral communications. It helped students to store the learning content (acquired knowledge) through fun-oriented repetitive rehearsal (of using specific language focus and vocabulary words), into their long-term memory.

The dice, as an element of randomness and chance, created contest and tension in the game. In the

spirit of playing a game, students were not embarrassed in making mistakes or asking for assistance from more capable peers. During difficulties, students at first tried to accomplish the task with assistance from more capable peers or the teacher but later, they were able to perform the task independently. This created opportunities for Zone of Proximal development (ZPD) (Vygotsky, 1978) and scaffolding, a metaphor used in teaching and learning that describes a system of temporary guidance offered to the learner by the teacher, jointly constructed, and then removed when the learner no longer needs it (Tharp & Gallimore, 1988). Students model each other and concurrently guide one another, thus making them one step closer towards mastering the skill (Ibid).

Leader effect often seen during group work, was not visible. Players were voluntarily using specific English 'language focus' to communicate with one another. Some students struggled in recalling certain English vocabulary words. Such students (when not closely monitored by their teacher) do not linguistically challenge themselves and eventually reverted back to using (mother-tongue) Cantonese (Littlewood, 2004). There needs to a constant revision of English vocabulary, as most students tend to forget it, if not practiced/used regularly.

Games should cater to learner diversity. Adequate textual information (on vocabulary/language focus) must be provided when designing for lower ability students. This learning session was highly enjoyable for students. The game itself, intrinsically motivated them to perform the task and learn. There was no need to reinforce motivation with extrinsic rewards. Learning attitude and motivation help anticipate achievement (Deci and Ryan, 1985). Extrinsic motivation (such as rewards, prizes, scores) often overpowers the experience of meaningful learning. In contrast, intrinsic motivation drives an individual towards self-direction and self-determination (Little, Hammond and Collins 1991).

Thus, one can clearly see the potential of integrating simple games within classrooms to facilitate active engagement, motivation and meaningful collaborative learning with their peers. To solve the apprehension on how to monitor students' performances during didactic games, an activity sheet was designed to foster effective writing skills. The students were given these work sheets as a post game-play task. This also helped teachers to consolidate the learning activity; understand students' learning outcome and identify areas that need special attention (E.g. Grammatical and spelling errors).

4.2 Hong Kong Primary ELS curriculum

4.2.1 Goals and objectives

Three interrelated Strands support the subject target of English Language (CDC, 2002): *Interpersonal Strand (IS): T* o use English to establish and maintain relationships; to exchange ideas and information; and to get things done.

Knowledge Strand (KS): To use English to provide or find out, interpret and use information; to explore, express and apply ideas; and to solve problems.

Experience Strand (ES): To respond and give expression to real and imaginative experience.

The ELS Curriculum focuses on developing all four language skills:

- 1. Listening: Identify and discriminate sounds, stress and intonation
- 2. Speaking: Clear, coherent presentation of information, ideas, feelings
- 3. Reading: Understand the basic conventions of written English
- 4. Writing: Use basic conventions punctuation, grammar, spellings, vocabulary, etc.

The Figure 28 (below) illustrates the roles of English teachers as defined by the HK Education Curriculum Guide (2002):



Figure 28: Roles of English Teachers (ELSCDC, 2002)

Textbooks are the basic learning materials to support learning and teaching. However, the ELS curriculum framework encourages teachers to adopt a wide range of learning and teaching resources other than textbooks (such as stories, poems, songs, rhymes, cartoons, information books, children's magazines, children's encyclopedias, picture dictionaries, language games, multimedia resources, IT tools and other authentic materials) to arouse interest, broaden learning experiences, enhance learning effectiveness and meet different learning needs and styles (ELSCDC, 2002).

From the context of my research, didactic games can be used as an alternative and effective pedagogical tool as they provide frequent opportunities for enriching and testing the four language skills - reading, listening, writing and speaking during interactions with peers. I aim to build connections between defined roles of the teachers; textbook contents; and the ELS curriculum learning objectives to overcome/solve the current practical issues in teaching/learning within P.4 and P.5 ELS classrooms.

4.2.2 From Present, Practice, Produce (P-P-P) to Task-Based Learning (TBL)

"Teaching efficiency is improved when the learners and their learning are the focus of attention instead of the teacher and his/her teaching" (CDC, 1997, pp. 13; 1999a, pp. 4). The Hong Kong education system focuses on 'Task-Based Learning (TBL)' in context to language teaching (Littlewood, 2004). Students perform tasks wherein theoretical knowledge is applied in practical, meaningful and 'real-life' like experiences.

The Cambridge International Dictionary of English (1995) defines *task* as 'a piece of work to be done, especially one done regularly, unwillingly or with difficulty'. The Oxford English Dictionary (1989) define *task* as 'a piece of work imposed, exacted, or undertaken as a duty or the like', or 'a portion of study imposed by a teacher'. These definitions, seem meaningless in context to learner-centred education system.

Willis (1996, pp. 23) defines, "Tasks are activities wherein the learner uses the target language for a communicative purpose (goal) in order to achieve an outcome." Skehan (1998) describes the five key characteristics of a task: Meaning is primary. Learners do not just merely accept or repeat other people's given meaning. It has some sort of relationship to comparable real-life activities. Task completion has some form of priority. Assessment of the task is based on the outcome. Littlewood's (2004) acronym for T.A.S.K. is **T**ogether (speaking/silently), **A**ctivate (purposefully),

Skills (communicative, cognitive, interpersonal) and **K**nowledge (from all domains of experience). Estaire and Zanon (1994: pp.13–20) state that there are two main categories of task: *enabling tasks (exercises)*: The main focus is on linguistic form (grammar, vocabulary, pronunciation, functions, and discourse) and *communication tasks*: The 'learner's attention is on meaning rather than form. The Hong Kong CDC (1999a, pp.44) defines "Exercises are learning activities wherein students focus upon and practise specific elements of knowledge, skills and strategies needed for the task without a communicative purpose". However, Littlewood (2004) argues that without the knowledge in formal aspects of a language (grammar, pronunciation or vocabulary), 'communicative competence' cannot be attained. He (2004) adds that a task has two dimensions - the continuum from 'focus on forms' to 'focus on meaning' and the degree of learner-involvement elicited within a task. In Figure 29, he (2004) illustrates the continuum diagram for TBL wherein each of the five categories describe examples of learning activities.

Focus on form	+		→ Fo	ocus on meaning
NON- COMMUNICATIVE LEARNING	PRE- COMMUNICATIVE LANGUAGE PRACTICE	COMMUNICATIVE LANGUAGE PRACTICE	STRUCTURED COMMUNICATION	AUTHENTIC COMMUNICATION
Focus on the structures of language, how they are formed and what they mean.	Practice language with some attention to meaning, without communicating new messages to others.	Practising language in a context where it communicates new information.	Using language to communicate in situations, which elicit pre-learnt language, but with some entropy.	Using language to communicate in situations where the meanings are individualistic.
Involves substitution exercises, discovery and awareness raising activities.	Involves question and answer practices.	Involves activities that fill in information gap or personalized questionnaires.	Involves structured role-play and simple problem solving.	Involves creative role-play and complex problem solving and discussion.
E.g.: Discovering a rule of grammar. Students apply a rule to a new set of examples: Q. We play football in the evening. (often) A. We often play football in the evening	E.g.: Question and answer practice. Students answer questions about a situation, topic, or a picture: Q. Have you eaten your lunch yet? A. No, I haven't eaten my lunch yet.	E.g.: Each student is given either of the 2 pictures of a boy's room. One is untidy and the other is tidy. They describe the picture as: A. He hasn't folded the blonket wet	E.g. Ur (1988, p. 117), designed an activity wherein students use 'future tense' to describe what they plan to do during a holiday at an island. They are given a map of a holiday island for reference	E.g. the language used depends on the meanings that arise naturally in the course of communication. Students are asked to write a plan for a surprise birthday party for their teacher.
Analytic learning 'Exercises'	+ +	(FIIIs 2000)	→ E) →	periential learning 'Tasks'
'Enabling Tasks'	+ (Esto	ire. Zanon: 1994)	-> 'Cor	nmunicative Tasks'
'Exercises'	+ Exerci	ise-tasks (HKCDC, 19	197) →	'Tasks'

Figure 29: The continuum diagram for TBL (Littlewood, 2004)

The column on the left-end comprises of 'exercises', whereas the column on the right-end consists of 'tasks'. Activities within the middle three columns are an amalgamation of both. These 'half-and-half' activities have significantly helped Hong Kong teachers to gradually implement task-based learning and are collectively described as 'exercise-tasks' (Morris et al., 1996; Littlewood, 2004). One can see a clear connection between the notions of task-based learning to John Dewey's (1912) 'psychology of occupation'.

4.3 Summary

The pilot study helped me identify and compare the contrasting teaching/learning situations between P.1-P.3 and P.4-P.5 ELS classrooms. This transition seems was quite abrupt and large. I decided to pursue and focus my research within P.4 and P.5 ELS classrooms. I strongly felt that this is the domain that needs attention and where my research would have a substantial impact.

Instructional materials must facilitate learners to become active contributors to their language learning rather than passive recipients of knowledge. Learning is an active, constructive, cumulative, and self-directed process that is dependent on the mental activities of the learner (Shuell, 1986; Sternberg, 1996). Memory and learning both require the learner to actively construct new knowledge and strategies (Rumelhart and Norman, 1981). Students need to constantly rehearse, organize and use this acquired new knowledge. Active engagement coupled with personal experiences can lead to meaningful elaboration. This would help students to connect new knowledge to real life experiences and promote long term learning.

Chapter 5: Four game experiments

This chapter outlines the four, main (didactic) game experiments which were conducted within nine P.4 and P.5 ELS classrooms at STCPS. It is divided into five sections.

The first section draws attention towards the prerequisites prior to conducting these experiments. Sections two to four, elucidate the four (didactic) game experiments conducted within P.4 and P.5 ELS classrooms. This elaboration outlines the aims, apparatus, methodology and observations. The feedbacks are based on personal reflections drawn from observations, and insights gathered from nine ELS teachers.

The last section summarizes interesting insights that are essential for designing didactic games for classrooms.

"Play gives children a chance to practice what they are learning." (Fred Rogers)

5.1 Background

The main study span stretched from 11th March to 12th July 2013. In-depth field studies were conducted for 126 double sessions across 14 weeks. Each double session lasted for 70-80 minutes. The schedule for conducting these field observations, followed by field experiments within nine P.4 and P.5 ELS is shown below in Figure 30.

TIME	MON	TUE	WED	THU	FRI
8:15-8:35	Class Teacher's Lesson				
8:35-9:15	1000				
9:15-9:50	SC				4D
9:50-10:05	1 st Recess (15 minutes)				
10:05-10:45	40	CEN			
10:45-11:20	48	SEN	50		
11:20-11:35	2 nd Recess (15 minutes)				
11:35-12:15				10	
12:15-12:50			4A	4C	
12:50-13:50	Lunch (60 minutes)				
13:50-14:30			60		
14:30-15:10			58	5A	
15:10-16:30	Extra				

Figure 30: Schedule for main study

Some prerequisites for conducting these experiments are as follows:

All experiments were scheduled for the second term of 2012-2013 annual school calendar and conducted within the naturalistic environment of P.4 and P.5 ELS classrooms double lessons (70-80 minutes) and in synchronization to the ongoing teaching schedule. On the first day of the new lesson, the teacher's instruction on the vocabulary and language focus is based on the Primary Longman Elect textbook pattern. Students were given assignments as outlined by the textbook. During these sessions, I closely observed and studied the regular teaching/learning patterns and styles. The following week when there is a double lesson, the teachers conduct these experimentation sessions. The aim, apparatus and methodology of the game based experiments were explained and discussed with all ELS teachers beforehand. After receiving all the intended teaching/learning materials, each teacher was given the freedom to conduct these experiments in their own personal style within their classrooms, while I conducted participant observations.

Sample size: 105 P.5 students Sample size: 103 P.4 students 44 5A 48 58 4C 5C 4D SD SEN students ð 27 30 16 20 24 28 32 36 12 15 18 21 24

The Figure 31 shows the gender and class distribution of students in P.4 and P.5.

Figure 31: Gender and class distribution of students in P.4 and P.5

All worksheets were used as formative assessments by the school. Post all the experiments, students were asked to complete a questionnaire-based survey (as shown in Appendix C) about their personal experiences during these lessons. They were asked to intentionally not reveal their identity (by just notifying their gender and not their individual names) in the questionnaires in order to receive real, authentic feedback.

The Principal and English Language Subject Head monitored the lesson in the presence of the Local English Teacher (NET) and English Language Teaching Assistant (ELTA). Individual semi-structured interviews of all nine ELS teachers were conducted in order to gather their unadulterated, personal insights and suggestions for improvement. Each of the four didactic games are based on a specific chapter from the Primary Longman Elect P.4 (B) and P.5(B) textbooks. These experimentations are based on the defined structure and pattern for teaching/learning clearly stated in the Primary Longman Elect P.4 (A, B) and P.5(A, B) textbooks were conducted.

5.2 P.5 Experiment 1 (Hong Kong on wheels)

The educational board game "Hong Kong on wheels" is based on Chapter 4 (two practices) from the Longman Elect Primary 5 (B) English curriculum textbook. It was conducted in synchronization to the ongoing teaching schedule for two double lessons (for duration of 70-80 minutes) across two consecutive weeks (as practice 1 and practice 2) in four P.5 classes.

Based on Mojzisek's model (1975), a didactic game consists of four main parts:

1) The game environment: 1 x board (Hong Kong map); 12 x markers; 12 x Q (question) cards; 12 x answer cards (4 x green, 4 x pink, 4 x yellow).

2) The game targets: The game primarily focuses on the teaching/learning of vocabulary words (modes of transport in Hong Kong) with two specific language focuses within the context of everyday life in Hong Kong (famous landmarks in Hong Kong). During the initial week, Practice 1 was the area of focus:

Q1. How long (time) does it take from (<u>Place A</u>) to (<u>Place B</u>) by (<u>mode of transport</u>)? A1. It takes _____ hours and _____minutes. / It takes _____minutes.

3) The game procedure itself, determined by rules: At first, the teacher starts the lesson with a short power point presentation which introduces students to various tourist attractions (places) in Hong Kong. Post this session, students form groups of 3 or 4. Each group receives a set of game components. Each player randomly selects 3 answer cards each. The bundle of 12 Q cards is placed in the centre. Players take turns to pick up a Q card. Player A picks up a Q card and asks the question to his/her peers using the language focus -"How long does it take to travel from ______ to _____ by ____ (chooses a mode of transport)?" After listening to the question, the students look for the appropriate card. Player C has the corresponding answer card. He/she answers using language focus - "It takes _______ minutes / ______ hour(s) and _______ minutes." If the answer is correct, Player C puts a "marker" on "to location" on the map. Now Player C picks up the next Q card and asks another question. After listening to the question, the students look for the appropriate card. He/she answers using the language focus - "It takes ________ minutes." If the answer is correct, Player B has the corresponding answer card. He/she and asks another question. After listening to the question, the students look for the appropriate card. Player B has the corresponding answer card. He/she answers using the language focus - "It takes ________ minutes." If the answer is incorrect, Player B puts the Q card back into the bottom of the pile and he/ she cannot put a "marker" on the map. Player C picks up a new question card. The 1st team to finish all the places on the map (or put 12 markers on the map) wins!

