Implementation of Problem-based Learning in the senior secondary Liberal Studies curriculum in Hong Kong

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Copyright statement

Declaration

I declare that this thesis represents my own work, except where due acknowledgment is made, and that it has not been previously included in a thesis, dissertation or report submitted to this university or to any other institutions for a degree, diploma, or other qualifications.

Signed……..

KAUR Kalwant

Acknowledgement

This thesis demonstrates a milestone of my 6 years up-the-hill battle with many aspects of life, including my studies, professional and personal life. The EdD programme, helped me understand more deeply not only about how teachers and students think and why they do things, but also about my own strengths and weaknesses both as a teacher, a researcher, and a person in general. The experience was painstaking at times, but the outcome is overly sweet. Many people have indeed been of great help in my successful completion of this thesis, and I would like to take this opportunity to thank them.

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ABBREVIATIONS

CDC – Curriculum Development Council

COTAP – Committee on Professional Development of Teachers and Principals

DSE - Diploma for Secondary Education

DSS - Direct-Subsidised Scheme

EPA - Economics and Public Affairs

GE - General Education

HK – Hong Kong

HKDSE - Hong Kong Diploma of Secondary Education

IH - Integrated Humanities

LS – Liberal Studies

PBL – Problem Based Learning

PSHE - Personal, Social and Humanities Education

SBA - School Based Assessment

SDL – Self Directed Learning

TTM - Traditional Teaching Method)

ZPD – Zone of Proximal Development

ABSTRACT

Over the last decade, there has been an increasing interest in curriculum innovation and education reform in Hong Kong (HK). Since the introduction of Problem Based Learning (PBL), many educators have adopted a PBL approach as the educational and philosophical basis of their curriculum. PBL is a student-centred approach that emphasises collaborative learning, self-directed learning (SDL) and problem solving. Several studies have shown that PBL is an important educational approach for integrating the curriculum and engaging students in learning. However, there is a great deal of concern regarding PBL in HK and the potential advantages of this over a more Traditional Teaching Method (TTM).

This research study implemented PBL as a pedagogic approach within the Liberal Studies (LS) curriculum to explore if it could help to engage students in learning, enhance collaboration, SDL, problem solving and how teachers engaged with PBL as a teaching pedagogy. A case study mixed-method approach was employed to gather data from three PBL and one TTM class. The study was undertaken in two phases. Phase I was a qualitative approach in which students and teachers were invited for semi-structured interviews, students' focus group and additional field notes were gathered. Phase II was quantitative in which students and teachers were invited to complete a questionnaire. Following data analysis, three themes emerged, namely: (1) Student Engagement under PBL, (2) Students' concerns under PBL and (3) Teachers' concerns under PBL. A key finding from the study demonstrated that the PBL approach encourages student engagement and SDL. However, the findings from the study also showed that actively engaging in the lesson is not the only measure for student engagement. The data from this research study revealed that PBL learners acquired more LS knowledge than students learning under TTM.

Furthermore, the findings also showed that PBL increases the workload of LS teachers. This research study can help teachers to reflect and discover the concept of PBL as a teaching approach and how it affects students' engagement. In conclusion, the findings of this study support applying PBL as a pedagogic approach to enhance student engagement. It is evident from this study that

further research is needed in other subjects, cultures, and lesson observations to understand students' behaviour to further develop our knowledge and understanding in this area.

CHAPTER ONE
THE RESEARCH PROBLEM

1.1 Overview

This chapter presents an overview of the thesis. I will explain Hong Kong's (Hong Kong) education system and the emergence of problems in the local secondary education in Hong Kong. After defining why Hong Kong students are claimed to be introvert learners, aims of this study, the professional context setting, and the significance of this study will be enunciated. The research questions are then put forward.

This research study was conducted in a senior secondary school (high school) in HK. It aimed to investigate how Problem Based Learning (PBL) pedagogy could influence students' engagement in learning Liberal Studies (LS).

1.2 Background of the Study

The purpose of this research study was to explore the effectiveness of PBL as a pedagogic approach in the senior secondary LS curriculum in a secondary school applying the local Diploma for Secondary Education (DSE) curriculum in HK. Therefore, the primary purpose of the research study is to understand and interpret students' and teachers' perspectives on factors that could influence the successful use of the PBL approach in teaching and learning LS. It is a qualitative-oriented study, supplemented with quantitative data. This research study reports findings from students' and teachers' questionnaires, semi-structured interviews, a focus group, and field notes.

1.3 The Hong Kong Education System

The education system in HK has undergone a substantial change over the last decade. The HK education system was modeled on its former colonising power (1842 – 1997), the United Kingdom (UK) in the 1960s. The UK O Level and A level was classified as The Hong Kong Certificated of Education Examination (HKCEE), which was taken on completion of Year 11 (secondary 5) and

Hong Kong Advanced Level Examination (HKALE), taken two years later at the end of Year 13 (secondary 7). In 2005 the University Grants Committee (UGC), the central body governing higher education in Hong Kong, mandated a change from a 3 to 4 years' undergraduate curriculum for the eight universities under its jurisdiction. The additional year would allow for the development of a General Education (GE) curriculum. The 4 years' curriculum became the required standard for all students beginning in Fall 2012. As part of the significant 3–3–4 educational reform, "senior secondary education'' was reduced to 3 years and students could enter institutions of higher education a year earlier. Public examinations were replaced to only one exam, Hong Kong Diploma of Secondary Education (HKDSE) to be taken upon completion of Year 12 (secondary 6) starting from 2012 (see Fig. 1).

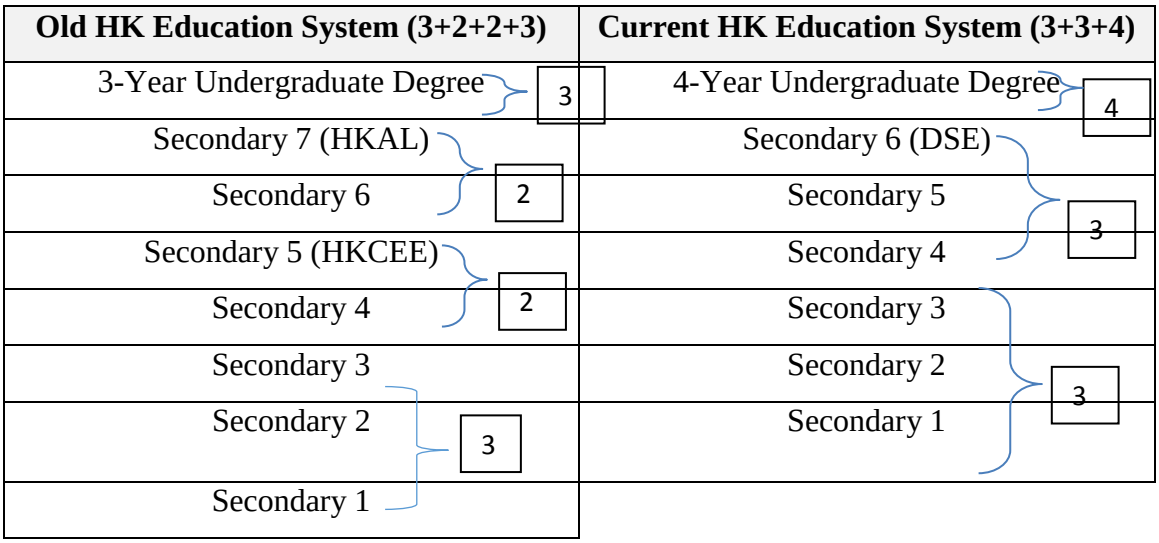

Figure 1: Structural changes in Hong Kong's Education System

Under the education reform, Integrated Humanities (IH) was introduced as a new subject to be offered from Secondary 1 (Year 7) to Secondary 3 (Year 9) in Hong Kong since 2000. IH provides a wider scope of integration of various subjects such as Economics and Public Affairs (EPA), Geography, History and Civic Education. It facilitates students' development of an understanding of issues from a broader horizon and various perspectives. There is no prescribed syllabus for IH but it is an integrated curriculum covering the learning elements of Personal and Social Development, Resources and Economic Activities and Social Systems and Citizenship. The IH curriculum aims to develop students' understanding of themselves as individuals and as social