The Figure 32(a), provide snapshots of the game based experiment 1 (Practice 1).



Introductory powerpoint presentation session

Figure 32 (a): P.5(B) Chapter 4, Practice 1 game-based experiment

4) The final game assessment: After the game, students complete the worksheet (as shown in Figure 32 (b)).

		Date:	
Class: P 5		Grade:	
Q. How long does it take to	a travel from the Avenue of Stars to	the Wetland Park by bus	7
A. It takes 70 minutes.			
A. It takes an hour and 10	minutes,		
Choose 3 cards and mak	e sentences.		
2.000 C 2.000 C 2.000	0.000.000.00		
Q. How long does it take to tr	avel from		to
	by		
4			
A			
A			
0. How long			.to
n	by		to ?
A	by		to 7
A	by		to 7
A	by		7

Figure 32 (b): P.5(B) Chapter 4, Practice 1 worksheet

During the consecutive week, Practice 2 was the area of focus.

1) The game environment: 1 x board (Hong Kong map); 2 x pink dices, 2 x green dices, 2 x yellow dices; and 6 x markers.

2) The game targets: The game primarily focuses on the teaching/learning of specific language focus:

Q2. How far (distance) is it from (Place A) to (Place B)?

A2. It's not far. It's _____ kilometres. / It's a long way. It's _____ kilometres.

3) The game procedure itself, determined by rules: The teacher first revises the lesson (learnt the day before) and then introduces the second language focus with a short introductory power point presentation. Later, students form groups of four. Each group receives the Hong Kong map and 2 dices (of same colour): Group 1 gets two green dices, Group 2 gets two pink dices and Group 3 gets two yellow dices respectively. Students take turns to roll both dices. Student A rolls the two dices. Based the 2 places shown on the 2 dices, student asks the question using the language focus -"How

far is it from ______ to ____?" to his/her group-mates. After listening to the question, the students look for answer (calculate the distance) on the Hong Kong map. Student B tells the answer using the language focus – "It's not far. / It's a long way. It's ______kilometres." If the answer is correct, the student puts a "marker" on that place on the map.

Now Student B rolls both dices together and asks another question. Student C answers the question. If the answer is incorrect, Student C cannot place the marker on the map. Student B rolls the two dices again. When a Student rolls both the dices, and the places shown on dices already have a marker on the map, he/she misses a turn. The 1st team to finish all 6 places on the map (or puts markers on all 6 places on the map) WINS!

Note: Students can increase complexity of the activity by choosing dices of two different colours. For example, if a group selects (1 green dice + 1 yellow dice) or (1 green dice + 1 pink dice) or (1 yellow dice + 1 pink dice), then they need to calculate (sum up) longer distances on the Hong Kong map. So the game involves basics of (addition) mathematics in order to play the game.

The Figure 32 (c), provides snapshots of the game based experiment 1 (Practice 2).



Figure 32 (c): P.5(B) Chapter 4, Practice 2 game-based experiment

4) The final game assessment: After the game, students complete a worksheet (as shown in Figure 32 (d)).



Figure 32 (d): P.5(B) Chapter 4, Practice 2 worksheet

5.2.1 Participant observations

This educational game kit consisted of 10 sets of the game, game instruction sheet, corresponding two worksheets and one introductory Power Point presentation CD. The introductory Power Point presentation helps the teacher in shaping the student's learning. Shaping involves breaking down of the task (lesson) into a series of steps and small approachable goals and therefore simplifying the task for the child (Tharp and Gallimore, 1988). The presentation also helps students to get familiar with, recall and understand certain vocabulary words (types of transport and famous landmark places in Hong Kong) and language pattern. Most students were aware of the Cantonese names but were unaware of the English names for the famous landmarks in Hong Kong.

The game generated curiosity and enthusiasm among students. After explaining the task, the students were immersed in the task. 'Leader effect' was absent as students actively participated as individual players. Most students communicated with one another in English but sometimes used Cantonese as well. It is observed that during difficulties, students take assistance from more capable peers and their English teachers and later are perform independently, thus creating opportunities for Zone of Proximal development (ZPD) (Vygotsky, 1978) and scaffolding. Students gradually master the skill through repetitive play and imitation (Tharp & Gallimore, 1988). "Games enhance

repetition, reinforcement, retention and transference" (El-Shamy, 2001; pp.10). Each player's turn deals with the same concept (learning objective) or skill in a different way. Students learn not only from their own turn, but also from peer's turn. The teachers closely observed and monitored the session rather than just dictating commands. Students were able to use all four language skills (reading, speaking, listening and writing). Most groups finished playing the game within allotted time of 20-30 minutes. It provided opportunities for the more capable students to voluntarily increase the complexity of the game by exchanging dices of different colours.

5.2.2 Feedback

The Figure 32 (e), provides feedbacks through questionnaire-surveys of 105 P.5 students (Appendix C) on the game and worksheets.



Figure 32 (e): P.5 students' feedback on game-based experiment 1

During the game, every student contributes his/her share as "individual player" thus ensuring active participation. Students within each group collaborate with one another through co-operative parallel play in order to compete with the other groups within their classroom. Parten (1932) defines "During cooperative play, players join together in pairs or form groups and often adopt roles to coordinate activities in a meaningful way, in order to attain a common goal. However, during parallel play, children (as a group or an individual) play adjacent to one another and share common goals but have low levels of interaction among one another". The game amalgamates 'communicative' aspect of English language use with other core subjects of Hong Kong Primary curriculum, i.e., Mathematics (number operation) and General Studies.

Integrating individual worksheets at the end of the activity is useful for getting an instant feedback of the students' learning performance. Teachers suggested that having six dices creates confusion. Furthermore, sharing game components encourages certain groups to sit idle and wait for other groups to complete the task.

Simplification and clarity is required in planning levels of difficulty (low, medium and high) in order to cater to the diverse abilities of learners. During instances when students need to calculate longer distances, the game needs to have an answer sheet for cross-checking their resulting answers. There also needs to be "bonus elements" wherein students can have freedom of selection or have a feeling of successfully accomplishing a difficult task. However, it would be more challenging and interesting to explore ways in which exercises form an integrated part of the game itself.

The entire lesson called "Hong Kong on wheels" can be studied into two aspects. The cooperativeparallel play based game in itself can be considered as a 'task', whereas the worksheet is the 'exercise' for English language teaching/learning. During interviews, all four P.5 English teachers voluntarily agreed that adopting simple games such as "Hong Kong on wheels" as "enjoyable exercise-tasks" would enhance motivation and engagement during the classroom lessons, especially for children with low academic abilities and SEN students.

Such games encourage students to come out of their comfort zone and to attempt using English language for communication purposes. In the spirit of playing the game, most students were not embarrassed in making mistakes or asking for assistance from more capable peers.

5.3 P.5 Experiment 2 (Police stories)

The educational board game "Police stories" is based on Chapter 5 (Practice 1) from the Longman Elect Primary 5 (B) English curriculum textbook.

1) The game environment: 2 x game boards of Sai kung village house (1 x green , 1 x brown); 1 x dice; and 10 x markers.

2) The game targets: The game is based on a short police-story involving a robbery that happened at 9 p.m in a house in Sai Kung area of Hong Kong. It primarily focuses on the teaching/learning of vocabulary words (residents involving in household chores while a robbery happened in a neighbourhood) with specific language focus:

Q1. What was ______(name, he/she) doing at that time? What were ______(they, > 2 people) doing at that time? A1. He /she was _____ing _____. OR They were _____ing _____.

3) The game procedure itself, determined by rules: The teacher first starts the lesson with a short introductory power point presentation. This power point introduces students to the story line of a robbery that happened in Sai Kung, Hong Kong. Post this session, students play the game in pairs. Each pair of students receives the game components. **NOTE:** Student A gets a green-house game board with 5 x markers and student B gets a blue-house game board with 5 x markers. The number on the dice corresponds to the house number on the game board. Based on the number on the dice, Student B looks for the answer on the game board. There are 6 houses within each Sai Kung village building shown on the game board. Out of the 6 houses, there is a robbery in one of the houses.

Student A rolls the dice. Student A asks the question using the language focus -"What (was/were) _____ doing at that time?" to Student B. Student B tells the answer using the language focus – "He/ she was / they were _____ ing." If the answer is correct, the Student A puts his/her "marker" on that house window on Student B's game board. Now Student B rolls the dice and asks the question using the language focus -"What (was/were) _____ doing at that time?" to Student A. Similarly, Student A looks for answer on the game board and tells the answer using the language focus – "He/she was / they were _____ ing." If the answer is correct, the Student B puts his/her "marker" on that house window on Student B tells the answer using the language focus – "He/she was the language focus – "Itels the answer using the language focus – "He/she was / they were ______ ing." If the answer is correct, the Student B puts his/her "marker" on that house

window on Student A's game board. If the number shown on the dice corresponds to the house where the robbery has happened, then student gets an extra turn to roll the dice again. If a student rolls a dice, and the house shown on the game board already has a marker on it, then he/she misses that turn. The 1st player to finish all the 5 places on each game board (or puts markers on all 5 places) WINS! The Figure 33 (a), provides snapshots of the game based experiment 2 (Practice 1).



Figure 33 (a): P.5(B) Chapter 5, Practice 1 game-based experiment

4) The final game assessment: After the game, students complete the worksheet (as shown in Figure 33 (b)).



Figure 33 (b): P.5(B) Chapter 5, Practice 1 worksheet

5.3.1 Participant observations

This game enabled students to work in pairs and to use all four language skills (reading, speaking, listening and writing). The game-play duration was 15-20 minutes. Incorporating the use of dice as an element of chance, complimented the activity. The game board is designed in a manner in which information is hidden below the window of a specific house. Hence, prior to this, the other peer is ignorant of this information. This "information gap" forms the underlying structure of communication in didactic games. However, if students indulge in repetitive play, they can guess or recall this information from their memory. The game no longer serves the purpose of asking a question. In such a scenario, this game can be highly predictable, limited and uninteresting. Hence, games (like this) should provide the students with freedom to select and arrange information themselves. This would further enhance the game-play experience as students will be more engrossed and curious

during game-play.

5.3.2 Feedback

The Figure 33 (c), provides feedbacks through questionnaire-surveys of 105 P.5 students (Appendix C) on the game and worksheets.



Figure 33 (c): P.5 students' feedback on game-based experiment 2

Integrating individual worksheets at the end of the game experiment helped teachers to get immediate feedback through formative assessment. The entire lesson can be regarded as an exercise-

task. Almost, 49% of the students thought that the game was quite easy. Teachers suggested that the game needs more elements of playability. Although the game supported rehearsal and use of specific language focus in communication, the structure and design of the game did not generate enough enthusiasm among students. Just having pictorial information on the game board was sighted as a major drawback. Few SEN students needed textual clues to be able to conduct effective communication to reach intended goals. These valuable insights were considered and kept into account while designing games for Hong Kong P.4 ELS classrooms. "Games can be effective tools for learning because they offer students a hypothetical environment in which they can explore alternative decisions without the risk of failure. Thought and action are combined into purposeful behaviour to accomplish a goal." (Martinson and Chu 2008, pp. 478).

5.4 P.4 Experiment 1 (How to be a star pupil?)

The educational board game "How to be a star pupil?" is based on Chapter 5 (two practices) from the Longman Elect Primary 4 (B) English curriculum textbook.

1) The game environment: 1 x goal game board (Hong Kong map); 12 x resolution talk bubbles (two of each of the six colours); and 1 x coloured dice (six colours)

2) The game targets: The game primarily focuses on the teaching/learning of vocabulary words (good and bad student habits) with two specific language focuses within the context of everyday student life (resolutions).

E.g. I am going to (good habit). Then, I will be (resolution).

E.g. I am going to eat less junk food. Then, I will be fit and strong.

3) The game procedure itself, determined by rules: Students form groups of 2 to 6 (depending on class size). Each group receives the goal game board; 1 (colour) dice, and a set of 12 resolution cards (talk bubbles): 2 green, 2 pink, 2 yellow, 2 red, 2 orange and 2 blue. Place all 12 resolution cards (talk bubbles) beside the game board. Students take turns to roll the dice. Each face of the dice shows one colour.

Student A rolls the dice. Based on the colour shown on the dice, Student A picks up a corresponding card (talk bubble) of the same colour. He/she reads it aloud using the language focus -"I am going to

______ " to his/her group-mates. After reading the card, Student A matches the resolution card (talk bubble) to the corresponding goal mentioned on the game board and reads the goal aloud using the language focus - "Then, I will / won't ______ " to his/her group-mates. Similarly Student B rolls the dice. Based on the colour shown on the dice, Student B picks up another card (talk bubble) and reads it aloud using the language focus - "I am going to _____ " to his/her group-mates. Then, Student B matches it to the corresponding goal and reads the goal aloud.

Note: For each colour shown on the dice, there are 2 resolution cards (talk bubbles). If the colour on the dice matches the two cards already placed on the board, student skips that turn. The 1st team to finish matching all resolution cards onto the goal game board is the winner!



The Figure 34(a), provides snapshots of the game-play.

Figure 34 (a): Snapshots of P.4 game based experiment 1

4) The final game assessment: After the game, students complete a worksheet (as shown in Figure 34 (b)). In the worksheet, students are free to write their personal five resolutions in order to be a star pupil. Some of these resolutions can be similar to game, but teachers must encourage them to write alternative resolutions!



Figure 34 (b): P.4(B) Chapter 4, worksheet

5.4.1 Participant observations

This experiment was intentionally designed without any pregame aid (introductory power point). All five ELS teachers used their expertise and personal teaching styles to explain the rules of play to their students. Three teachers were comfortable and affluent in using the new teaching/ learning language material, while others struggled in explaining the game-rules clearly. Their explanations mostly involved a round of role-play session. Students used the strategy called 'rock, paper, scissors' in order to decide who will be the first player (and so on) to play the game. After explaining the rules, they were immersed in co-operative, competitive parallel play. This game provided with opportunities to nurture all four language skills (reading, speaking, listening and writing). The game-play duration was 10-15 minutes. Most students were able to perform the task independently. For weaker (SEN) students, it boosted their confidence by allowing them to use English in oral communication.

After one round of game-play, the higher ability students voluntarily increased the complexity of the game. They introduced "memory" aspect into play. They placed all the "talk bubble" cards upside down. During the game, an additional goal was set up. A player after rolling the dice, randomly picks

up a card. If the colour of the card matched the dice, he/she would perform the language focus task. Else, the card would be placed back to its original position upside down. All players needed to remember and recall which colour card is placed where so that the matching task can be performed. The coloured dice, unlike a numerical dice grabbed their attention. Students as individual players, actively participated and contributed within the team. Certain instances of ZPD and scaffolding were observed. Most students were comfortable in completing the task. The worksheets reflected every student's personal resolutions. In areas of difficulty (mostly involving spelling of new words), students would ask for assistance from peers or the teacher.

5.4.2 Feedback

The Figure 34 (c) provides feedbacks through questionnaire-surveys of 103 P.4 students (Appendix C) on the game and worksheets:



Figure 34 (c): P.4 students' feedback on game-based experiment 1

All teachers agreed that having an introductory power-point session facilitates clarity and convenience in conducting a lesson. Else they tend to feel unequipped in shaping the teaching/ learning process. Most students performed well in the worksheets. Common errors include spelling and punctuation.

5.5 P.4 Experiment 2 (Having good habits)

The educational board game "Having good habits?" is based on Chapter 6 (two practices) from the Longman Elect Primary 4 (B) English curriculum textbook.

1) The game environment: 1 x board game; 5 x activity cards (five colours); 5 x markers (five colours); and 1 x numeric dice.

2) The game targets: The game primarily focuses on the teaching/learning of vocabulary words (good and bad student habits) with two specific language focuses within the context of everyday student life (resolutions).

E.g. A asks, "How often do you (habit?)"

B replies, "I (habit) (once/twice/thrice/ x times) a (day/ week/ month/ year)."

A, advises <u>"It is a good habit."</u> or <u>"You ought to (habit) (once/twice/thrice/x times) a (day/ week/ month/ year)."</u>

3) The game procedure itself, determined by rules: First, teacher conducts an introductory powerpoint session (20 minutes). Students form groups of 2-5 students. Give each group the game board, one dice. Each group gets a set of five "having good habits" cards:1 green, 1 pink, 1 yellow, 1 red and 1 blue respectively. Every student randomly chooses a colour of "having good habits" card and corresponding marker. Students take turns to roll the dice.

Student A rolls the dice. Based on the number shown on the dice, Student A places his marker on the corresponding space on the game board. Student B asks the question aloud using the language focus - "How often do you ______" to Student A. After looking at his card, Student A looks the corresponding answer mentioned on the card. Student A reads the answer aloud using the language focus - "I ______ (once / twice / three times) a (day / week / month / year)" to his/her group-mates. Student B judges whether Student A's habit is good or bad. If Student A's habit is

bad, Student B advices him/her using the language focus, "You ought to_____." If the habit is good, the player stays on the given space. If the habit is bad, the player moves back to the initial space. Similarly, Student B rolls the dice. Based on the number shown on the dice, Student B places his marker on the corresponding space on the game board. Student C asks the question aloud using the language focus - "How often do you ______ " to Student B. After looking at his card, Student B looks the corresponding answer mentioned on the card. Student B reads the answer aloud using the language focus - "I ______ (once / twice / three times) a (day / week / month / year)" to his/her group-mates. Student C judges whether Student B's habit is good or bad. If Student B's habit is bad, Student C advices him/her using the language focus, "You ought to_____." Student B moves back to the initial space. The 1st player to reach the finish space, WINS!

The Figure 34(a), provides snapshots of the lesson and game-play.



Figure 35 (a): Snapshots of P.4 game based experiment 2

4) *The final game assessment:* After the game, students complete a worksheet (as shown in Figure 35 (b)). In the worksheet, every student had to mention his/her eight good habits and four bad habits. Then, students exchanged their worksheets with their partners (peer sitting adjacent to him/ her). Based on peer's personal habit card, student need to form sentences by giving advices.

Note: In the second round of game-play, students will use their personal habit activity cards to play the game.



Figure 35 (b): P.4(B) Chapter 5, worksheet

5.5.1 Participant observations

Most of the students immensely enjoyed this game. A sense of personal accomplishment was the highest in this game. In similarity to the previous experiments, teachers used the introductory power point presentation to explain the rules of play and in shaping the students' learning. This game can be played among two to five players. Hence, forming unequal groups was not an issue. The game nurtures confidence through repetition of specific language focus and vocabulary words. Players cannot proceed in the game, until fulfilling this game target. Every student participates as an individual player. The game facilitates effective use and mastery of four language skills (reading, listening, speaking and writing) through peer interaction. Conflict and contest is created through dice-oriented play. After explaining the rules, they were immersed in competitive play. The game-play duration was 10-20 minutes. Most students were able to successfully perform the task independently. After one round of game-play, students were instructed to use their personal activity worksheet cards for game-play. Students were given the opportunity to get real-time feedback on their personal habits from peers. This enhanced their learning experience in a meaningful way.

5.5.2 Feedback

"Having good habits" game was used as a consolidation exercise and a tool for formative assessment

of learners' understanding and retention of knowledge about that specific chapter. Surprisingly, all five ELS teachers had positive feedbacks about using this didactic games. They commented that integrating worksheets within didactic game itself, is an interesting, more meaningful and useful methodology for getting an instant feedback of the students' learning performance. This is a rewarding experience for teachers. Students (as players) controlled their own actions and decisions in the game. In games, making mistakes are handled in a sporting manner.

The Figure 35 (c) provides feedbacks through questionnaire-surveys of 103 P.4 students (Appendix C) on the game and worksheets:



Figure 35 (c): P.4 students' feedback on game-based experiment 2

For young children learning through trial and error is a part of everyday life (Kiryk, 2010). Games (like this) if based on familiar contexts, i.e. It should fit with an everyday task and the working environment can help to achieve optimum results (Pivec & Dziabenko, 2003).

5.6 Summary

All game-experiments for both P.4 and P.5 ELS classrooms were conducted in a sequencial order in flow with curiculum lesson structure. However, SWOT analysis approach was adopted for each game. Observational findings from one game also influenced the structure and design of gameplay for the next game. This approach can be summarized as shown below in Figure 36:

Six guiding questions	P.5		P.4		
	Experiment 1: Hong Kong on Wheels is based on Chapter 4 (two practices) of Longman Elect P.5B ELS curriculum textbook	Experiment 2: Police Stories is based on Chapter 5 (two practices) of Longman Elect P.5B ELS curriculum textbook	Experiment 1: How to be a Star Pupil? is based on Chapter 5 (two practices) of Longman Elect P.4B ELS curriculum textbook	Experiment 2: Having Good Habits is based on Chapter 6 (two practices) of Longman Elect P.4B ELS curriculum textbook	
What is the game?	Look and feel: Board game consisting of 2 colourful A3-size laminated paper, landscape format of two Hong Kong maps, 12 plastic pegs, 6 illustrative wooden dices and 24 laminated cards (12 question cards, 12 answer cards). Materials/textures/ finishes: Wooden dices Plastic pegs/markers Laminated paper Story/theme: Familiar context of Hong Kong - modes of transport, and calculating distances between landmark places	Look and feel: Board game consisting of 2 colourful A3-size paper, portrait format, with graphics of Sai Kung village house buildings with cut-outs and openable windows, 10 plastic pegs, 1 number dice. Materials/textures/ finishes: Plastic number dice Plastic pegs/markers Laminated paper Story/theme: Familiar context of Hong Kong's lifestyle chores and Sai Kung neighbourhood.	Look and feel: A2-size colourful, circular laminated board game consisting of 12 talk bubbles-shaped laminated cards, 1 colour dice. Materials/textures/ finishes: Coloured wooden dice Plastic pegs/markers Laminated paper Story/theme: Familiar context of Hong Kong students' roles and responsibilities as a star pupil	Look and feel: A3-size typical colourful, laminated board game consisting of 6 pegs, 6 activity cards, and 1 number dice. Materials/textures/ finishes: Plastic number dice Plastic pegs/markers Laminated paper Story/theme: Familiar context of Hong Kong students' daily chores involving good and bad habits.	
Where/how was it being played?	Co-operative play (Players compete as teams of 3-4) Spatial layout: Groups of 4 within classrooms	Individual play betwteen pairs Spatial Layout: Rows within classroom	Co-operative play (Players compete as teams of 4) Spatial Layout: Groups of 4 within classrooms	Individual play (Players within a group compete with each other) Spatial Layout: Groups of 4 within classrooms	
Who play the game?	All P.5 students (different abilities) under the guidance and supervision of an their ELS teacher and Teaching Assistant.		All P.4 students (different abilities) under the guidance and supervision of an their ELS teacher and Teaching Assistant.		

How to play	Camo procoduro:	Came procedure:	Came procedure:	Came procedure:	
the game?	Explained earlier in Pp. 82-85.	Explained earlier in Pp. 89-90.	Explained earlier in Pp. 93-94.	Explained earlier in Pp. 97-98.	
When was the	Plan and structure:		Plan and structure:	Plan and structure:	
game played?	An introductory powerpoint students undergo a warm-u	t helps teachers to let p session for 15-20 minutes.	No introductory powerpoint warm-up session. Teachers use their own understanding and style to explain the rules of play (10-15 minutes).	An introductory powerpoint helps teachers to let students undergo a warm-up session for 15-20 minutes.	
	fter explaining the rules of play, students engage in game-play (30-40 minutes) ost game-play, each student completes a worksheet for individual asessment (20 minutes) uration: 70-80 minutes (double lesson) iming: Each game experiment is conducted after each lesson is formally taught through chalk and talk approach				
Why?	Specific language focus and revision of vocabulary words within familiar contexts				
Learning outcomes	Team work, collaboration and competition Taking failures in a sporting manner, not afraid of making mistakes, confidence booster Enhancing all four language learning skills (Reading, writing, listening, and speaking)				
Strengths	Children enjoy contest and	randomness through dice orig	ented play		
	Multiple levels of difficulty Pictorial dices are more interesting and engaging Cooperative play enhances team spirit Includes multiple facets of learning - spatial knowledge and mathematics.	Active participation and sense of achievement is higher in individual play Each player gets his/her own separate board Good Information gap as information is not visible to the other player. Hence communication is more effective. Ideal for practising specific language focus and vocabulary words.	Cooperative play enhances team spirit Good match and learn technique. No information gap: Students within each group communicate with another by reading aloud the information on the card and matching it to the specific place on the circular board. Ideal for practising specific language focus and vocabulary words.	Active participation and sense of achievement is higher in individual play Each player gets his/her own separate, unique activity cards. Customization: A level of difficulty is created by allowing students to use their own worksheets based on personal experiences during second game-play. Good Information gap: Students get real-time feedback on their personal habits from their peers.	
Weaknesses	Having 6 dices creates confusion. Sharing game components makes certain groups sit idle and wait. For calculating longer distances, there is no guiding master sheet to tally answers.	No pre-defined levels of difficulty in game-play -			
Opportunities	Games must have an engaging look and feel. Simplify the manner in which the game handles levels of difficulty (reduce the number of dices)	Customization: Students must be given the freedom to select and arrange information on their own within the board game.		Incorporate story-telling and increasing the number of questions	
Threats	Cheating, being over noisy a	and mishandling/damaging g	ame components.		
	Lack of information gap: All information is freely visible to all players. Hence communication is redundant.	Students cannot engage in repetitive play as the game is highly predictable, limited and can be uninteresting.		-	

Figure 36: SWOT analysis of all four game-experiments

Interesting insights gathered from these four experiments are:

1) Games should be aesthetically attractive and engaging. Students are accustomed to routine, standard pedagogy based on the textbook pattern. Games can help break this monotony by adding in elements of surprise, novelty and change. Games should generate curiosity. They need to be innovative and immersive. The form (appearance) and function (usability) should appeal to the senses and captivate the player. The design 'form' includes graphics (colours, fonts, artwork); materials (textures, finishes); shapes; scale and tactile qualities (feel). The 'form' and "function" guide and steer 'emotion (experience)'. An imbalance between the two can result in apathy.

2) Game-play duration is based on allocated lesson time. The predefined lesson time needs to be considered before designing the game activity. How long should the game last? Do students want to engage in repetitive game-play? Teachers need adequate time for briefing rules of play, explaining worksheets, and learners to engage in repetitive game-play. The duration of the game-play must provide ample time for teachers to conduct pregame and post game activities (worksheets, tasks, Q&A sessions etc.).

3) Games should fit in the class size and structure. Games should compliment the specified classsize and structure within each classroom. For instance, in a class size of 30 students, designing a game for 4 players is futile. Here, game be designed for 2, 3, 5 or 6 players or as a whole class. Also, absence of students, disrupts standard group formations. The design of the games should have scope for such adjustments.

4) Games should have a clearly defined educational purpose and goal. By merely adding a game to a curriculum will not ensure effective learning. Games have to be carefully integrated into a curriculum wherein relevance lies in bridging appropriate game-play mechanics and rules with intended educational goals and objectives.

5) Games can be based on lessons, topics, or units as a whole. Children have a short attention span. Based on intended learning targets and students' abilities, teachers should gauge the amount of information that needs to be integrated within a game. The magic number seven (plus minus two) can be used as a key for structuring information within a game. Too much information can lead to confusion and anxiety. Whereas, too little information can cause apathy.

6) Games should be child proportionate and safe. The scale and materials should be childfriendly, easy to handle and use. The graphics (font-size, font-style, illustrations, colour) need to be legible and age-appropriate. Sharp corners in cards, pointed articles, hazardous materials should be avoided.

7) Its important to note, when are the games being played? A game should not be regarded as a marginal activity filling in odd moments (merely as short warm-up activities or when there is some time left at the end of a lesson) when the teacher and class have nothing better to do" (Lee, 1979; pp.3). Games as a core activity can be integrated at different time intervals during lessons. Educators can use games either as warm-up exercise, a part of the lesson itself or as a consolidation activity for assessment (as an exercise, exercise-task or task). Different games serve different purposes!

8) Games can be used as formative assessments. Games can be used as a tool for formative assessments wherein acquired knowledge or skills can be tested. Didactic games can be used as exercises, exercise-tasks, or elaborate task-based learning activities wherein players can only proceed when using specific language focus and vocabulary. Teachers can closely monitor students' performances and provide adequate guidance or support when required.

9) Rules of the game should be short, simple and legible. The teacher needs to explain and describe the rules of play to the whole class. Rules must be simple for students to decipher, remember and recall.

10) Games should facilitate active player participation. During group activities, students don't solely control, steer and guide their own actions. Their actions can be influenced by many internal and external factors - such as having a smarter, dominant peer; fear of making errors; reluctant to mingle or participate; having low self-esteem; lack of self-confidence or knowledge in a particular area. Games can help break these barriers. By providing opportunities to participate as individual players, games can help students to be individual players (or more active learners).

11) Games should have doable, incremental levels of challenges. Each student has his/her own configurations of strengths and weaknesses. Games must compliment and nurture this diversity by providing levels of difficulty (beginner to advanced levels). Often, learning materials are shared between teachers across different classrooms. Hence learning materials should fit in with the student's abilities but also provide scope for Zone for Proximal Development (ZPD).
12) ELS games should facilitate the development of all four-language skills - reading, listening, speaking, and writing. Games should provide frequent opportunities to students to be able to practice and refine these skills.

13) Games should have a familiar context. Students should be able to connect real-life experiences and acquired new knowledge in order to better understand its meaning. Familiar context (underlying story) help students to develop a comfort-level with the new knowledge and also enables them to process this information into their long-term memory.

14) Games should foster peer-interaction, collaborative play, and contest. Collaborative play helps students to work and function as a team (either in pairs or groups). Students learn from peers through sharing responsibilities and roles, language, imitation, self-corrections and interactions. It promotes a symbiotic relationship where they can learn from each other (Kiryk, 2010). Contest (as individuals, pairs or teams) helps create healthy competition and fosters intrinsic motivation.