beings and gives them an opportunity to understand local, national, and global economic activities. IH also encourages students to develop their awareness of and interest in the local and national socio-political system and help them to develop global perspectives through exploring international issues and world politics. Schools can introduce different modes of integrated curriculum with reference to the six strands of the Personal, Social and Humanities Education (PSHE) Key Learning Area naming:

1. Personal and Social Development
2. Time, Continuity and Change
3. Culture and Heritage
4. Place and Environment
5. Resources and Economic Activities
6. Social Systems and Citizenship.

In senior secondary (Year 10 to 12) IH is named LS, which is a core subject in the senior secondary curriculum. The aim of LS is to broaden students' knowledge base; enhance their social awareness through the study of issues of significance to students, society, and the world; and foster students' capacity for life-long learning (CDC-HKEAA, 2007). LS emphasises learning through inquiry, interdisciplinary learning, and scaffolder instruction to achieve these aims. The main objective of LS is to help students develop an understanding of themselves, their society, their nation, and the world. The LS curriculum consists of 6 modules, namely:

1) Personal Development and Interpersonal Relationships
2) Hong Kong Today
3) Energy, Technology, and the Environment
4) Public Health
5) Modern China
6) Globalisation.

The learning and teaching approach for LS is structured around enquiry into a range of life and social issues. Teachers facilitate students to understand the complex and controversial nature of

the issues by encouraging them to ask questions and find answers actively. Enquiry into issues requires students to analyses things from various aspects. Students need to develop a range of thinking and information-handling skills by comparing and understanding the viewpoints of various stakeholders to make informed choices and sounds decisions. LS requires discussions and often conducts an in-depth analysis of arguments, which helps to develop thinking and debating skills (EDB Curriculum and Assessment Guide for LS, 2012).

One of the factors for this change was the transition of Hong Kong's economy from manufacturing to a tertiary and knowledge-based economy. According to the UGC, ''knowledge workers are defined as highly educated with diverse and adaptable skill sets'' (University Grants Committee 2002). As the economy transitioned from manufacturing to service orientation, the labour force weaknesses, may have become increasingly apparent. There were growing concerns about the international competitiveness of Hong Kong university graduates. This also influenced the level of importance in gaining high grades in public examinations to enter the tertiary industry of Hong Kong.

Schools in Hong Kong have always emphasised spirit and morale raising ceremonies, compulsory uniforms, strict discipline, and an authoritarian school climate. However, in 2000, the Education Commission (2000) submitted to the Government the Reform proposal for the Education System of Hong Kong, which was to promote lifelong learning, as it was believed that students in HK are not given comprehensive learning experiences with little room to think, explore and create. To make up for these weaknesses, there was a need to uproot outdated traditional pedagogy and develop a new education system that was student focused.

The Reform Proposal for the Education System in HK (Education Commission, 2000) brought the beginning of a milestone reform of the Education System in HK. The reform focused on the curricula and assessment mechanisms. The Government implemented reform measures to bridge the gap between secondary and university education. Among the various subjects, LS became a new core subject for secondary education (CDC and HKEAA, 2007). The Curriculum Development Committee (CDC) also required an issue-enquiry approach for learning and teaching LS. The issue-inquiry approach encourages students to develop a capacity for independent learning

in the pursuit of knowledge and openness to new possibilities in the knowledge society (Bereiter, 2002a; Smith, 2002; Cheng, 2004).

However, LS was perceived differently by HK educators (Fung, 2014). LS triggered not only substantial concerns among teachers but also parents and students. HK people had very diversified views over LS. They expressed themselves openly on social media and city forums, which was a public forum held weekly on Sundays in Victoria Park, HK. This forum brings together politicians, academics, and prominent public figures to discuss current issues and allow the public to participate in a question-and-answer session.

Recently, the Review of School Curriculum Consultation Document (Consultation document, 2019) invited views from the public on various subjects, including LS. For LS, there were views from the public that the curriculum content and concepts involved are not well delineated and defined. Some people consider that the LS subject has become a platform for a superficial recount of current affairs without providing a sufficient knowledge base for meaningful discussion to take place. To create space for learning and teaching and cater for learner diversity, the Task Force suggests that schools should be allowed to opt out the School Based Assessment (SBA). As the SBA takes up at least one-third of the total lesson time, the opt-out would notably free up this amount of space for use in many ways, including enabling teachers to teach and students to learn the subject's modules more thoroughly.

The school curriculum in Hong Kong now increased emphasis on SDL, authentic and interdisciplinary learning (Chan and Ho, 2013). Furthermore, facing the challenge of the 21st century, the HK Education Department start paying much concern on the quality of HK education.

1.4 Introvert Chinese Learners

The setting of this study was in a HK local school, where all the students are local HK Chinese. "Local" students are those of Chinese ethnicity, using Cantonese (a dialect used in Guangdong province, China) as their mother tongue. They were born and raised in Hong Kong. It is, therefore, appropriate to understand the Chinese students' approaches to learning. HK students display

almost unquestioning acceptance of the knowledge of the teacher. This may be explained as an extension or transfer of the Confucian ethic or filial piety, which means a virtue of respect for one's parents, elders, and ancestors (Bedford and Yeh, 2019). Many authors have the perception that Chinese students are passive learners. They have pointed out that it is due to the overall culture in Asian societies, contextual and system perspectives (Biggs, 1996; Bond, 1991; Wong, 2004 and Lee and Mok 2008).

Chinese students are believed to be over-dependent on their teachers, too shy to ask or answer questions (Blidi, 2016). A possible reason is believed to be the threat of losing face in front of teachers and peers when the student answers incorrectly. In Chinese culture, students always show great respect to their teachers as they are, seem to have the authority to determine what and how to be taught. In the classroom, the teacher usually initiates most of the communication and students speak up only when they are invited to. The students seldom challenge their teachers, whereas, in western culture, both teachers and students expect to be treated as equals (Cortazzi and Jin, 2001). Students can make uninvited interventions in class when they do not understand or even argue with teachers and express disagreement in class. Jin and Cortazzi (2006) identified that Chinese students collectively look at their academic life and care for positive relationships and communication with others. They avoid situations that may cause anybody (both themselves and others) to lose face.