15) Games should build on the player's personal experiences. Every child is unique. Games should provide instances where players can use and build on personal experiences. This nurtures their creativity and imagination. They gradually develop deeper understanding about the acquired, new knowledge and its implications in practical life. Consequently, it helps them mould and gauge themselves in comparison to their peers.

16) Games can be supported by introductory material. Introductory teaching materials (such as a power point) aids in shaping the learning process. Shaping involves breaking down of the task (lesson) into a series of steps and small approachable goals and therefore simplifying the task for the child (Tharp & Gallimore, 1988). This strategy is fruitful for teachers while explaining games rules and how to achieve learning goals.

17) Didactic games for classroom teaching as an educational kit. The design needs to have a holistic approach as a "tool-kit", wherein all components (including introductory power point DVD, multiple sets of the game, rules sheets, master copy of assessment worksheets) are stored safely and can be retrieved as when required. Didactic games for classroom-use, need to consist of multiple sets. Educators intend to use it as an educational resource material annually. Clear labelling on the packaging is mandatory.

18) Information or opinion gap: Language games require a need for players to communicate inorder to bridge the information gap and proceed further. Without a vital information gap, all communication is baseless.

19) Potential threats:

During play, **children often damage and mishandle the game components** in excitement or unknowingly. Lamination would help increase the life of the game.

Games can be noisy. In the act of being over zealous, students can be extremely loud and noisy. Teachers struggle to balance discipline with enjoyment.

Cheating during games. Every classroom consists of a few notorious students. They tend to cheat. Teachers need to conduct surveillance in order to minimize cheating. If the rules are violated the consequences must be enforced.

Chapter 6: Design framework for didactic games

Research findings and analysis are discussed, based on 208 (103 P.4 and 105 P.5) students' performance worksheets + questionnaires based surveys and individual semi-structured interviews of nine P.4 and P.5 ELS teachers. In cohesion with these, personal insights gathered from four game-based experiments have been translated and narrowed down to ten core factors/variables for designing didactic games. An empirical framework (based on these identified crucial factors) is proposed and discussed in detail. The aim of this framework is help educators understand "how to facilitate optimal teaching/learning experiences in ELS classrooms through didactic games". One didactic game is re-designed to provide evidence to support this framework in context to real life scenarios within Hong Kong Primary ELS classrooms.

"A recipe for a good educational game is one that balances both fun and challenge." (Steve Sugar, 1998; pp. xvi).

6.1 Research findings and analysis

6.1.1 P.4 and P.5 students' questionnaire survey

The Figure 37 (a) illustrates a three-dimensional graph on the feedback extracted from 103 P.4 students through questionnaire based survey (as shown in Appendix C), on two didactic games' experiments and their corresponding two worksheets.



Figure 37 (a): Graph of feedback extracted from 103 P.4 students

It is based on two primary facets - *challenge* (easy, average/OK, difficult) and *level of enjoyment* (boring, OK or fun). The mid-point on the graph depicts 'average' or 'OK' aspects to the two facets.

Similarly, Figure 37 (b) provides a three-dimensional graphical representation of the feedback derived from 105 P.5 students through questionnaire based survey, on two didactic games' experiments and their corresponding two worksheets.



Figure 37 (b): Graph of feedback extracted from 105 P.5 students

Based on both graphs, shaded "gray" zone (*challenge:* easy to OK; *enjoyment:* OK to fun) supports meaningful and enjoyable learning experiences. Favourable didactic games and assessment methods, must lie within this zone. Statistical feedback suggests that about 71% of P.4 and 79% of P.5 students are highly willing to learn through these didactic games. Here the term "OK" in context to challenge level wherein ZPD occurs (i.e. With an assistance of a more capable peer). Simultaneously,

"OK" in context to enjoyment depicts a neutral standpoint (neither fun, nor boring).

Almost 50% of both, P.4 and P.5 students agreed that playing such games helps improve their English. Furthermore, above 58% of P.4 and 55% of P.5 students believe that such didactic games helps them to understand the chapter well. About 57% of P.4 and 55% of P.5 students enjoy learning from the power point before playing the game.

6.1.2 Assessment of P.4 and P.5 students' worksheets

In Figures 38 (a) and (b), the graphical representations depict the assessment of learning outcomes from the worksheets for both, 103 P.4 and 105 P.5 students respectively.



Figure 38 (a): Graph of assessments from three worksheets of 103 P.4 students

Teachers clarified that the formative grading system for assessing worksheets is A (highest), A-, B+, B, B-, C+, and C (lowest). The hierarchical factors that influence this system include: appropriate language focus; correct grammar, punctuation, and spelling; clarity in expressing personal thoughts (creativity); adequate quantity of writing (completion of worksheet); and legibility (handwriting and neatness).



Figure 38 (b): Graph of assessments of two worksheets from 105 P.5 students

Astonishingly, the assessments revealed that both, P.4 and P.5 students from lower ability classes (sections C and D) performed equally well in their worksheets when compared to relatively higher ability students in sections A and B.

6.1.3 Semi-structured interviews of P.4 and P.5 ELS teachers

Language teachers in Hong Kong, are acknowledged to have heavy workloads, particularly in terms of marking (Storey et al., 1997). This often reduces the time available for lesson preparation. When time is scarce, traditional teaching or following the textbook may be preferred to preparing for task-based or game-based teaching (Lam, 2003). Similar issues were highlighted during semi-structured individual interviews conducted with nine P.4 and P.5 ELS teachers, each lasting a duration of 20-40 minutes.

On a shared perspective, they state that there is a constant pressure to complete the syllabus or textbook and this impacts on the time available to carry out tasks and games (Carless and Gordon, 1997). Ng (1994, pp. 82) sees this perceptual/actual pressure exerted from the school/parents of finishing the textbook on teachers, often results in lack of contemplation towards to quality of learning and nurturing diverse students' abilities. Cortazzi (1998) and Tong (1996) relate this deference to the textbook as a traditional Chinese viewpoint. However, teachers argue that this perspective cannot be taken as a mere excuse for not using/exploring didactic games. They suggest

that having these integrated within the curriculum itself would focus their time and effort in using, rather than designing didactic games.

The Figure 39 (a) provides a slice of semi-structured interview:

Researcher (me): "Hello, Ms... X /Mr... Y (ELS teacher). Since how long have you been teaching? And at STCPS? What are your comments on using the didactic games? What are your feelings towards the use of introductory power point as a pre-task cycle? Did you face any difficulties? Have you used games in classrooms earlier? What sorts of games, can you describe? Why did you discontinue using them? How do you think the students responded to this way of teaching/learning approach? Could you provide some suggestions for improvement? Would you like to adopt these in the next academic year? Which game do you think was the most effective and why? Is it difficult for you to manage and control students during such lessons? Do you think incorporating worksheet towards the end was a good idea? Why? Did you find it difficult or time consuming to assess these worksheets? Would this experience encourage you to use/design didactic games?" (July 11, 2013)

Figure 39 (a): A slice of semi-structured teacher's interview

The Figure 39 (b) provides a transcription of feedback from one of the most senior ELS teachers during her semi-structured interview:

Ms... X (*ELS* teacher): "The games have proved to be very effective in arousing student's interest in the subject matter. The attractive design is able to capture students' attention and interest. The well-designed games not only reinforce students' understanding but assist students in consolidating new sentence structures. The games are an excellent addition to the conventional 'chalk and talk' approach. They have enabled students to combine business (learning) with pleasure. However, these games and worksheets (both) need additional levels of difficulty to suit the diverse abilities of students. We should be given access and permission to use them every year as an educational resource. The power point presentation helps me in explaining game rules, conduct a live demonstration and plan the flow of lesson. The frequency of use of games in classroom depends on the number of lessons per week. We have to structure and plan our teaching based on them. I have only one double lesson per week. I prefer to use games in a double lesson so that children get

enough time to play and do their worksheets. Board games help students to work in pairs or groups (interact with other students), which is very important. Seeing students clearly understand the lesson content and enjoy their learning is a very satisfying experience." (1:30 p.m; July 11, 2013)

Figure 39 (b): Transcription of one semi-structured teacher interview

All nine teachers had positive attitudes towards using didactic games in classrooms. Attitudes are defined as "the interplay of feelings, beliefs and thoughts about actions" (Rusch & Perry, 1999; pp.291). Innovative didactic games should be compatible with both, the teachers' and students' attitudes towards teaching/learning, in order to avoid any kind of resistance for usage (Young & Lee, 1987). Didactic games helped students to open up by omitting shyness, and by providing an enjoyable, nonthreatening atmosphere for learning (Langran & Purcell, 1994). This is reflected in their performance, higher confidence level and motivation to learn. Follow-up assessments augment and consolidate the game by providing students the opportunity to reflect upon the game and acquired knowledge/skills and how it turned out (Langran & Purcell, 1994; pp.15-19).

Such didactic games can be considered as both, linguistic games (that enforce accuracy in writing and speaking), and communicative games (with an additional goal of fluency in communication) (Hadfield, 1999; pp.8). Hadfield (1990, pp.v) highlights that "Fluency is a vital practical skill, mandatory for effective communications in the real world, and in that sense, games provide a necessary connection between the classroom and the real world". Games make 'listening skills' more engaging, natural and less commanding. During game-play, students carefully and voluntarily listen and evaluate each others' communication.

6.2 Design of didactic games

6.2.1 Crucial factors for designing didactic games

During tasks (here didactic games) learners undergo a transition of varied roles - from active participants, to monitors, risk takers and eventually innovators by constantly learning and reflecting on their actions; creating messages and interpreting peer's messages (Richards & Rodgers, 2001). Simultaneously, the teacher is responsible for selecting, modifying and creating tasks and providing demonstrations on how to complete a task successfully to meet diverse learners' needs (Ibid). Hence,

the teacher embodies varied roles such as a facilitator, participant analyst, advisor and process manager (Hu, 2013). In agreement with Carless (2003), there are six crucial variables for planning and designing any activity for classroom use: 1) *Teacher attitudes and beliefs. 2) Teacher understanding of the activity. 3) Time available to carry out the activity. 4) Synchronization with the textbook/topic. 5) Adequate preparation and resourcing. 6) In sync with the language proficiency of students. However, the potential classroom implementation issues include: 1) Discipline and control. 2) Use of mother tongue. 3) Target language production and extended use (Carless; 2001b, 2002).*

The Figure 40 (below) depicts a hexagonal diagram of ten core factors (based on six questions: What? Why? How? Who? Where? When?) for designing of didactic games:



Figure 40: Factors for designing a didactic game

1) Aesthetics (what): Sensory and tactile aspects (look and feel) - Graphics, materials, textures, finishes, size, proportion, scale, type (fonts), colours, forms, etc.

2) Mechanics or process (how): Rules, procedures, levels, goals, feedback chance, contest, duration of play, no. of players.

3) Story (what): Familiar context (real or imaginary), role-play, theme

4) Goals or purpose (why): Information gap based on learning targets outlined within the curriculum objectives and content (topic/textbook). For language games, students communicate using specific language focus/vocabulary to bridge this information gap.

5) Technology (how): Game components and medium of interaction

6) Learners (who): Cognitive abilities, skills (capabilities), behaviour, psychology, age

7) Environment (where): Space, layout, infrastructure, class-size

8) Lesson (when): Plan, structure, duration

9) Assessments (why): How to evaluate performances during game-play and post game-play worksheets (learning outcomes and feedback)?

10) Teacher's (who): Individual pedagogical style; understanding (experience and expertise); attitudes and beliefs; confidence and comfort level (inclusion of additional supplementary tools to aid clarity and comfort in explaining and monitoring the task).

All these factors are equal, in terms of relative importance for designing didactic games. The holistic unification of these factors can result in players to *'have an experience'*. This *'an experience'* is separate and different from regular lived experiences. A game enables the experience, and is not the experience itself (de Freitas, 2006).

Dewey (1934, pp.206) describes,

Experience occurs continuously; but only some experiences are complete and unified. When "the material experienced has run its course to fulfilment", then we might say, "That was an experience". In such experiences, every successive part flows freely, without seam and without unfilled blanks, into what ensues.

'An experience' occurs when an individual undergoes something or some properties, these properties determine his or her doing something, and the process continues until the self and the object are mutually adapted, ending with felt harmony (Dewey, 1934). This sort of an experience is highly pleasure, memorable and unique. As a game designer and educational researcher, its a huge challenge and an ongoing concern for me to ensure that the design of "intended learning experience" is close or similar to the "undergone player experience".

6.2.2 Proposed empirical framework for didactic game design

In pursuit for this apprehension, Figure 41 provides an empirical model that facilitates having a meaningful learning experience through design of didactic games. It is based on Keller's (1987) ARCS Model on four lenses of motivation: *Attention (A), Relevance (R), Confidence (C), and Satisfaction (S).*

Within any classroom, teachers act as *facilitators* and introduce the game to their students. They need to grab student attention. The games must provide teachers with the opportunity to adapt to their individualistic pedagogical style. Some teachers are affluent to changes. Others, struggle with new, additional learning materials. Didactic games must consist of additional supplementary tools (details on introductory sessions) to aid clarity and comfort in explaining and monitoring the task for teachers. Every didactic game aims to increase motivation, engagement and performance through a meaningful, enjoyable learning experience. This *'experience'* can be filtered into multiple layers.

Didactic games should grab a student's *attention* and arouse curiosity by providing some sort of sensory or cognitive stimuli. Game design factors such as *aesthetics* and *technology* help create this stimuli. Curiosity often leads to exploration (Berlyne; 1960, 1967, 1971). This exploration should generate interest in the player to further play; else it can lead to apathy (disinterest) and eventually terminate the activity. During exploration, players encounter with the game's *story* and *mechanics*. Interesting didactic games need to be relevant. This *relevance* is extracted from familiar, optimal, age-appropriate contexts and defined textbook content, curriculum objectives and goals. Both, the game's story and mechanics need to be synchronized with the *lesson and learning environment* to facilitate player engagement and flow. Flow is a state wherein an (learner) player's high abilities (skills) are harmoniously balanced and synchronized with appropriate level of challenges faced by him/her while performing a task (Csikszentmihalyi, 1991).

The *learners* are the prime focus. Flow fosters their *confidence and satisfaction*. Learners (as players), must feel under control. Hence, the goals should be achievable and progressive (gradual increase in levels of difficulty). During flow, students undergo ZPD. During times of difficulties, they ask for assistance from more capable peers and teachers. If the game is too easy, it can lead to apathy; if it's too difficult, it can lead to player anxiety. In both scenarios, the player eventually terminates the activity. Flow often results in a pleasurable learning experience. This encourages learners to repeat



the game. This repetition refines and builds new skills, and in due course, leads towards mastery. This performance boost is reflected during post game-play assessments.

Assessments can be integrated as a part of the game activity itself or conducted towards the end. In context to language games, four language learning skills (reading, listening, speaking and writing) need to be used and evaluated. Hence, assessments should be approached as a holistic performance evaluation.