Some scholars, for example, Zeng (2006) have argued that it is stereotypical to suggest that Chinese learners are passive. In fact, they prefer not to challenge teachers and interact with their teachers one-to-one after the lesson is finished (Zeng, 2006; Chan 2012). Chinese learners have been brought up to respect knowledge and wisdom; as part of their cultural upbringing, they have been socialised to respect teachers and those who provide them with knowledge (Chan, 1999). Huang (2005) states these authority relationships between students and teachers reflect Confucianism and the high-power distance in Chinese culture. Due to high power distance, the teacher is held in great respect; students would consider it as disrespectful to ask questions or debate with teachers in class. The perception of Hong Kong students being passive and reticent is problematic. Littlewood and Liu (1996) found that Hong Kong students are eager to adopt active roles in the classroom.

A new teaching method such as PBL is an option for improving local education in terms of providing a methodological choice, a shared experience of learning and support for the development of employability skills. PBL has the potential to positively affect student learning and content acquisition (Wirkala and Kuhn, 2011). Students engaged in PBL do not always achieve a higher level of learning than traditional students. However, students engaged in PBL are more likely to demonstrate content knowledge by developing a deeper understanding of concepts that are transferable and applicable to real world situations Walker et al (2015).

1.5 Aim of the Study

The main purpose of this research study was to explore and examine if participation in lessons taught using the PBL approach and working in small group settings can lead to higher student engagement. The present research study focuses on how PBL in the senior secondary LS curriculum in HK affects students' achievement in learning LS. The key objectives of this research were as follows: -

- Study the students' behaviour in a PBL class.
- If the group setting can facilitate student engagement
- Investigate the major factors influencing student engagement when learning under the PBL approach.
- Understand the problems students encounter when learning under the PBL approach.
- Difficulties faced by the teachers when teaching using the PBL approach.

1. 6 The Professional Context Setting

This research study was conducted in a secondary school in Hong Kong. During this research study, I supervised the Social Science department of the school and taught LS and Economics from Year 9 to 12. In this research study, my position is an insider researcher, which is when the research study is conducted where the researcher is also actively involved (Sikes and Potts, 2008). I hold prior knowledge and understanding of the group I am studying. This provided me with ample opportunities to understand the context of the case. My over 10 years of long-term involvement

with the school has placed me in a privileged position of trust. One of the biggest challenges of being an insider researcher is facing the task of managing the influence of being both the researcher and the researched and struggle to avoid exerting power with the participants. Being an insider may result in data assumptions (Chavez, 2008) or may influence my interactions with the participants as they might consider my position in school before sharing the information. Issues related to the 'gatekeeper' role (Wellington, 2015, p.31) and being in a position of authority (Silverman 2013) will be further explored in the ethics section.

The school involved in this case study is a Direct-Subsidised Scheme (DSS) school (partly subsidised) with English as the main medium of instruction. All DSS schools in HK have their Secondary 1 (Year 7) students' selection through independent criteria, based on the students' ability. Unlike government schools, they do not have to join the centralised space allocation system, where students are allocated to schools located in the nearest district. The main advantage of DSS schools is that they have more autonomy over curriculum design and the use of resources compared to government schools. The school involved in this research study is a co-educational school and uses a mixed ability approach to group students in different classes. Hence, all classes are of an equivalent level in terms of academic performance. This research study was conducted in LS lessons, which is a compulsory subject offered to all senior secondary students from Secondary 4 (Year 10) to Secondary 6 (Year 12) in HK. The LS is one of the core subjects in HK, including English, Mathematics and Chinese.

1.7 Significance of This Study

Schooling is not just for literacy and numeracy scores but also for various generic skills to enable students to become individual thinkers and learners (Fullan, Hill and Crevola, 2006). Whether LS is a blessing or a curse, depends on teachers' understanding and success in delivering the lesson using the appropriate approach. Optimistically, LS can liberate minds and extend students' perspectives with its unique knowledge building nature. It can initiate high and critical thinking skills. Its' potential contribution to the evolving nature of education in the Knowledge Society (Bereiter and Scardamalia, 2003; Cheng, 2004) can be explored and consolidated. However, if LS cannot be displayed in students' learning appropriately, it would be regarded as a subject

facilitating chaotic ways of sharing opinions. The following chapter will review scholarly articles providing a critical evaluation of PBL as a pedagogic approach followed by research methodology and data analysis in Chapter 3. Findings are presented in Chapter 4 followed by discussion and finally, the thesis is drawn to a conclusion in Chapter 5.

1.8 Research Questions

The research questions presented below were formed due to apparent evidence gaps in the reviewed literature. These questions were then used to explore how teachers and students integrate PBL into their LS teaching and learning.

The research questions are as follows:

1. What effects does a PBL approach have on the teaching style of LS teachers in Hong Kong?
2. How does the PBL approach affect students' engagement in learning LS in Hong Kong?
3. How does PBL influence the knowledge gained by students through collaborative learning in Hong Kong?

1.9 Synopsis of the Research Study

This research study consists of five chapters. Chapter 1 sets the scene by introducing the background, aim of the study, professional context, significance, and the research questions. Chapter 2 provides a literature review for this study, followed by the rationale behind conducting a study of implementing PBL to understand its influence on students' engagement in a local secondary school in Hong Kong. Chapter 3 reports on the research methodology used in this study. The adoption of mixed methods is further explained and justified, followed by details of the research design, data collection and analysis. The measures are taken to ensure trust worthiness of the data and ethical considerations, are also described. Chapter 4 reports on the findings from qualitative and quantitative methods under three themes namely; student engagement under PBL, students' concerns under PBL and teachers' concerns under PBL and discusses and analyses the

questionnaire, semi-structured interviews, focus group and field note results. Finally, Chapter 5 concludes the research study, reflecting on the limitations and future research directions.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

In this review of literature, the paradigm shifts in pedagogy and associated discussion surrounding the theoretical foundations are critically examined. Firstly, the definitions and background of PBL are explored, with a particular focus on reviewing the features of PBL in learning LS. Finally, the theoretical perspectives adopted in this study. This chapter reviews the research area regarding the key concepts involved, such as liberal education, student engagement and collaborative learning. The literature review was organised by understanding the requirement of skills required in the modern workplace of the 21st century and the teaching and learning style.

2.2 Background

Biggs (1999, p. 58) suggests that "good teaching is getting most students to use the higher cognitive level processes that, the more academic students use spontaneously. Good teaching narrows the gap." The challenge, he argues, is to find a teaching method that maximizes the chances of engaging students' higher cognitive level processes. Henshon (2017) argued that teaching methods must focus on providing students with a strength-based, personalised education by cultivating their learning to meet the demands of a rapidly changing world of employment. In the 21st century, career skills focus on the ability of individuals to work effectively with diverse teams and be open-minded about varying ideas and values (P21st Framework Definitions, 2009). Employers look for someone who asks good questions, engages in good discussion, and can think critically. Today's workforce is not only defined by specialty but by the "problem you and your team try to solve or accomplish" (Wagner, 2010, p.15). Such problem solving and collaborative skills may enhance the opportunity for the students to be productive contributors in today's workforce.

However, Hsueh and Tobin (2003) believe that Chinese teaching is heavily influenced by the Confucian tradition, where Chinese students are generally encouraged to respect the perceived hierarchical relationship between individuals. In such a culture, students always show great respect

to their teachers as they are seen as having the authority to determine what and how to be taught. The traditional Chinese model of teaching is characterised by the transmission of knowledge principally through initiative, repetitive and rote learning, which is a lecture-style pedagogy (Hughes and Yuan, 2005). However, Henriksen, Mishra, and Fisser (2016) claimed that traditional lecture-based education might not be adequate for developing the functional knowledge required in the modern workplace.

Therefore, Confucian tradition and the skills required at the modern workplace are in conflict. The latter one requires asking challenging questions no matter whether it is asking a teacher at school or a superior at work. According to Hiebert and Stigler (2004), one factor found in international studies that characterizes higher performing countries is the use of cognitively demanding tasks and having students engage in critical thinking and reasoning.

2.3 Definitions of PBL

First introduced in medical schools in 1958, PBL involves the attempt to solve an authentic, ill-structured problem (Walker and Leary, 2009). There are various definitions of PBL; for instance, PBL is commonly characterized as driven by challenging, open-ended questions, collaborative learning, and constructivist pedagogies (Savery and Duffey, 2001). I will be drawing the definition provided by Walker et al. (2015), who stated that PBL is an instructional learner centred approach, where students have control and responsibility for their own learning, encountering research, integrating theory and practice, and applying knowledge and skills to develop a viable solution to a defined problem. Williams (2004) argues that PBL allows learners to identify what they need to know, analyse information, and communicate the findings to others. Biber (2012) added the idea of teachers helping students to recognise the problems, understand the causes of such problems and solve problems. The LS curriculum focuses on supporting students' development of higher order thinking skills and provides the context for an integrated application of different generic skills to construct knowledge. To teach an issue-based subject, such as LS, PBL is considered to be more appropriate for teaching LS by the CDC, as Hmelo-Silver (2004) has suggested that PBL is an instructional approach that provides a framework for teachers to help students develop

flexible understanding and lifelong learning skills. It is evident, from the literature, that PBL approach is a modern teaching method that allows learners to construct their own schema.

PBL has a lot of potentials to enhance the 21st century skills and engage students in real-world tasks (Bell, 2010; Han et al., 2015). PBL requires students to take an active role in a learning process that starts with a carefully designed problem statement that challenges students to use problem solving techniques (Ishiyama et al., 2015). Students are asked to identify what they already know, what they need to know, and how and where to access new information that may lead them to solve the problem. It is claimed by Han et al. (2015) and Kokotsaki et al., (2016) that during the process, students develop flexible knowledge, effective problem-solving skills, SDL, effective collaboration skills and allows intrinsic motivation.

Andrade and Evans (2013) identified that students' motivation increases when they are responsible for the solution to the problem, the process rests with the student and goals are clear and achievable. Walker et al. (2015) argued that the success of the PBL approach is the selection of appropriate problem statements depending on the ability of the students and the teachers who guide the learning process. PBL is a form of education characterised by a student-centred small group setting in which learning is driven by realistic but ill-defined problem statements (De Graaf and Kolmos, 2003).

Teachers using the PBL approach have different roles compared to a TTM (Traditional Teaching Method) approach; they are not concerned with what and how they are teaching rather, they are observing, looking, listening, stimulating, and facilitating student learning. Under the PBL approach, teachers need to be supportive and directive (Schneider, 2017*).* Teachers need to support students by influencing them through scaffolding to ensure they are engaged in the group and are consistent.

2.4 Problem Based Leaning and Project Based Learning

Problem-based learning (PBL) and project-based learning both are student-centred pedagogies based on constructivist theory (Savery and Duffy, 2001). PBL relies on the use of authentic but

simulated problems that students can solve together with appropriate assistance from the teacher. There are specific content objectives for each problem. In most PBL environments, students seek out materials (problem statements) needed to understand and solve the problem. Students work in groups and receive assistance and feedback from the teacher (Loyens et al. 2008). However, project-based learning can be an individual activity that is centred on students. Barron et al. (1998) suggest that PBL is the scaffold to project-based learning. Both PBL and project-based learning offer opportunities in classrooms for deep learning that enable the development of 21st Century teaching and learning skills deemed necessary for student success (The William and Flora Hewlett Foundation, 2010). Prince and Felder (2006) emphasis that project-based learning focuses on applying or integrating knowledge, while in PBL, it is on acquiring it.

2.5 Changes in Pedagogy in Hong Kong

Servant and Dewar (2015) stated that although Malaysia was the first country in Asia to adopt the PBL approach, the influence that this had on its teachers remains largely unexplored. PBL was first introduced to the Department of Physiology at the University of Hong Kong in 1992/93 and subsequently to the Faculty of Medicine as recommended by the research team undertaking the studies of PBL in teaching physiology and pathology (Kwan, Chan, Nichols, Sheng, and Wong, 1997). No extensive quantitative study has focused on the adaptation of the PBL approach by HK teachers who, in their education, are most likely to have experienced a teacher-driven environment but now must adapt to a student-centred approach. Upon the introduction of the LS curriculum in HK in 2012 many teachers expressed a lack of confidence in teaching such a multi-disciplinary subject and criticised the overly ambitious nature of the curriculum, which requires teachers to keep up to date with current issues and frequently modify teaching materials, thus increasing their workload (Fung and Liang, 2018).

Since 2000 when the CDC (Curriculum Development Council) members in HK shared experiences and recommendations in the Learning to Learn document, the focus shifted from TTM to flexible approaches to learning (CDC, 2000). The underlying reason for such a change was a concern that HK students lacked the generic skills needed to compete with other countries (Lai, 2009). In the revised Learning to Learn document in 2001 the government gave priority to critical thinking,

creativity, and communication skills among the nine generic skills, as they are crucial for helping students to appreciate the pleasure of learning to learn and reduce their dependence on the transmission of knowledge. Furthermore, effective learning and teaching strategies to strengthen these generic skills in existing subjects were also encouraged (CDC, 2019).

2.6 PBL in Hong Kong

The PBL approach provides learners with authentic problem statements without a clear solution. Wirkala and Kuhn (2011) considered PBL more effective than traditional learning in terms of students achieving better academic results. Wirkala and Kuhn (2011) found that students performed significantly better academically when they are engaged in PBL activities versus lecture-based learning. PBL is an appropriate approach for addressing new requirements of the LS curriculum (CDC, 2019).

However, Hung (2006) argued that there is a limited appreciation of PBL so far in HK schools as teachers are adamant that PBL is expensive, inefficient and time consuming; it takes more time for students to achieve the desired learning outcomes and is less effective compared to TTM because it provides limited guidelines to students, who often lose motivation as learning outcomes are not clear. Zeng et al. (2015) argued that although studies have shown that the academic achievements obtained using PBL are higher than those obtained using TTM, PBL puts greater demand on teachers, teaching time, learning space and increases the burden on the teachers. Therefore, PBL may seem less desirable than TTM to teachers in HK.

Since 2020, it is required by the Education Bureau of Hong Kong for all teachers to attend 45 hours of workshops or lectures on the professional development offered by the Committee on Professional Development of Teachers and Principals (COTAP). The main aim is to keep teachers updated on teaching and learning strategies. However, Teachers in Hong Kong still follow the TTM to achieve higher grades in public examinations (Chen, 2014). The focus of this research study was also to explore the viewpoints of teachers and students in adapting the PBL approach in a particular secondary school, where PBL is a relatively new phenomenon.