6.2.3 Implementation: Re-design of "Hong Kong on wheels" P.5 game

The game "Hong Kong on wheels" is re-designed and studied based on the identified crucial factors (as shown below in Figure 42) for use within P.5 ELS classrooms:

WHAT			
Aesthetics	Graphics: Child-appropriate (scale & proportion), vibrant colours, 2D simple illustrations Materials: Paperboard (board, cards); three wood pictorial dice, plastic markers Tactile factor		
Story	Players use various kinds of transport to visit tourist places in Hong Kong Has a real life, familiar context		
WHY			
Goals (Purpose)	Based on the two practices of ELS Primary curriculum 5(B) textbook Chapter 4		
	Vocabulary: Learning the different modes of transport.		
	Information gap: Communication occurs when players correctly use specific language focus:		
	Q1. How long (time) does it take from <u>(Place A)</u> to <u>(Place B)</u> by <u>(mode of transport)</u> ? A1. It takes hours andminutes. / It takesminutes.		
Assessments	Q2. How far (distance) is it take from <u>(Place A)</u> to <u>(Place B)</u> ? A2. It's a long way/ It's not far. It's kms.		
	Enhance numeric abilities (multiple addition) and spatial abilities (approx. locations of various places in Hong Kong)		
	Assessment grades are based on the following factors: Observed/recorded students' levels of participation and effective oral communication; performance in (post game- play) worksheets based on legibility (clear consistent handwriting) and effectiveness (vocabulary, grammar, punctuation, spelling) in writing skills. Teachers then discuss/reflect on problematic areas with entire class.		
HOW			

Technology	Game components & medium of interaction: 1 x double sided round game board (Hong Kong map); 12 x plastic markers Easy level: 12 x Q (grey cards) and 12 answer cards (4 pink, 4 yellow, 4 blue) Difficulty level: 8 x Q (red cards) and (use same answer cards) 3 x dices (1 x green, 1 x white, 1 x grey); 1 x distance calculator sheet		
Mechanics	<i>No. of players:</i> 3-4 players (in each group) <i>Rules & Procedures:</i>		
	<i>Practice 1:</i> Each group receives a set of game components. Each player randomly selects 3 answer cards each. The bundle of 12 Q cards is placed in the centre. Players take turns to pick up a Q card. Player A picks up a Q card and asks the question to his/her peers using the language focus - "How long does it take to travel from to by (chooses a mode of transport)?" After listening to the question, the students look for the appropriate card. Player C has the corresponding answer card. He/she answers using language focus - "It takes minutes / hour(s) and minutes." If the answer is correct, Player C puts a "marker" on "to location" on the map. Now Player C picks up the next Q card and asks another question. After listening to the question, the students look for the appropriate card. Player B has the corresponding answer card. He/she answers using the language focus - "It takes minutes / hour(s) and minutes." If the answer is incorrect, Player B puts the Q card back into the bottom of the pile and he/she cannot put a "marker" on the map. Player C picks up a new question card. The 1st team to finish all the places on the map (or puts 12 markers on the map) wins!		
	<i>Practice 2:</i> Each group receives the Hong Kong map and 3 dices (of three different colours: white, grey, green): Student A rolls the two dices. Based the 2 places shown on the 2 dices, student asks the question using the language focus -"How far is it from to?" to his/her group. After listening to the question, the students look for answer (calculate the distance) on the Hong Kong map. Student B tells the answer using the language focus - "It's not far. / It's a long way. It'skilometers." If the answer is correct, the student puts a "marker" on that place on the map. Now Student B rolls both dices together and asks another question. Student C answers the question. If the answer is incorrect, Student C cannot place the marker on the map. Student B rolls the two dices again. When a Student rolls both the dices, and the places shown on the dices already have a marker on the map, he/she misses a turn. The 1st team to finish all 6 places on the map (or puts markers on all 6 places on the map) WINS!		
	<i>Levels of difficulty:</i> Both parts of the game have two levels of difficulty each, based on selection of cards (in practice 1) and dices (in practice 2).		
	For instance, through the selection of red "Q" cards, students calculate (sum up using two different answer cards) longer time values for a specific mode of transport.		
	Similarly, in practice 2, when selection includes (green + white)/(gray + white) dices, then the game is at an easy level. If (green + gray) dices are selected, the game becomes difficult as students need to calculate (sum up) longer distances on Hong Kong map.		

	Goals:Effective use of language focus during oral communication (sentence structures, pronunciation, fluency)Correct mathematical calculationsEnhance teamwork, confidence; reduce the fear of embarrasment of making mistakes 1st team to finish (agile, quick, alertness)Feedback:Students get immediate feedback and assistance (ZPD) from their peers during communications. Also the distance calculator helps them to cross-check their answers.Chance:Randomness created through dice-oriented play Contest:Cooperative parallel play (students form teams to compete with one another)Duration of plane 20, 20 minutes	
WHO		
Learners	Based on their cognitive abilities and skills (capabilities), the game and worksheets, both have levels of difficulty. It helps students to reflect on their individual learning through ability-paced worksheets and indulge in interactive behaviour. Psychological aspects such as a sense of achievement, confidence in learning and pleasure are nurtured during gameplay. The game is age-specific as its design is based on the intended curriculum.	
Facilitator	A clear, defined linear connection between the game's structure with the educational targets, makes it highly suitable for classroom use. It is cohesive to teacher's pedagogical style; understanding (experience and expertise) and attitudes and beliefs. Teacher are provided with an additional supplementary tools - a pre-task power point session (to aid clarity and comfort in explaining and monitoring the task) and a post-task worksheets (to help evaluate and consolidate immediate learning outcomes of the diverse learners).	
WHERE		
Environment (safe, controlled)	The game is based on the group-work spatial layout of P.4 and P.5 ELS classroom space. The number of players in each group are in accordance to the class-size. Considering the availability of IT infrastructure within the classroom space, the power point presentation was designed and restructured.	
WHEN		
Lesson	 Plan and structure: It is based on the cohesion of P-P-P pattern with TBL (task based learning). Duration: This activity is designed keeping the double lesson (70-80 minutes) in mind. The time allocation suggestion for this entire activity is as follows: 1) Present (Pre-task introduction and briefing session 10-20 minutes) 2) Practice (Game-play task 20-30 minutes) 3) Produce (Worksheet session 20-30 minutes) 	

Figure 42: Hong Kong on wheels game redesign based on crucial factors framework

The Figure 43 provides snapshot of the re-designed game itself.



Chapter 7: Conclusion

This final chapter concludes the entire research process. It draws light on the significant contributions of this study, limitations, scope, position and future work.

7.1 Summary of the study

This research study reviewed relevant theoretical studies conducted on learning, play, didactic games, flow (engagement) and education. In the quest to identify crucial factors for designing a didactic game, particularly for classroom use, a comprehensive investigation based on participant observations and first-hand, multiple experimentations within the naturalistic settings was adopted as the central premise for this study. This empirical approach towards the study, aided in mapping out the limitations and scope for using didactic games within the given context. Incorporation of various methodologies of mixed methods research, helped manoeuvre the design and implementation of four didactic game experiments.

Grounded in the contextual understanding of defined curriculum goals, pedagogical patterns, diverse students behaviours, lesson structures and problems persistent to language learning, the design of these game experiments helped in gaining deeper, clearer and unadulterated insights. The gathered insights based on students' performances and teachers' feedbacks during ELS lessons proved substantial for defining crucial factors for designing didactic games. These factors have been translated into an empirical framework on how to provide meaningful, enjoyable learning or 'an experience' through didactic games in classrooms. This empirical framework suggests an informed and rigorous reflection on the intended cycle of learning by adopting didactic games.

This study is situated within the real-life context of Hong Kong ELS P.4 and P.5 classrooms. This is used as a practical example for conducting research and analysis. In the era of surplus use of digital gadgets, this research emphasizes on using tangible didactic games to help revive, explore the true potential of learning from and with peers through face-to-face interactions within classrooms. Didactic games engage a child's multiple senses and facilitate learning through peer communication by hands-on means. From the teacher's perspective, teaching through didactic games can be a interesting, intrinsically motivating, learning and a rewarding experience for the self.

In agreement with Lewis (1999),

Through games children experiment, discover, and interact with their environment. For many children between ages 4-12, language learning will not be the key motivational

factor. Games can provide this stimulus. The game context brings English language to life (immediately useful) for children. The game makes the reasons for speaking plausible even to reluctant and shy children. Through playing games, students can learn a lot as it creates a stress-free anxiety-free, fun-filled and competitive learning environment.

Towards the end, the re-design of one didactic game provides empirical evidence on how educators can use the eight identified factors along with the empirical framework to design innovative didactic games, to develop a positive-motivational attitude towards learning, and enhance performance during classrooms.

7.2 Significance and Contribution

A significant amount of past researches on educational (language) games largely emphasize on the importance of using games in classrooms. These relate to various developmental theories and positive cognitive psychology highlighting the benefits of play on learning. Within these studies, the referenced games are quite generic and universal. They mostly comprise of word-bingos, crosswords, word based chutes and ladders, word based tic tac toe, whisper circles, dominos (making pairs) etc.

Apart from these, Scrabble family of words games are the only English games that are adopted within classrooms as 'fillers' for vocabulary building. In accordance to understand what goes into designing Scrabble word games, I conducted a complimentary/extended study on 'understanding gameness within the Scrabble family of English word games' (attached as Appendix D).

Therefore, it is clear that finding authentic, contextual language games for study and evaluation are rare. Hence, I adopted the exploratory experimentation technique. My research builds on new, self-designed, game-based experiments within the context of Hong Kong P.4 and P.5 ELS curriculum. These rich, authentic pedagogical examples (in terms of didactic game design) aims to inspire educators and game designers to understand and create their own authentic didactic games for classrooms. They also act as a valuable pedagogical resource for other schools in Hong Kong (using the same curriculum) to experiment in their classrooms.

Educators, game designers and educational researchers constantly face the challenge to build (design) learning environments where the dynamics of learning are fully integrated with the dynamics of game-play (Paras & Bizzocchi; 2005). My research has constructed two frameworks: 'what are the key factors for didactic game design' and 'how and to solve this problem' as a cohesive solution.

For practising game designers and design students, adopting these two frameworks would provide them with core essential ingredients for carefully describing a problem; for conducting systematic inquiry and consequently, adopting adequate actions towards didactic game design. These two frameworks are centred around the ideology that user (learner) experience lies at the heart of design. The intertwined relationships between the proposed ten factors can help weave authentic learner experiences. This approach provides a comprehensive attitude to understand and improve user experience through 'design' in a more intricate and holistic manner. The underlying structure of 'intended learning cycle through didactic games' adds a fresh and lucid overview for designers to articulate intended learning experiences, generated from their designed didactic games. For educational researchers, these simple, legible frameworks act as valuable knowledge to approach, understand, and study current accessible games and eventually design their own didactic games.

This study examined didactic games as an amalgamation of two approaches (P-P-P and TBL) from three perspectives: the creator (designer), the users (learner) and the facilitator (teachers). Didactic games as P-P-P helps students to *focus on form* through repetitive practice of specific language focus, grammar structures and vocabulary words in both, written and oral communications (Ellis, 2009). Didactic games as TBL helps students to *focus on meaning* with some sort of 'information gap, information transfer or opinion gap' so that learners can engage in communication based on linguistic and non linguistic resources (Finch, 1999). However, the fourth perspective of the publisher as official scope for marketing and business was momentarily ignored.

7.3 Limitations and scope

Due to the limitations of time, resources and accessibility, this research focussed on a detailed study of *didactic game design* within defined context of Hong Kong ELS classrooms. With a focus on nine P.4 and P.5 ELS classrooms, the sample size was relatively small scaled. In order to achieve sufficient insights, I investigated nine classrooms over a tenure of one academic year and conducted eight

diverse game experiments. Five (one preliminary and four main) out of these eight are elaborated in this research.

The designed didactic games (as a pedagogical resource) are highly significant and limited in usage, to schools following the similar curriculum. The content of some of these games are highly contextual. However, to make them relevant in other cultural contexts, the game-story and mechanics need to be adjusted. For instance, instead of using the map of Hong Kong, the reference can be translated to any other geographical familiar contexts (Shanghai, Tokyo, London, Mumbai, etc.).

Despite outlining the factors for designing didactic games, educators (teachers) may struggle on how to create aesthetically engaging (professional looking) didactic games for classroom use. Their lack of aesthetic abilities may affect their confidence about the overall look and feel of the game. However, its vital to understand that aesthetics is only one aspect of the game. This study aims motivate teachers to try and translate their teaching experiences and ideas into simple doit-yourself (DIY) tools (games), which they can test within their classrooms. Generous efforts may result in a polished game product. In such a scenario, teachers and game designers can work in collaboration to develop exciting didactic games that are not only profound aesthetically but also are effective teaching /learning tools.

Furthermore, educators may perceive this act of planning and making their own didactic games as highly skilled and time-consuming task. This research stems on the empirical evidence that it is highly rewarding for teachers and game designers to see learners undergo an enjoyable and meaningful learning experience and is reflected in their higher academic performances.

Researchers can use and test the relevance and transferability of proposed empirical framework and factors for designing didactic games (identified in this research) in varied subject classrooms, for different age-group learners across diverse medias. This study was approached from educational and experiential learning angle within the 'present day context' of Hong Kong classrooms.

However, formal investigations from historical, cultural and ethnographic inclinations would be highly beneficial in realizing the kinds of play which have existed for generations within these ethnic communities.

7.4 Position and future works

Using this research as a substantial starting point, there is a vast scope to conduct further empirical studies across diverse Hong Kong schools and explore various other sociocultural contexts; languages and subject areas in education. The options are limitless. The intention of this research is to motivate educators to design their own didactic games (based on the empirical model) especially in relatively naive and underprivileged educational societies.

Some interesting future works can include:

- 1) Empirical studies on designing didactic games in (specific subject) education
- 2) Studies on didactic toys and games from anthropological and historical perspectives
- 3) Content analysis of preschool toys/ didactic games (specified time to present)

In the ongoing efforts of colliding digital simulations with learning and games, children are now accustomed to playing with touch-screen devices. The conveniences of indulging in solitary, independent, self-paced digital play and massive multi- player online role-play games (MMORPG), has resulted in a high degree of addiction to playing in the artificial worlds. The charm of face-to-face interactions with players enabling real-time communications and tactile sensations has been over-shadowed. Classrooms are rich environments wherein students have easy physical access to their peers. Simple tangible didactic games can nurture rewarding learning experiences through real-time personal communications in game-play. More research studies need to be carried out in the field of tangible games (for recreational and educational purposes), in order to keep this tradition alive.

The Figure 44 defines the position of this research within the realm of learning (education) and game design.



Figure 44: Position of this research

Education acts as the building blocks for life. Children need to experience education with enthusiasm. The learning environment significantly influences and moulds a child's socio- cultural construct of the Self. Children desire to enjoy and be an active part of their learning process. Classrooms need to be more symbiotic and collaborative social environments that can foster holistic development of both, students and teachers.

Didactic (tangible) games are just one aspect to learner-centred education. They truly are valuable artefacts of 'design and knowledge acquired' within evolving human societies. This study is among the very few to bridge significant theoretical and empirical point-of-views to understand and describe design of didactic games. Throughout history, play and games have been a way of life and influenced many cultures.

This study is devoted to exploring design as a value addition, in the lives of children. The focus is extended from being a means of recreation to learning, goal-oriented play and experience-based education within the special context of classroom environments.