2.7 Traditional Pedagogy

The trend in the 21st century to match the modern workplace is for teachers to create a vibrant and challenging learning environment and balance this with ensuring the students remain active throughout the lesson and engaged with the content required (Strayer, 2007; Baker, 2000; Lage and Platt, 2000). This is not easy in HK, as teachers often find themselves constrained by curriculum requirements and the need to complete coverage of the heavy syllabus content knowledge (Consultation document, 2019). Inevitably, this leads to student-based active learning being sacrificed for TTM in classrooms to ensure syllabus content is covered prior to public examinations. TTM learning only takes place inside the classroom through lecture-based pedagogy, which encourages student dependency and superficial understanding, and fails to encourage reflection and self-direction (Engelbrecht, 2001). According to a news article in SCMP (2018), traditional pedagogy is still often used in schools in Hong Kong.

Kember and Wang (2016) identified that Chinese students have a propensity for rote learning. In their research, they concluded that Chinese students believe the use of rote learning is a means to achieve understanding as it facilitates remembering information. Benhamin and Bjork (2000) defined rote learning as a repeated rehearsal of verbal material. It is a type of passive learning which will not lead to new knowledge in the memory but will be easily forgotten after the exams (Cheng, Hung and Wan, 2016). The process of rote learning fixes the information in the memory through sheer repetition. Although research on rote memorisation has shown that a prolonged period of repetitive rote memorisation may lead to improvements in verbal/episodic memory **(**Iqbal and Ahmad, 2015). However, it is generally not considered to be a favoured learning strategy.

2.8 Roles of Liberal Studies Teachers in PBL Classrooms

According to Hung, Hwang and Huang (2012), the PBL method requires students to become responsible for their own learning. Under the PBL approach, the teacher is a facilitator of students' learning, and their interventions should diminish as students progressively take on the responsibility for their own learning processes. This role is critical, as the facilitator must continually monitor the discussion selecting and implementing appropriate strategies as needed.

As students become more experienced with PBL, facilitators can reduce their scaffolding until finally, the students adopt much of their questioning role (Barrows, 2006).

Scaffolding represents one means of supporting learners in a PBL environment. The Zone of Proximal Development (ZPD) concept was developed by Soviet psychologist and social constructivist Lev Vygotsky. Vygotsky (1978) used ZPD to describe this process. The ZPD measures the distance between what a learner can learn and a proximal level that they might attain through the guidance of an expert. Saye and Brush (2002, p.82) conceptualised soft scaffolds as "dynamic," which includes the timely support teachers provide as they "continuously diagnose the understandings of learners". Teachers provide scaffolds in the form of handouts and discussions during the PBL process. These scaffolds help students perform various inquiry-related tasks such as searching for relevant information, providing details in their writing, and brainstorming with their group. Within PBL, teachers can use scaffolds to accomplish four important goals: 1) initiating students' inquiry; 2) maintaining students' engagement; 3) aiding learners with concept integration and addressing misconceptions; and 4) promoting reflective thinking (Ertmer, 2006), which helps to transform implicit knowledge into meaningful understanding. These goals align with the expectation of the LS curriculum.

As noted above, successful implementation of the PBL approach requires teachers to assume a guiding role and simultaneously attend to many different aspects of the learning environment (Brush and Saye, 2000). This leads to teachers in student-centred classrooms tend to have a broader set of management responsibilities than teachers in traditional classrooms (Mergendoller and Thomas, 2005).

2.9 Effectiveness of PBL on Student Engagement

PBL uses various methods such as student-student collaboration, student-centred, and SDL to engage students actively (Yoshikawa and Bartholomew, 2017). An important aspect of engaging students is their ability to practice self-regulated or lifelong learning behaviours to define what to learn and to effectively use the time and resource management needed to learn it (Smith et al. 2005). Under PBL, it is up to the students to derive the key issues of the problems they face, define

their knowledge gaps, and pursue and acquire the missing knowledge. Wisdom in the process of PBL is that no one has special authority over the use of knowledge (Wang et al. 2001). Therefore, the students can take turns to play different roles as a group member, teacher, critical thinker, or learner. This execution also provides the best opportunity for the students to keep higher order thinking as participants in PBL ought to maintain their open-mindedness to accept different challenges to their ideas (Wang, 2018).

Wang (2018) claimed that intrinsic motivation occurs when students work on a task, motivated by their own interests, challenges, or sense of satisfaction. However, changing the current practice into student-oriented teaching practice will challenge not only the existing values and beliefs of many teachers, but also the continuing prioritisation of examination success required by the highly competitive Hong Kong secondary education system (Chen and Day, 2014). Teachers and students in the school, this research study is based on holding the same belief that studying is to pass examinations and enter university rather than a way to gain knowledge. According to Abraham et al., (2012) and Burch, Sikakana, Yeld, Seggie and Schmidt (2007), evidence from studies have suggested that poor performance in the subjects at the senior secondary school level could be reduced to the barest minimum with the implementation of PBL.

2.10 Collaborative Learning under PBL

Students working together do not only construct their own understanding of issues but also build knowledge across disciplines and beyond the perspectives of traditional disciplines (Barrett, 2005). Retnowati, Ayres, and Sweller (2017) found that various collaborative strategies involving students working together had significant academic, social, and psychological benefits over students who worked individually. According to the CDC, the PBL pedagogy of teachers is expected to transfer their understanding and build up their own concepts and perspectives. However, schools in HK are known for their competitiveness (Lam et al. 2004). There are at least 3 examinations every academic year in Hong Kong schools and student's relative ranking in the class is written in the school report cards. According to Lam et al. (2004), competitiveness in the classroom encourages students to prioritise achieving high grades in examinations, so students are more accustomed to proving their abilities in classroom settings. Such a competitive environment

also exists in the school where this study took place. The competitive environment makes it difficult for students to share knowledge (Bender, 2012).

Advocates of PBL argue that this approach enhances problem solving, critical thinking and promotes shared knowledge construction (Schalkwyk and D'Amato, 2015). Since learning motivation is measured in terms of student interaction. PBL requires collaboration in groups, which helps students to identify their own strengths and weaknesses and results in self-awareness of their potential and areas to improve. Furthermore, collaborative problem-solving groups are a key feature of PBL. In short, ways to establish effective collaborative learning is a key feature in LS as it is an irreplaceable strategy to enhance knowledge building. PBL is a form of collaborative learning (Bender, 2012). In PBL, students collaborate to study the issue of the problem as they strike to create a viable solution (Dieng, 2000).

2.11 Self-directed Learning

SDL refers to the goal-dimension towards lifelong learning (Rodríguez and Cano, 2006). Socrates (470-399BC) claimed that wisdom begins in wonder (Cooper, 2012). In recent years "zelfsturing" has been the subject of much discussion in Dutch education. According to Thijs, Fisser, and van der Hoeven (2014) it is defined as the ability in self-management that students will need in the future and is a characteristic of learning processes in which students have a relatively large input and responsibility. In educational practice, this term is often used to refer to both self-direction and self-regulation. A self-directed learner is a student who takes responsibility of, and for, his or her own learning. They take control and apply self-determination to learn what they view as imperative for themselves (Toit-Brits and Zyl, 2017).

As a student-centred means of learning, PBL focuses on active learning and SDL (Zheng et al. 2015); hence, SDL is an important component in the PBL process. Under PBL, students learn to become independent and responsible learners and have control of their learning tasks through the development of SDL as well as self-regulated learning skills. PBL learning takes place both inside and outside the classroom. Students learning under the PBL approach must spend extra time

outside the classroom to conduct SDL, both individually and with groupmates, to complete the required tasks to solve the problems.

As a central component of PBL, SDL can become a significant source of problems when it is not carefully considered. Some problems arise from the "complex nature of self-direction" that is "evident in the strikingly different approaches adopted" by different students (Evenson, 2000, p.294). This may cause conflicts among team members during facilitated group activities. Hmelo and Lin (2000) argued that the closer the PBL curriculum is designed to be near the student-centred end of the spectrum, more motivation there is for SDL. Most of the students vary in their background, knowledge, experience, and learning abilities. Siaw (2000) argues that self-directed activities embedded in every PBL phase suit students' diverse learning needs. Blumberg (2000) identifies four key components for SDL: 1) students need to be able to identify what needs to be learnt; 2) students should be able to devise a plan to learn, especially the time management skills to complete the self-learning tasks efficiently; 3) students should know where to look for resources, how to evaluate the appropriateness of resources; 4) students need to constantly reflect on their own SDL skills and seek to continually improve themselves as self-directed learners. All these components are vital for the PBL process and the teachers in this research study will be guided to facilitate the students to engage in self-directed learning, which will be explained later.

2.12 Summary

The literature review has identified several studies related to PBL, TTM, student engagement, and Chinese students' learning approaches. The literature also supports the impact of PBL on teaching and learning. This research study is to illustrate the importance of using the PBL approach to motivate students' engagement in learning.

2.13 The Research Questions

The research questions adopted in this study originated from the professional experience of the researcher and were further refined through the review of the literature.

The research questions are as follows:

1. What effects does a PBL approach have on the teaching style of LS teachers in Hong Kong?
2. How does the PBL approach affect students' engagement in learning LS in Hong Kong?
3. How does PBL influence the knowledge gained by students through collaborative learning in Hong Kong?

CHAPTER THREE
THE RESEARCH DESIGN

3.1 Introduction

The research methodology describes how the research study was set out to explore the answers to the research questions, the design of the study and provides a rationale for adopting a mixed-method case study approach to collect data for analysis. The data for this research study was collected in two phases, namely qualitative data (Phase I) and quantitative data (Phase II).

Interviews and questionnaires are often used together in educational research studies (Brookhart and Durkin, 2003; Lai and Waltman, 2008). I used both methods, as questionnaires can provide evidence amongst a large population, whereas interview data helps to gather more in-depth insights into participant thoughts and actions (Kendall, 2008). Ethical issues are discussed with reference to the case study and the pilot study, which was carried out to test the suitability of the research design.

3.2 Research Methodology: A Single-Case Study Approach

The research design for this study is an interpretive case study. Interpretive researchers such as Chronister et al. (2014) and Wood, Farner and Goodall (2016) focus was on discovering and understanding how people perceive and experience the world around them (Rubin and Babbie, 2015). A case study is commonly used for social and life science areas (Gustafsson, 2017). Researchers with more positivist views are based on the "assumption that features of the social environment constitute an independent reality and are relatively constant across time and settings" (Gall et al. 2003, p.28). According to the interpretivist paradigm, the positivist scientific study of social reality is impossible because all social activities involve beliefs, values, intentions, and goals that are invested in activities to give them meanings. But to understand the meanings assigned to activities requires that the meanings be placed within a social context.

Elliott and Lukes (2008) argue that a case study is a genre that aims to capture the complexity of relationships, beliefs, and attitudes within a bounded unit, using different forms of data collection, and is likely to explore more than one perspective. The case study method enables the researcher to closely examine the data within a specific context. According to Merriam (1998), a case study is particularistic and descriptive and thus it is relevant for the purpose of this study. This research study is a single case: the focus is only on Year 11 students from a particular school. Yin (2013) and Denscombe (2010) both agree that the case study approach is appropriate for social science research as it helps to understand complex social phenomena. Zainal (2003) argued that in situations where there are no other cases available for replication, the researcher could adopt the single-case design. According to Yin (2013), the case study approach is appropriate for research that investigates the questions on the relationship between phenomena and context. The research questions are precisely about the relationship between teaching style and student engagement in specific content.

3.3. The setting of the study

This section explains the selection of the school, students, teachers, and the procedures adopted for PBL classes and the TTM class for this research study. The main research fieldwork began in the second semester after the Easter break and lasted for 2 months. Data were collected about students' and teachers' experiences in 24 lessons, each lasting 60 minutes.

3.3.1 Selection of the School

As mentioned earlier, the school in this case study is a subsidised secondary school in HK that has great flexibility in deploying resources and designing its own curriculum but within the national curriculum content. The Principal of this school has put considerable effort into school reform. Although the national curriculum is examination oriented, the Principal supports creative ways of teaching. In this school, teachers usually undertake 12 to 18 teaching hours per week and every Friday they need to take part in a staff development session, which involves co-planning for lesson preparation, sharing sessions, team building activities or workshops.

3.3.2 Selection of sample - Students

The main purpose of selecting Year 11 (secondary 5) students for this study is because students at this age (16-17 years old) are more willing to experience different approaches to learning compared to Year 12 (secondary 6) students, who are more focused on grades due to the public examination pressure. HK has a very strong examination oriented culture (Coniam and Falvey, 2016). Students in this school are passive in the classroom but display good subject-matter understanding and demonstrate strong academic performance. Participants' academic performance in the form of the average percentage of all subjects can be found in Appendix 1.

There are 5 classes in each year group of students with students of mixed ability in each class. Out of the 5 classes, 3 were selected for PBL teaching, 1 class for TTM and 1 for the pilot study, which will be further discussed in section 3.4.1. I led 2 classes and there were not any criteria in selecting these classes other than that I was teaching them LS; one class I chose for PBL and the other one for TTM to have a better understanding of the influence of PBL on students. PBL classes were given more opportunities to interact with the teacher and peers, whereas the TTM class discouraged student-student interactions in favour of a traditional pedagogic style (Wong and Day 2008). Saleh, Lazonder and Jong (2005) investigated the performance level of students in homogeneous and heterogeneous ability groups. Their study showed no difference between scores of high ability students in two different types of groups. However, low ability students scored higher when learning in mixed ability groups and were more motivated to learn in mixed-ability group learning conditions. Mixed ability grouping was applied for this research study so that low achievers could be motivated during group discussions.

For PBL classes, before engaging students in the study, their previous examination result of LS was taken into account to allow mixed ability grouping. Table 1 shows the allocation of students for this research study. In each PBL class, which consists of 29 or 31 students, students were split into 5 groups, each group consisting of 5 to 6 students of mixed ability in LS. Students' LS abilities were labelled based on their scores in previous LS examinations as shown in Table 2: those scoring 0-49 marks were labelled low achievers, 50-69 were labelled as middle achievers, and those scoring 70-100 as high achievers. I arranged Class A and B for PBL as both teachers Kael and

Wera (name of the teachers is pseudonymised**)** have attended PBL workshops with The University of Hong Kong and Class E participated in the pilot study.