APPENDICES

A: Child development and psychology

B: Hong Kong education system

C: P.4 and P.5 students' questionnaire-based survey

D: Understanding 'gameness' within the SCRABBLE[®] family of English word games.

APPENDIX A

Child development and psychology

The developmental patterns in children and adolescents are studied from the following, theoretical perspectives (Figure A1) (McDevitt, Ormrod; 2007):

THEORETICAL PERSPECTIVES	EMPHASES OF PERSPECTIVES		
Maturational	The development of many physical abilities depends on the genetically controlled unfolding of physiological and neurological structures.		
Psychodynamic	Children and adolescents experience impulses through sexuality, aggression, desires for social approval and the urge to social productive contribution.		
Cognitive Developmental	Children and adolescents actively contribute to their own intellectual development. By discovering difficulties or contradictions in their own thinking, they formulate new ways of understanding the world. With development, intellectual operations get increasingly complex, abstract and systematic.		
Behavioural Learning	Children and adolescents learn a great deal from observing others. Based on their observation, they also learn to regulate their own behaviour in order to achieve successful intended outcomes.		
Evolutionary	Characteristics and behaviours, which enhance an individual's probabilities for survival and reproduction, may have genetic basis.		
Information Processing	The ways in which children perceive, interpret and remember information change over time. With age, children become increasingl aware of and able to control their own cognitive processes.		
Ecological and Socio- historic	The communities and cultures in which children live have a significant influence on their learning and development.		
Life-span	Developmental changes occur in humans from conception to dea Some of these changes are predictable and age-related. Others re from specific historic events and individual life events.		

Figure A1: Theoretical Perspectives of Child Development (McDevitt, Ormrod; 2007)

Researchers commonly classify and organize development in terms of periods: newborn (ages 0–1 month); infant (ages 1 month – 1 year); toddler (ages 2–4 years); preschooler (ages 4–6 years); school-aged (ages 6–11 years) and adolescent (ages 11–18) (Kail, 2006).

I) Biological (physical) development

Development of the brain and nervous system is an important aspect of physical development. The number and size of the brain's nerve endings gradually increase through myelination.

Myelination is a process in which an insulating layer of fat cells covers many brain cells and nerve cells, thus resulting in faster transmission of information throughout the nervous system (Santrock et al, 2010). Myelination in the areas of the brain related to hand–eye coordination is completed at about the age of four (Santrock et al, 2010). Myelination in brain areas related to focusing attention is completed at the end of the elementary-school years (Case, 1992a, 1999; Tanner, 1978). Hence, children have longer periods of low attention during early childhood, but it gradually improvises during school years (Santrock et al, 2010).

From the age of 6, children tend to gain greater control over their bodies. Their gross motor skills and fine motor skills develop, smoothen, coordinate and refine extensively. Gross motor skills involve large-muscle movements, such as running and sports. Fine motor skills involve finely tuned movements, more control and skill, such as refinement in a child's handwriting, arts and crafts.

II) Socio-emotional development

The American Oxford English dictionary (2012) defines emotion as a very instinctive and intense feeling, based on physical and mental responses. Emotions are broadly classified into primary emotions (such as surprise, joy, anger, sadness, fear and disgust) and self-conscious emotions (such as empathy, jealousy and embarrassment). Often, emotions elicit expressive, goal oriented and adaptive behaviours and are largely influenced by gender, culture, and society.

Emotional intelligence is the ability to perceive, express and manage emotions (Mayer, DiPaolo & Salovey; 1990). Goleman (1997, 2006) and Doty (2001) categorize emotional intelligence into five dimensions (Figure A2):

DIMENSIONS	DESCRIPTION	
Emotional understanding	The ability to differentiate and interpret one's own emotions and the emotions of others. Often linked to self-awareness & greater self-confidence.	
Responding to other's emotions (empathy)	The ability to experience and understand the feelings, situation and motives of others. We respond to other's emotions through verbal language, para linguistic cues (tone, pitch, or attitude), facial expressions, gestures or body language.	
Emotional regulation	Elias et al. (1997), define emotional regulation as the ability to tolerate and manage emotions. Children often use social referencing (interpreting a situation and deciding how to respond by using others' reactions as a strategy). Emotional regulation helps students to manage stress, and focus on a task for attaining productive results.	
Self- motivation	Goleman (1995) defines self-motivation as the ability to generate feelings of zeal, confidence and persistence, especially during challenges and feedbacks.	
Emotions in relationships	 Process of initiating, building and maintaining social relationships. Positive, supportive peer relationships result in greater social adjustments and academic success (Zins, Bloodworth, Weissberg & Walberg; 2004). 	

Figure A2: Five Dimensions of Emotional Intelligence (Goleman, 1995, 2006; Doty, 2001)

Every childhood has two social worlds: adult-child relationships and peer relationships. Adult-child relationship is highly significant during the early years of child development and is closely associated with attachment. Holmes (1993) defines attachment as an affectionate tie-up with a differentiated, preferred, conceived as stronger and wiser individual or caregiver. Peer-interactions nurture, influence and develop a child's thoughts, beliefs, actions, knowledge and skills (Scrimsher & Tudge, 2003). Children solicit for mutual trust, guidance, emotional support and companionship from their peers. Good peer relationships facilitate socialization, the sense of identity and friendship (Berndt & Ladd; 1989).

According to the New Oxford American English dictionary (2012), the word *peer* originates from Middle English: from Old French *peer*, from Latin *par* meaning 'equal', and refers to a group of people of approximately the same age, status/position or interests within a sociocultural context.

Using socio- metric techniques, children are classified in the following categories based on social status among their peers (Wentzel, & Asher, 1995):

1. *Popular:* They can have attractive physical appearances, intelligence, social competence, well-regulated emotions and high peer acceptance.

2. Controversial: Many peers either like or dislike controversial children, as they tend to possess leadership qualities, but are also prone to aggressive behaviour like bullying and fights.

3. *Rejected:* They are rarely liked and often disliked by peers. They have high aggressive behaviours, submissiveness, socially isolated and are often oversensitive to teasing. Due to low peer acceptance, rejected children tend to possess low self-confidence, low self esteem and are academically weak.

4. Neglected: They are often isolated and seem invisible to their peers. They are neither liked nor disliked by their peers. Characteristics such as good social skills, non-aggression, and shyness are found in such children.

5. Average: They lie in the middle of liked and disliked scales of peer acceptance.

Peer collaboration, peer-evaluation and peer-acceptance significantly influence and mould the child's perception of the Development of the Self (Raviv, 1996; Harter, 2006). Thus, the development of the Self is a socio- cognitive (Harter, 2006), a cultural (Wang, Shao & Li, 2010) and an emotional construct and is perceived from three aspects (Blasi-Taylor, 2002):

1. Self-concept is a set of attributes, abilities, attitudes or values that define what the individual perceives of him/herself (Berk, 2009). This multi- dimensional construct involves both, academic and social aspects (Byrne, 1996); and is a function of age (Harter, 1999).

2. Self-Esteem includes judgments that individuals make about their worth and the feelings associated with those judgments (Berk, 2009). It determines the extent to which an individual perceives himself/herself as capable, significant, successful and worthy (ibid). High self-esteem often results in positive adjustments and mental health, whereas, low self-esteem is associated with poor adjustments and emotional disorders (Harter, 2006).

3. Self-efficacy is an individual's perception about his/her own capabilities for learning or doing activates at a designated challenge level (Bandura, 1997). A student exerts effort when he/she believes that despite a few setbacks, the task can be performed well (Pajares, 1996). When challenges are high and the setbacks are strong, either students begin to doubt their own abilities and

tend to put in less effort or are more likely to give up (Pajares, 1996).

Educators must foster emotional support, positive peer relationships and motivation during childhood to avoid emotional disturbances such as depression, anxiety, severe aggression, that can adversely affect their academic performances. Classroom instructions must provide recurrent opportunities for nurturing development of the Self, from/through positive peer interactions. This can be achieved through dialogic teaching/learning.

Alexander (2008, pp.22) defines

Dialogic teaching is intended to promote a community of inquiry where learning is not a one-way linear communication but a reciprocal process in which ideas are bounced back and forth. It involves the following criteria: 1) Collective: Teachers & children conduct learning tasks together, as a class or a group. 2) Reciprocal: Both mutually share ideas and consider alternative viewpoints. 3) Supportive: Students can freely articulate ideas without hesitation or embarrassment of making mistakes and failure. 4) Cumulative: Building together on personal and or shared ideas to facilitate coherent thinking and enquiry. 5) Purposeful: Teachers plan and steer classroom conversations based on intended learning goals.

III) Cognitive development

Cognitive development involves growth and development in the mental processes such as thinking, perception, memory, information processing and language. This section provides a comparative study between children and adolescents' developmental cognitive constructivist theories - Piaget's cognitive constructivist theory, Vygotsky's social constructivist theory and Case's cognitive and social constructivist theory.

A) Piaget's Theory: Cognitive constructivist

For Piaget (1952), cognitive development occurs in a sequence of four, age-related, discontinuous stages called sensorimotor, preoperational, concrete operational, and formal operational; wherein each stage consists of distinctive ways of thinking.

The sensorimotor stage is from ages 0-2 years. Infants understand the world by coordinating sensory experiences (seeing and hearing) with motor actions (reaching, touching). They commence with early reflexes and random movements. As they gain more control over their muscles, they tend to elaborate them into voluntary actions. By the end of this stage, they display far more complex sensorimotor patterns. Piaget (1952) believed that during the sensorimotor stage, infants achieve object permanence or an understanding that objects and events continue to exist even when they cannot be seen, heard, or touched.

The preoperational stage is from 2-7 years of age. Children begin to understand and use symbols to represent objects, actions, people or places that are not present. This symbolic function (between ages 2-4) takes the form of language, drawing or pretend-play. Children (between ages 4-7) gradually develop intuitive thought. This prelogical thought is characterized by the inability to clearly distinguish fantasy and dreams from reality. They randomly link a series of unrelated and unconnected ideas into a whole, in attempt to find explanations. This is called as syncretism. At times, children merge two or more ideas or events without knowing the logical concerns for cause or effect. This is called as juxtaposition.

Although, children are acquainted with numbers, colours and shapes, they cannot conduct operations yet. Operation is a term for basic, logical mental manipulations of information. Children attain centration or the ability to only focus attention on one characteristic or aspect of an object, rather than all of them. Piaget (1952) argues that there are two important limitations or preoperational thinking: egocentrism and animism. Egocentrism is the inability to distinguish between one's own perspective and someone else's perspective. Animism is the belief that inanimate objects have "lifelike" qualities and are capable of action.

The concrete-operational stage is from 7-11 years of age. Concrete operational thought is logical, rule-bound and integrated. An operation can be defined as a mental activity that transforms or manipulates information for

some purpose and is the foundation for organized thinking (Piaget, Inhelder; 1969). The term concrete refers to the fact that, children in this stage can only reason about tangible objects. There are four main aspects to concrete operational thinking:

Classification: Classification is defined as sorting of objects into groups based on a common criterion.

Class Inclusion: Children recognize class inclusion as, if a general class of objects can be broken down into two or more sub-classes, the number of objects in the general class must be larger than the number of objects in any sub-class. For instance, a child is shown a picture consisting of ten animals - six dogs and four cats (as shown below in Figure A3).



He asked the question, "Are there more dogs or more animals?" A child identifies that dogs is a sub-class of animals. He observes that there are 6 dogs and 10 animals. He answers, "There are more animals than dogs".

Transitivity: It involves the ability to logically combine relations to understand certain conclusions. In the above example (Figure A1), there are 10 animals, 6 dogs, and 4 cats. The child understands that if 10 animals > 6 dogs, and 6 dogs > 4 cats, hence, 10 animals > 4 cats.

Conservation: In 1969, Piaget and Inhelder conducted traditional experiments to study conservation with children (ages 7-11). Under all given circumstances

(in Figure A4), a conserving child recognizes that objects have same number, length, quantity, mass, area, weight or volume despite altering their physical appearance.



Figure A4: Conservation experiments (Piaget & Inhelder, 1969)

Seriation: It involves creating order among the stimuli based on one or more quantitative aspect. Simple seriation is the ability to arrange a number of similar objects in a series based on one quantified, common criterion. Multiple seriation is the ability to arrange a number of similar objects in a series based to two or more quantified, common criteria. For instance, within a classroom, singular seriation can be based on gender (as boys and girls), whereas multiple seriation can be based either on gender, first names in alphabetical order or height.

The formal-operational stage is from 11-14 years of age. At this stage, adolescents develop hypothetical-deductive reasoning through logical and

abstract thinking. They perceive and evaluate all possibilities in order to solve a problem or reach conclusions. They also develop a sense of egocentrism (Elkind, 1978). Adolescent egocentrism is the heightened self-consciousness wherein adolescents believe that others admire their personality or behaviour. This often leads to the desire of being popular, unique and they have a strong affinity for independence and freedom.

Piaget's theory is widely practiced to study how students process information through attention, memory, and using effective strategies for design of pedagogy (Case, 1987, 1997, 1998). However, some research studies disagree with Piaget regarding the stage-like cognitive development of children (Bjorklund, 2000; Case, 1998, 1999, 2000). Many studies highlight more cognitive competencies of young children and more cognitive shortcomings of adolescents (Flavell, Miller, & Miller, 1993; Wertsch, 2000). The conservation of number has been demonstrated by children as early as at the age of three (during preoperational stage); whereas many adolescents are still thinking in terms of concrete operations rather than abstract thinking (Ibid).

B) Vygotsky's Theory: Social constructivist

Vygotsky (1978) viewed that learning is a sociocultural construct which, primarily occurs through social interactions and use of language. He (1935, 1978) coined the term Zone of Proximal Development (ZPD).



The Figure A5 mentioned below, is a representational model of Vygotsky's theory of ZPD:

Figure A5: Zone of Proximal Development (Vygotsky; 1935, 1978)

ZPD defines the range of tasks that are too difficult for children to master alone but that

can be learned under the guidance and assistance of adults or more capable peers. Thus, the lower limit of the ZPD is the level of problem solving reached by the child working independently. The upper limit is the level of additional responsibility the child can accept with the assistance of an able instructor or more capable peers. Thus, ZPD involves learning through the gradual maturation of cognitive skills and increase in a child's performance level (Panofsky, 2003). The ZPD is closely linked with the concept of scaffolding. Scaffolding is a technique wherein a more-skilled person (a teacher or a more-advanced peer of the child) adjusts the amount of guidance and support to fit the student's current performance level.

Vygotsky (1978) states that a classroom (representing a larger social group) acts as a vital agent for influencing a child. Every function in the child's cultural development appears twice: first, on the social level (between people or inter-psychological), and then, on the individual level (within the child or intra-psychological). He challenged Piaget's ideas on language and thought. Young children use language not only for social communication but also to plan, guide, and monitor their own behaviour. He (1962) believed that language and thought initially develop independently of each other and then gradually merge. Children aged 3-7 tend to participate in verbal self-talk. Gradually, the verbal form of self-talk is lost and transforms into private speech (inner speech). It is this inner speech that later becomes their thoughts.

C) Case's Neo-Piagetian Theory: Cognitive-social constructivist

Case's theory characterizes development as a progression through four major stages.