Classes	No. of Students	No. of Groups per Class	No. of Students in each Group	Teachers
Class A - PBL A	29	5	5 to 6	Wera
Class B - PBL B	30	5	6	Kael
Class C - PBL C	31	5	6	Researcher
Class D – TTM D	30	Nil	Nil	Researcher
Class E – Pilot Study	27	Nil	Nil	Zoe

Table 1: Research Sample

Marks	Students Abilities	No. of students
0 - 49	Low Achievers (L)	12
50 - 69	Middle Achievers (M)	60
70 - 100	High Achievers	18

Table 2: Student Abilities in LS

Having an academically mixed ability group of students provides a deeper understanding of the impact of PBL on student engagement (Yin, 2009). Murphy et al. (2005) argues that a collaborative learning environment, instead of a passive learning environment, helps students learn more actively and effectively. Collaboration is all about cooperation and not competition, unlike individual learning, where the weaker students are often left behind.

3.3.3 Selection of Sample - Teachers

Having a piece of good subject knowledge and the ability to adapt PBL is vital for all teachers involved in this research study as they are key factors in influencing the lessons and motivating the students to learn. There are 4 teachers teaching Year 11 LS. Two teachers were invited to join this study and no objection was recorded. The main reason for their selection was that they were initially teaching LS to those classes and have good knowledge of the PBL approach. Wera and

Kael are both experienced and professionally trained teachers holding a qualification of Postgraduate Diploma in Education and Master of Education (majoring in LS). Both teachers often attend the professional development programmes offered by COTAP on teaching and learning. COTAP offers regular training workshops on pedagogy, such as new and effective ways of teaching LS to enhance critical thinking in students.

Wera and Kael were invited to teachers' semi-structured interview and 10 LS teachers from the same school were invited to complete a teacher's questionnaire, including Wera and Kael. All the teachers involved in this research study were working under my supervision. To ensure they did not feel obliged to participate, I assured them they could withdraw from the study at any time before the data is analysed.

3.3.4 Selection of the Subject

The main reason to consider LS for this research was that the subject emphasizes learning through inquiry, interdisciplinary learning, and scaffolder instructions, which fits the PBL approach. Furthermore, I teach LS, which means I am thoroughly familiar with the subject and content knowledge.

3.3.5 Problem Statements

A typical series of stages in a PBL approach was given by Barrows and Tamblyn (1980). These were later modified by Hung (2006), who proposed a PBL design process based on Hung's 3C3R problem design model consisting of core components and processing components. I adopted Hung's 3C3R design model, as shown in Table 3, in designing the problem statements for this research study. The main goal of adopting the 3C3R design model was to facilitate the development of problem statements that target specified outcomes and promote students' understanding of content knowledge within a discipline, as well as the development of students' problem-solving and SDL skills. When designing a problem statement, consideration was given to students' prior knowledge and how the problem appropriately engages students in meaningful learning of the intended content. Considering the learners' needs is a critical element of the 3C3R.

It ensures the difficulty level of the problem statement is appropriate for the targeted students. The 4 problem statements that framed the delivery of PBL LS lessons in this research study were validated with the help of Hung's 3C3R problem design model. Samples of problem statements can be found in appendices (Appendices 2 to 3). According to Hung (2006), the level of difficulty of the problem statement is the main concern in PBL. If the problem statement contains too many unknowns, students have to rely on assumptions and guessing and these assumptions reduce their confidence level in solving the problem successfully. Hence, the information in each problem statement was authentic and related to students' daily life.

Components	Functions
Content	Covering curriculum contents
Context	Appropriateness of problem context
Connection	Forming a conceptual framework about the topic
Researching	Guiding the research process to acquire intended content
Reasoning	Adjusting the level and information appropriate to the students
Reflecting	Cultivating the students' mindset of self-directed and life-long learning

Table 3: Design Model [Adopted from The 3C3R Model: A Conceptual Framework for Designing Problems in PBL (Hung, 2006)]

3.3.6 Selection of Classes using TTM

The selection of the TTM class was from the same population of the main study to provide the necessary baseline for comparison (Xiao, 2016). This helped to estimate what would have happened without the intervention (Tash, 2006). The lessons for TTM class were conducted with less room for student activity (Kember, 2009; Lammers and Murphy, 2002). The teacher of the TTM class mainly used either PowerPoint or textbooks during the LS lessons. The contents and scheme of work of the TTM class were the same but applied a different teaching style. No flowchart or prompting questions were provided for the students of the TTM class. Throughout the whole process, opportunities for students to work in groups or to discuss were extremely minimal and the lessons were mainly delivered as lectures. Upon completion of each week,

homework was distributed to perceive how much the students understood. The PBL approach was applied to teach TTM class after completing this research study to ensure fair treatment.

3.3.7 Problem-based Learning Procedures

The 3 PBL classes applied PBL as a pedagogic approach, which focuses on experiential learning organised around the investigation, explanation, and resolution of meaningful problems (Torp and Saye, 2002). At the start of the LS lesson, students were given a problem statement. Prior to the lesson, teachers made it noticeably clear to PBL students that they would be working in groups and should respect one another's views. They were welcomed to challenge their classmates but in a respectful constructive way. As Walker et al. (2015) note, when students are grouped to discuss problem statements, there is more conflict than when they work on the problems individually. Table 4 shows the scheme of work for PBL classes.

Lessons	Explanation
Week 1	Introduction to the research and the rundown of coming lessons A Brief introduction to the module Hong Kong Today
Week 2	Problem Statement 1: Hong Kong an Ideal city to live
Week 3	Problem Statement 2: Electronic Road Pricing
Week 4	Problem Statement 3: Globalization
Week 5	Problem Statement 4: Standard Working Hour
Week 6	Presentation

Table 4: Scheme of Work for PBL Classes

The first week was used to introduce the problem statement and the concepts as students must first recognise the existence of the problem and then realise that their existing understandings are adequate for creating a solution before, they are fully ready to learn difficult concepts (Lehrer and Schauble, 2003; Strike and Posner, 1992). The teacher's main role in the PBL classes was to ensure equal participation and a high level of interaction among the group members. When students faced problems, the teachers were encouraged to engage the students through scaffolding to ensure they

realised what they did not understand rather than giving answers directly. The weekly lesson plan of 4 lessons per week for each problem statement is shown below in Table 5.

Lesson 1	Introduction to PBL method and watching news clip related to the Problem Statement
Lesson 2	Presenting the Problem Statement and Discussion
Lesson 3	Solving the Problem Statement
Lesson 4	Group Presentation

Table 5: Lesson Plan for Weekly Topics

3.4 Research Methods

This research study is a single case study. I adopted a mixed method approach for this study. The rationale for combining qualitative and quantitative approaches is to enhance the overall validity of the study as it allows the emergence of confirmatory and exploratory questions and provides more robust inferences that confirm or complement each other (Teddlie and Tashakkori, 2003). In this research study I used qualitative methods; semi-structured interviews, a focus group and field notes to help me to answer "how" questions (Yin, 2013) and a quantitative approach, which focuses on gathering numerical data and generalizing it to explain a particular phenomenon and to understand if changes in one variable affect the other (Earle, 2010).