At the sensorimotor stage (0–11/2 years), children understand the world through sensory experiences particularly involving touch. They mainly focus on cause and effect, such as the dropping of a spoon and the resulting noise (Case, 1992a).

At the inter-relational stage (11/2–5 years), children's mental representation consists of objects, people, and actions. Their thinking is still dominated by relationships between cause and effect.

Children in the dimensional stage (5–11 years), can focus on multiple dimensions simultaneously, and they begin to clearly distinguish between these operations. Their mental representations involve relational categories and comparisons.

At the vectorial stage (11–19 years), individuals can operate abstract concepts with logical reasoning.

The above three theories are summarized in Figure A6.







TOPIC	PIAGET	CASE	VYGOTSKY
Constructivism	Cognitive constructivist	Cognitive and social constructivist	Social constructivist
Stages	Strong emphasis on stages (sensorimotor, preoperational, concrete operational, and formal operational)	Emphasis on stages (sensorimotor, interrelational, dimensional, and vectorial)	No general stages of development proposed
Key processes	Schema, assimilation, accommodation, operations, conservation, classification, hypothetical-deductive reasoning	Working memory, myelination, automatization through practice, and central conceptual structures	Zone of proximal development, language, dialogue, tools of the culture
Role of language	Minimal; cognition primarily directs language	Language plays a central role in the development of strategies	Major; language plays a powerful role in shaping thought
View on education	Education merely refines the child's cognitive skills that already have emerged	Education plays a critical role in the transmission of knowledge from one generation to the next	Education plays a central role, helping children learn the tools of the culture
Teaching implications	Also views the teacher as a facilitator and guide, not a director; provide support for children to explore their world and discover knowledge	The teacher guides students' learning by providing instruction that is a good fit with their working memory capacity and capabilities	The teacher is a facilitator and guide, not a director; establish many opportunities for students to learn with the teacher and more-skilled peers

Figure A6: Three-constructivist cognitive developmental theories (Santrock et al, 2010)

Piaget believed that children actively construct knowledge by transforming, organizing, and reorganizing previous knowledge, whereas for Vygotsky, students actively construct
knowledge through social interactions with others (Kozulin, 1990). Case argued that children's developmental progression across various stages is a function of social interactions, language and more efficient use of working memory, which provides them with a greater ability to process more complex information (Santrock et al, 2010).

IV) Working memory and information processing

Information in communication theory relates to entropy and is defined as a measure of one's freedom of choice (randomness, uncertainty) when one selects a message (Shannon, 1948). On a shared perspective, high information and low information denotes a large quantitative increase and decrease in a message. This need not always be true. In communication theory, high information or low information can also signify high or low degree of (entropy) randomness/uncertainty in the same message (Ibid).

Memory is conceived as successive storing of information in steps or stages and is categorized as sensory memory, short-term memory (working memory) and long-term memory (Clarke & Koch, 1983). The senses send impressions (through sight, hearing, touch, taste and smell) into the sensory memory. From these sensory impressions, the mind reviews and selects what to notice and what to put into the short-term memory through the process of encoding.

Encoding involves the following strategies: 1) Rehearsal: Repetition of information through practice or drill. 2) Organization: Connecting new information to prior knowledge by grouping or creating hierarchies. 3) Elaboration involves adding to new information by creating a link between two or more items and remembering them as a set. E.g. Rhymes help in keeping the whole sentences in memory. 4) Visual imagery: photographs, illustrations, maps, charts, and graphs. 5) Meaningful learning involves how an individual puts the acquired information in his/her own words/style by blending in real-life personal experiences.

The tricks that help to recall the stored information back out of long term-memory are called retrieval strategies. They include: 1) Visualization: Retracing mentally formed images of relevant steps, places or events. 2) Inference: Systematically working through what preceded the lost bit of memory. 3) Perseverance: Concentrating all attention in order to

bring information back to mind, when necessary.

Miller (1956) argues that a human's maximum capacity of working memory is (based on magic number seven plus minus two), i.e. 5-9 pieces or bits of information. Bits, a term (frequently used in computing), means a choice between two options. When dealing with high information, chunking (or grouping) and encoding strategies are often most reliable.

In Figure A7, Clarke & Koch (1983) provide a representational model of human information processing.



Figure A7: Human Information Processing Model (Clarke & Koch, 1983)

APPENDIX B

Hong Kong education system

Background

Going back in history, Hong Kong was a British colony from 1841-1997. During the colonial rule, education system was highly examination-oriented. Standardized tests were conducted across all schools in order to advance to the next academic level. Education was only accessible to a few, privileged students. Post the handover of Hong Kong to China in 1997, Hong Kong faced a new challenge to re-evaluate its outdated education system based on the 1941 British curriculum. The Hong Kong government has diligently put in efforts in emerging out as a strong competitor within its neighbouring countries by reorienting and reforming its education system. Some notable changes include:

1) Globalization can be defined as "blurring the national boundaries in such a way, that local happenings are shaped by events occurring many miles and vice versa" (Burbules & Torres, 2000; pp.29). In order to sustain the competition due to globalization and unprecedented needs of the diverse economy (Chan, 2010), Hong Kong brought a major educational reform in the academic year 2009/10, called the "334" New Academic Structure (NAS) in Hong Kong. This reform states that 6 years of primary education is followed by 3 years of secondary school (S.1-S.3); 3 years of senior secondary school (S.4-S.6); and 4 years of University education. The NAS reform replaced the former system of 9 years of compulsory education with 12 years.

2) In order to advance into Secondary 1 (Form 1), Primary 6 students were formerly required to take the Academic Aptitude Test (AAT) conducted by individual primary schools. In the academic year 2000/01, this test was abolished under the Secondary School Places Allocation (SSPA) mechanism to avoid unnecessary drilling and stress on the student and further encourage schools to focus on the English language in Primary 5 and 6.

3) Students are assigned designated band (level) of school, from 1-5 (1 being the top and 5 being the lowest, based on student's academic results and school reputation. Since September 2009, the school bandings were reduced from 5 to 3 in order to remove the labelling effect and further broaden the admission criteria (Reform, 2000).

4) Average classroom size is 28 students so that teachers can provide individual attention and focussed learning. With the implementation of Small Class Teaching (SCT) in 2009/10, ordinary schools will have more capacity to enhance the learning effectiveness of students with special educational needs (SEN).

5) Enhance students' bi-literate and trilingual abilities in Cantonese, English and Putonghua (Mandarin). English is used as a medium of instruction mostly in English language Subject (ELS) classrooms. The medium of instruction in primary schools is Chinese (dominance).

6) Integration of Information technology (IT) within classrooms and computer labs in schools was based on the new strategy (2008), entitled "Right Technology at the Right Time for the Right Task".

7) Since 1993, most schools follow whole-day schooling (8:00 am to 4:30 p.m) format as it provides opportunities to design and implement a more flexible curriculum. Also, it provides more time and opportunities for social interactions among teachers and students (EDB, 2000). Very few schools still follow A.M. and P.M. schooling format.

8) Through-train mode: Direct collaboration between linked primary and secondary schools provides a continuity in educational experiences through consistent teaching methodology and linked curricula. This allows students to be directly promoted from P.6 to S.1 without having to take any standardized tests. Also, each secondary school also has some seats available for students wanting to enrol from an unlinked primary school, based on a student's performance in interviews, tests or former academic scores. ("Reform Proposals...," pp. 7)

9) Suggested lesson time division allocation for subjects in Primary curriculum (P.1-P.6): Chinese Language 25-30%; English language 17-21%; Maths 12-15%; General Studies (Science; Technology; Social Personal & Humanities) 12-15%; Arts 10-15% and Physical Education 5-8%.

10) Home-school collaboration provides synchronization and interactions between parents and teachers to reflect and exchange ideas on the student's learning progress.

These changes were incorporated as an attempt to shift the perspective from a very examoriented school system to a student focused, inquiry based system with greater possibilities to nurture holistic (whole) child education (Chan, 2010).

Goals and objectives

The term *curriculum* can be defined as the set of total learning experiences through which students learn (HK Curriculum, 2002). The Hong Kong Basic Education Curriculum Guide (2002) has set the following seven learning goals:

- 1. Recognize their roles and responsibilities as members of the family, society, and nation; and show concern for their well-being;
- 2. Understand their national identity and be committed to contribute to the nation and society;
- 3. Develop a habit of reading independently;
- 4. Active, confident engagement in English, Cantonese, Putonghua
- 5. Develop creative thinking and master independent learning skills
- 6. Possess a breadth and foundation of knowledge in eight key learning areas
- 7. Lead a healthy lifestyle

The Hong Kong Curriculum framework has three interconnected components: Knowledge in Key Learning Areas, Generic Skills and Values and Attitudes (as shown in Figure B1).



Figure B1: Hong Kong Curriculum Framework (2002)

When closely examined, the Hong Kong Education Curriculum Framework is inspired from Tennant's (1995) A.S.K. theory, i.e., Attitude (Values and attitudes), Skills (Generic skills) and Knowledge (Key learning Areas). They include:

Knowledge in Key Learning Areas (KLAs) include Chinese Language; English Language; Mathematics; Personal, Social and Humanities; Science; Technology (cumulative for P.1-P.6); Arts and Physical education.

Generic Skills include collaboration, communication, creativity, critical thinking, information technology, numeracy, problem solving, and self-management and study skills.

Values and Attitudes: Values are belief-systems that guide a student's conduct and decision-making, while attitudes define the student's personal inherent qualities. They include respect for others, perseverance, responsibility, national identity and commitment.

"The framework allows different pathways for understanding the variable breadth and depth of content, and flexible use of diverse learning strategies and styles to suit individual needs of the students" (HK Basic Education Curriculum Guide, 2002, pp.8).

Assessment is an integral part of the learning-teaching cycle as it provides valuable insights/

information about the student's progress and achievements in relation to the intended learning targets and objectives, thereby helping learners, teachers and parents understand the student's strengths and weaknesses, and plan suitable actions for further improvement (CDC, 2002) (Figure B2 mentioned below).



Figure B2: Learning, Teaching and Assessment (2002)

Assessment can be classified as formative or summative (CDC, 2002):

Formative assessment is an on-going, informal assessment, which teachers conduct to closely monitor the student's continuous progress in a specific area, during regular teaching and learning sessions (E.g. Projects, classroom group work, homework, oral presentations, etc.).

Summative assessment is a more formal, overall assessment that is conducted periodically (e.g. Tests, exams at the end of a school term or school year) to measure attainment and provide a comprehensive summary of learners' achievements at that particular point of time.

In context to ELS education, the Hong Kong Curriculum encourages schools to conduct both kinds to assessments in order to get a holistic understanding about the learning and progress of students from multiple perspectives of reading, listening, writing and speaking of English Language subject.

APPENDIX C

P.4 and P.5 students' questionnaire-survey

I am a 60 / 00 in P.4 Date:
"Games in English P.4 Classrooms"
Please put a* ✓* to show your choices.
1. Do you like to play games during English lessons?
2. Do these games help you to understand the Chapter? 🛞 🗌 🙆 🗌 🔗
3. Do these games help you to improve your English?
4. Do you want to play more games in English lessons?
5. Which English game did you enjoy the most? Mark them as 1, 2, 3. (1 = most favourite 2 = less favourite 3 = least favourite) Image: Comparison of the provided of the prov
boring OK fun boring OK fun boring OK fun
7. Does your English Teacher help you to clearly understand 🛞 🗌 🞱 🗌 🛞
8. Do you enjoy learning from the powerpoint before Playing the game?

Watch English cartoon	glish books I Read English ner Write English poems/storie:	s spapers
16. What do you do to improv	e your English?	
Always Mostly	Sometimes Never	
15. How often do you speak in	English with family and friends?	
If yes, can you write the names	s of the games?	
14. Do you play any kind of En	glish games at home? YES	NO NO
	"English in daily life"	
13. Are you good at English su	bject?	
12. Would you like to play such	English games on computer?	
11 Would you like to play such	names next year in D57	
10 Do you like doing such you	dehaate?	
boring OK fun in Bifficult OK easy	boring OK fun difficult OK easy	difficult OK easy
ا 9. What do you think about ea	ch worksheet?	
	Committee.	
	1 4 3 5	
and an and a second	Tagetter allere aller have a successive and and	Theat the personal participants

I am a 💮 / 💮 in P.5	Date:
"Games in English P.5 G	Classrooms"
	Please put a * 🗸 to show your choices.
1. Do you like to play games during English lessons?	80 80 80
2. Do these games help you to understand the Chapter?	80 80 80
3. Do these games help you to improve your English?	<u> 80 80 80</u>
4. Do you want to play more games in English lessons?	\$ <u></u>
(1 = enjoyed more 2 = enjoyed less)	
6. What do you think about each game?	oring OK fun
difficult OK easy dif	ficult OK easy
7. Does your English Teacher help you to clearly understand "how to play the game" to you?	®□ ®□ ®□
8. Do you enjoy learning from the powerpoint before playing the game?	90 90 90

z = enjoyed nore z = enjoyed less)	1
Hardward In	(H)
	2.1
Charles and an extension	1
	1
	7
9. What do you think about each worksheet?	
difficult OK easy difficult OK	
10. Do you like doing such worksheets?	그 쓰므 쏘
11. Would you like to play such games next year in P.6?	
12. Would you like to play such English games on computer?	I SL SL
13. Are you good at English subject?	_ @ %L
"English in daily life"	
14. Do you play any kind of English games at home? YES NO	
If yes , can you write the names of the games?	
15. How often do you speak in English with family and friends?	
Always Mostly Sometimes Never	
16. What do you do to improve your English?	
	rs
Nothing Read English books Read English newspape	
Nothing Read English books Read English newspape Watch English cartoons Write English poems/stories	

APPENDIX D

Understanding 'gameness' within the SCRABBLE[®] family of English word games.

(Paper presented at 7th ECGBL at Porto Portugal on October 4th, 2013)

Abstract: The Scrabble® family of games primarily focus on the nurturing and development of language (E.g. English) vocabulary skills. They are usually designed for 2 or more players and by virtue are competitive and challenging. These word games are different, yet one can recognize them as the member of the same family. No single "essence" can be found among them. The objective of my paper is to identify and propose a model for the "gameness" quality recurrent to the selected 8 variations of Scrabble® word games. I use the word "gameness" in accordance to Juul (2003) to symbolize the core features that are necessary and sufficient for a game to be a part of the Scrabble® family of word games. My paper investigates eight Scrabble® (board and or card) games from Juul's (2003) three core aspects: the game; the game and the player; the game and the world. For the purpose of study, I have selected the following 8 variations of Scrabble® word games: Scrabble® Alphabet Scoop; Scrabble® Flash; Junior Scrabble®; Scrabble® Upwards; Scrabble® Slam; Scrabble® Dash; Scrabble® Original; and Scrabble® Trickster. This paper forms an integral part of my research study that primarily focuses on learning/teaching of English Language Subject (ELS) through board games within local Primary 4 and Primary 5 classrooms in Hong Kong.

History of Scrabble®

During the Great Depression (a financial and industrial recession from 1929 to late 1930s), an unemployed American architect named Alfred Mosher Butts decided to invent a board game. Butts wanted to create a game conjunctive of vocabulary skills and alea (chance). Initially, his game was named as LEXIKO, but later, it was renamed as CRISS-CROSS WORDS. Butts studied the front page of The New York Times in order to analyse the cryptographic structure of the frequency of 26 letters within the English language. He discovered that vowels (a, e, i, o, u) have more frequency in comparison to the consonants. Hence nine vowels' letter tiles were provided in the game to create frequent opportunities for making

new, diverse word combinations. Furthermore, the letter S is often used to make plurals. To prevent the game from being too easy, Butts limited the quantity of 'S' letter tiles in the game to four. Thus, his analysis was critically reflected upon the letter-distribution and the corresponding score-points for each letter within the 100 letter tiles of the game. For example, the letter z is worth 10 points and shows up only once whereas the letters a and i are each valued at 1 point and show up nine times a piece. The game-board is a symmetric grid of 15 x 15 (a total of 225 squares) with calculated opportunities for high scoring (double letter, double word, triple letter and triple word). Gradually, Scrabble word games' sales gained high momentum. After gaining media limelight (in television, newspapers and magazines), Scrabble became a "must have game". Currently, HASBRO owns the registered SCRABBLE® trademark in the United States and Canada and elsewhere, the SCRABBLE® trademark is owned by Mattel, Inc.

Scrabble[®] Word Games, Play and Cognitive Development

Fleishman (1972) defines ability as an individual's general trait that is the product of learning and development. Scrabble[®] Original is a product of word knowledge, mathematics and probabilities and involves three cognitive abilities (Halpern & Wai, 2007): (a) Verbal ability as word fluency is required for rapid retrieval of appropriate words from memory. (b) Visuospatial ability is required to identify and relate the spatial layout of words and letters on the particular squares, to the probability of scoring more points. (c) Numeric ability is required to calculate the numeric properties associated with different letter and word combinations located in different places on the board.

Scrabble[®] Original game starts from the board's centre and outwards (Halpern & Wai, 2007). Players exert effort to create new, different, longer, and unusual, legal words (words listed in the Official Scrabble Player's Dictionary) using visuospatial and numeric abilities in order to attain the intended goal - high numeric scores. Scrabble[®] Original also nurtures a player's diverse abilities such as concentration, alertness, speed, memorization, anagramming, words knowledge, word understanding and tile tracking. Anagramming is defined as the ability to rearrange letters to make different words in order to find the best possible play on each move (Fatsis, 2001). Word knowledge is the ability to know whether a given word is a part of the Official Scrabble Player's Dictionary or not (Halpern & Wai, 2007). In contrast word understanding means to be able to understand the true meaning of any given word. Tile tracking is the ability of the player to keep a track of the letters that have already been played in the game so that the probability of drawing a particular letter on the future rounds can be computed (Harlpen & Wai, 2007). Piaget (1951, 1962) relates play as a function

of age and cognitive development. The Scrabble[®] games nurture the different stages of cognitive development based on the player's age and abilities.

In Figure D1, I have superimposed the forms of play (Smilansky, 1968) and stages of cognitive development (Piaget; 1951,1962) with the corresponding users' age specific Scrabble[®] word games. This helps to understand the relationship between the complexity of each game (as a system) in relation to the cognitive abilities and capabilities of the intended user-groups.



Figure D1: Scrabble® word games and Child Development

Investigating "Gameness" within 8 Scrabble® English word games

I use Juul's (2003) insights on gameness along with the amalgamation of game-definitions (as stated earlier in Figures 12(a) and (b)), as the theoretical base for investigating 'gameness' qualities recurrent to the Scrabble® family of English word games. My objective is to identify and propose a model for the 'gameness' recurrent to the selected 8 Scrabble® word games. For the purpose of investigation, I selected the following 8 Scrabble® word games: Scrabble® Original; Scrabble® Alphabet Scoop; Scrabble® Flash; Junior Scrabble®; Scrabble® Upwards; Scrabble® Slam; Scrabble® Dash; and Scrabble® Trickster. Each game has been played 53 times (15 times by different users

within the target user group ages 6-10, as specified by the game and self-played 38 times).

The Figure D2 describes the attributes observed within the diverse Scrabble® games:

	GAME AS A SYSTEM			_	-			0.00	
8 Diverse Scrabble" English Word Games		O H I G I N A L	5 U O O P	FLASH	JUNIOR	U P W A R D S	D A S H	SLAM	TRICKSTER
	Madifiable Rules		-						_
	No Rules	-			-		-		-
	Fixed, Constitutive Rules	~	~	"	~	~	~	*	*
	DIVERSE RULES IN SCRABBLE GA	MES	_	_	_	_	_	_	-
	Earn opponent's score	-		-	-		-	-	٠
	30 letter stocking	-		-	-	1	-	~	_
	Change words by replacing letters	-	_	4	_	~	-	1	٠
	Change words by adding letter(s) at one/both ends	~		"	~	1	1		٠
	Make plurals	4		"	~		~	~	٠
	Exchange letters with other players								٠
	Exchange racks with other players								٠
RULES	Exchange letters for new ones	4	4		4	1	~		٠
	Make repetitive words							*	
	Words can spell left to right (horizontally)	1	1		4	4	4	*	٠
	Wards can spell right to left (backwards)								
	Words can spell top to bottom (vertically)	1			4				
	Words can spell bottom to top (vertically)	_							
	Start from the center on the board and outwards	1			~	V	-		
	Start from anywhere on the board				4				
	Aandomly choose letters	1	4		V	V	1	V	
	Already provided with random, pre-determined letters	-		4			-		
	Ployers take turns to play	12		V	1	~	-	-	
	Players play simultaneously	-	-	-	-	-	4	~	-
	The of inefficient means	12	2	1	1	1	-	2	-
	ope of anequation means	-							-
	Use of efficient means	-	-	_	_	-	_		-
	MEANS in Scrabble games (Not M	edum	-	_	_	-	-	-	-
	Play with 7 number of letters at one time			-	-	~	"	~	٠
	Play with less than 7 number of letters at one time	-			~	-	-	~	-
	Play with more than 7 number of letters at one time	-	1		_			*	_
	Blonk tiles	1	~		~		_	*	٠
	Double letters (ligotures)					4	-		
	Means for Bonus (value addition)	1		~	4	1		~	٠
MEANS	Means for Penalty (loss)	1	1		4	4	-		٠
	Some letters in hand throughout entire game-play			~				~	
	Calculated, diverse distribution of the number of letter tiles								
	based on the frequency of letters in English language and to	1	~	"	1	1	"	*	٠
	maintain a level of difficulty for target age groups	_							
	Identical distributions of frequencies of letters	1	*						٠
	Valorization of Individual letters	1	100				1		٠
	No valorization of letters		~	~	4		~	*	1
	Symmetric, valorized grid	4			4				٠
	Empty grid	-				*	-		_
	No sold	-	4	~	4		~	~	
	110 9110	_	-		1.1	1000	1.1		
	Common gome spoce	1							
	Common game space Individual game space	~	~		-	~	-		
	Common gome space Individual gome space Alea (Chance)	~	2	2	-	~	-	~	
PLAY FORMS	Common gome space Individual gome space Alea (Chance) Assa (compartition, challense)	~ ~	222	***	~	~ ~	~ ~	~	
PLAY FORMS	Common gome space Individual gome space Alea (Chance) Agon (competition, challenge) Spacific (space) automme	2 22	>>>	>>>	~ ~ ~	~ ~ ~	~ ~ ~	2	*
PLAY FORMS	Common gome space Individual game space Alea (Chance) Agen (competition, challenge) Specific (some) autoante Variable outcome	2 2 2 2	222 7	222 2	~ ~ ~ ~	~ ~ ~ ~	~ ~ ~ ~	2 2 2 2	*
PLAY FORMS OUTCOME	Common gome space Individual game space Alea (Chance) Agon (competition, challenge) Specific (some) outcome Variable outcomes Charabile outcomes	2 22 22	>>> >>	>>> >>	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	~ ~ ~ ~ ~	~ ~ ~ ~	× × × × ×	

Figure D2: Attributes in Scrabble® family of English word games

	THE GAME AND THE PLAYER								00
8 Giverse Scrabble* English Word Games		0 # = 0 = N 4 L	5 U O O P	FLASH	J U N I O R	UPWARDS	0 4 S I	S L A M	TRICKSTER
	Single Player	~		~		V			-
LUIS STATE OF ALL SUPPORT	2 Players	1	v	1	~	~	4	~	~
NUMBER OF PLAYERS	3-4 Pippers			*	*	~		*	-
	5-6 Players		100	*		1	1		
	Make unusual words	~	-	4	*	~	_	~	~
	Make long words	~	-		~	-	-		-
	Finish the name first (second / time)				*	-		-	
	Make more words in limited time (speed)	-		-			2	2	\vdash
	Make limited and specific words	-	v	v	V	~	v	v	H
	Make 2 letter words	1		-	v	~	V	-	-
	Make 3 letter words	~	*	V	*	~	4		~
COALS BLANCE FEEDER	Make 4 letter words	*		1	*	~	*	~	*
OUNCE, PENTER EFFORT	Make S letter words	~	*	*	*	~	v		*
	Make 6 letter words	1	-		*	-	*		
	Make 7 letter words	1		_	*	-	~	_	
	Make 7+ letter words	~	-	_	~	~	_	_	~
	Build Crosswords		10	-		-	_	-	
	Parate anothing woods in a move Alternate adjacenced	-		-	5	~	-	-	-
	Hunt for specific letters	-	1	-		-	-	-	-
	Score more points	4	-	V	V	4	~		-
NAMES ATTRACTOR	Fun-oriented, immersive engagement	1	~	*	~	~	~	~	~
PLATERATITUDE	Serious, Intense engagement	*							
PLAYER ATTACHMENT TO	Yes	1		*	*	~	*		~
THE OUTCOME	No		_		_		_		
	Time-bound gome	1		~	_			-	-
DURATION OF GAME	Short (0-20 minutes)	-	"	_	-		~	-	-
PLAY	Medium (21-40 minutes)	1	-	-	*	10	-	-	-
	Complete 60 minutes/ Commission and in a Mare than 61 minutesi	5	-	-	-	-		-	÷
	I succeed how and a second			-				-	-
	Board pame	"	~	_	~	~	-		*
MEDIUMS	Cord game	-	-				~	~	-
1.0000002	Computer parte Yashaalaas dalaas taasible aanas		-	5		~	-	-	-
	secondargy envelopmente	-	-		F	_		_	-
AND ACT OF CALARDO AN	The GAME and the rest of the WORLD	12	-	-	-	1	121	2	-
ON THE PLAYER	Ward understander	15	5	5	15	5	5	5	-5
and the constant	Assessments abilities	12	2	5	2	2	5	2	1.5
	Ulcuscential abilities	12	2	2	2	2	2	2	10
	Numanic skills	1	-	2	1	2	1.0	-	
	Learn new words	V	V	V	2	~	V	~	
	Memory skills	V	-	V	V	V	V	V	
	Motor skills and reflex	-	~	V	1	4	4	V	-
	Attention, concentration	1	1	4	1	~	~	~	
	Verbal abilities	V	V	V	~	~	-	~	
	Sensitivity towards spelling	~	~	~	~	~	~	~	
CONSEQUENCES OF GAME-PLAY	Serious and Interna Competitions	12		-	-				-
	(National & International Tournaments)	1							
	Facilitates separate Social groupings	V		4			~	V	
	Collaborative learning at homes / schools	1	V	V	V	V	V	V	
	Affinity towards learning new words	1	1	~	V	~	V	~	
	More affinity towards rhyming words	-	-	-		V	4	V	t
		-	-	-		~	V	~	t
	More affinity towards alliteration (Alliteration occurs when a				-				- C
	More affinity towards officeration (Alliteration occurs when a series of words have the same first consonant sound. E.a.					123	650		1
	More affinity towards alliteration (Alliteration occurs when a series of words have the same first consonant sound. E.g. claw, clad, clap, clop, clot)						684 233	10	
	More affinity towards alliteration (Alliteration occurs when a series of words have the same first consonant sound. E.g. claw, clad, clap, clop, clot) More affinity towards werb tenses (with alliteration)					-	-	-	
	More affinity towards oiliteration (Alliteration occurs when a series of words have the same first consonant sound. E.g. claw, clad, clap, clop, clot) More affinity towards verb tenses (with oiliteration) Hobit of consulting dictionary for help	~	_	~	~	~ ~	22	~~	
	More affinity towards oiliteration (Alliteration occurs when a series of words have the same first consonant sound. E.g. claw, clad, clap, clop, clot) More affinity towards werb tenses (with oiliteration) Hobit of consulting dictionary for help Representational and fun-oriented way of learning	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	22	222	222	~ ~ ~	

Figure D2: Attributes in Scrabble® family of English word games (continued)

Observations and Findings

The following core aspects that define "gameness" within Scrabble® family of English word games are identified below:

- 1. Defined by constitutive, fixed rules
- 2. Use of inefficient means
- 3. Variable and quantifiable outcomes
- 4. Valorization of outcomes
- 5. Players are attached to the outcomes
- 6. Consequences of game play are negotiable.
- 7. Scrabble games are primarily designed for 2-4 players.

8. Through diverse lusory means and constitutive rules, scrabble games facilitate the following learning (cognitive) goals: attention, memory, concentration, verbal abilities word knowledge, word understanding, anagramming, visuospatial abilities, sensitivity to spellings, and motivates players to learn new words search. All Scrabble games share similarities in their intended learning/ educational goals and encourage collaborative learning in home and schools environments. They are a fun representational tool for learning and enhancing English word building and vocabulary skills. Scrabble games are a conjunction of alea and agon.

9. Building 4 letter words horizontally from left to right is the common intended goal found in all Scrabble word games.

10. The games have predetermined diverse distribution of letter tiles based on the frequency of letters in the English Language and to adequately serve the intended goals in each game.

The findings mentioned above, highlight that "gameness" within the Scrabble family of English word games is quite generic and similar to Juul's (2003) game definition. It is difficult to identity any one specific attribute that is common to all the Scrabble games mentioned above. In order to identify inter-relationship among the selected 8 Scrabble word games; I used Agglomerative Hierarchical Clustering (AHC) analysis as a method to analyse the above data. The number of entities (n) is 8 (Scrabble word games) and the nominal coding of 106 variables is yes=1, no= 0.

The Figure D3, mentioned below provides a visual representation of inter-relationship between eight Scrabble[®] word games through a dendrogram:



Figure D3: Dendrogram for Scrabble® word games

Conclusion

My research paper draws preliminary light on the inter-relationships between the selected 8 Scrabble[®] word games. It would further help academic researchers and game designers to explore possibilities for diverse constitutive rules and lusory means for creating new, interesting, and challenging conflict in Scrabble[®] games. For instance, what happens to the game-play wherein certain English letters can be used in reflection (horizontally or vertically)? If "w" can be used as "m"; "b" as "d"; "q" as "p" "u" as "n"; then how would it affect the letter distribution and game play? Design a Scrabble[®] word game that uses letters having recurrent ligatures in English language (st, Qu, Th, ch, fi, etc). This paper forms an extended part of my research study that primarily focuses on learning/teaching of English Language Subject (ELS) through board games within local Primary 4 and 5 classrooms in Hong Kong. References:

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