3.4.1 Pilot Study

"A pilot study is a small-scale version in preparation for a major study" (Polit, Beck, and Hungler, 2004, p.467). The pilot study helped me to identify unanticipated problems and check design suitability (Gay and Airasian, 2000). It gave me a warning regarding weaknesses and suggestions for improvements in the main research study. For instance, problem statements should not be too easy or difficult for the students and the questionnaire should be user-friendly. The pilot study was conducted 2 months before the main study to allow enough time to make amendments. I conducted the pilot study with Class E of Year 11. The students and the LS teacher of Class E were not involved in the main research study. This is in line with Mallinson, Childs and Herk (2017). They

argued that the participants selected for the pilot study should come from the same population as the main study participants will be selected from, but the same individuals should not be included in the major study. The concern is that they had already been exposed to the intervention and, therefore, may respond differently from those who have not previously had a similar experience. As for the main study, consent forms were sent home for parents' signature, as students were under the age of 18. No refusal was recorded for the pilot study. The students and the teacher involved in the pilot study were informed that their privacy would be respected, and their anonymity preserved.

(1) Pilot Problem Statement

I worked collaboratively with the 2 teachers involved in the main research study and the one involved in the pilot study in designing the teaching materials and discussing the lesson plans. Two students from Class E volunteered to work on pilot problem statements. The problem statements were modified accordingly based on the performance of the students involved in the pilot study and the feedback from the 3 teachers involved in this research study. More guiding questions were added to cater to the needs of different students, as students vary in terms of academic ability. Figure 2 shows guiding questions added to problem statement 2.

Thinking directions

- What are the conditions of an ideal city to live?
- What are the concerns of different people about the quality of life?
- Currently, can Hong Kong satisfy people's expectations of improving the quality of life in various aspects?
- Can surveys about the liveability of global cities reflect the actual situation of Hong Kong?

Figure 2: Guiding questions to problem statement: Is HK an ideal city to live?

Before the study began, I arranged meetings to discuss the planning of the lessons and training sessions on how to use PBL statements, to ensure that all the teachers shared a similar understanding of the rationale of this research study. Meetings were held before and after every lesson with the other 2 PBL teachers to ensure they are consistent, to discuss the impact of using

the PBL approach, related problems, and solutions, what they observed and the problems they anticipated.

(2) Pilot Interview

The pilot interview aimed to answer the research questions. The pilot interview was conducted with 2 students from Class E of Year 11 and their LS teacher. Burns and Grove (2005) and Polit and Beck (2004) made no specific recommendation on pilot study sample size. These 2 students were chosen based on their interest in being studied and were fully informed about the research.

The teacher pilot interview did not require any modification. The initial set of student interview questions was subsequently modified based on the responses gathered from the pilots. Some of the wordings of the original questions were revised to make them clearer to the interviewees, while others were eliminated and replaced by new questions. The original set of interview questions can be found in Appendix 7. Appendix 8 shows the final modified version. From the pilot interviews, I identified that the order of the student interview questions was too rigid and might interrupt the respondents' narration of their experiences during the PBL group process. Hence, I decided that after the first question, I would determine which one to ask next depending on the response and direction of the respondents' answers. Essentially, each student interview had followed the same set of questions but in a different sequence. Table 6 shows information about pilot study participants.

Name	Gender	Class	Period
Student: Ron	M	E	6 - 10 March, 17
Student: Kareena	F	E	6 – 10 March, 17
Teacher: Kumar	M	E	13 – 17 March, 17

Table 6: Pilot Study Participants

(3) Pilot Questionnaire

A pilot study is essential when creating a questionnaire (Lowing, 2011). Wellington (2015, p.196) states that "A pilot questionnaire is a key stage in the design and construction". The pilot questionnaire was conducted with 10 students from Class E of Year 11 and their LS teacher. Burns and Grove (2005) and Polit and Beck (2004) made no specific recommendation on the sample size of a pilot study. The students and the teacher voluntarily participated in the pilot study and were fully informed about the research. The initial set of student questionnaire questions was subsequently modified based on the responses gathered from the pilots. Some of the wording of the original questions was revised to make them clearer for the students, while others were eliminated and replaced by new questions. The original set of questions can be found in appendix 7 and appendix 8 shows the final modified version. No changes were made to the teacher questionnaire.

3.4.2 Phase I: Qualitative Study

Denzin and Lincoln (2005, p.3) offer a comprehensive definition of qualitative research, as follows.

> *"Qualitative research consists of a set of interpretive, material practices that make the world visible. These practices transform the world into a series of representations, including field notes, interviews, conversations, photographs, recordings and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world".*

In Phase I, semi-structured interviews with students and teachers, a focus group with students and field notes were applied. The idea that "different representations of constructions lead to different outcomes, different ways of expressing experience" (Lincoln and Guba, 2013, p. 48) has allowed more flexibility within research methods and expectations of outcomes. The research design enabled me to collect data from multiple sources, which "improves the quality of the data collected and the accuracy of the researcher's interpretations" (Fraenkel, Wallen and Hyun, 2012, p. 517).

(1) Semi-Structured Interviews

The semi-structured interviews aimed to ascertain participants' perspectives regarding experience pertaining to the research topic. Semi-structured interviews employ a relatively detailed discussion when there is sufficient objective knowledge about an experience or phenomenon, but the subjective knowledge is lacking (Gubrium et al. 2012). Semi-structured interviews in this research study were semi-standardised. They were conducted using an interview schedule of primary questions, followed by sub-questions. It was important that these questions are open-ended and formulated to elicit unstructured responses and generate discussion. Questions were asked in the same way and in a systematic order, but the questions were semi-structured, which allowed me the freedom to diverge slightly from the script (Irvine, Drew, and Sainsbury, 2012). Questions were presented in a logical, chronological order (Leech, 2002) such that the interview could move from mild and non-threatening questions to more complex and sensitive questions as the interview proceeds. To obtain rich data, follow up questions were included (Meho, 2006).

Interview length is influenced by how an interviewer interacts and communicates during the process. A list of questions was prepared, which could be found in Appendix 5 and 6 but the list was not strictly followed for semi-structured interviews and focus group as additional questions were added depending on the responses of the interviewee. Hence, the interview length varied using the same schedule depending on the responses from the interviewees (Olson and Peytchev, 2007).

Burns (2000) identified several advantages of interviewing as a data collection method, of which there are areas of particular importance to this research: flexibility, probing, and suitability of complex topics. Interviewing provides great flexibility that allows the interviewer to respond to the situation by repeating questions or clarifying meaning for the interviewees. However, on the other hand, participants might feel inhibited when asked to respond to sensitive questions face-to-face. Hence, they would give more socially desirable and conventional answers. Brooks et al. (2014, p.106) remarked that "power relations are difficult to avoid in all research settings". To overcome the power imbalance, Cohen, Manion and Morrison (2017) suggest putting interviewees

at ease by making the interview enjoyable and giving them ownership. I allowed interviewees to have ownership during the interview by encouraging them to ask questions or make suggestions.

To avoid being biased, the interviews and focus group were conducted with caution. I spoke to the interviewees as if I was talking to them for the first time and I did not know the impact of the PBL approach on student engagement. DeLyser (2011) notes that greater familiarity can lead to loss of objectivity and there is a risk of the researcher making assumptions based on their prior knowledge or experiences. Being an insider researcher with a powerful position gives rise to many questions such as unwittingly shaping the research to justify my own views.

All the interviews with students, teachers, and a focus group of 3 students were carried out at a time and venue convenient and familiar to the interviewer and interviewee (Cresswell, 2013). The room setup was simple: I had my laptop, a notebook, pen, and my Digital Audio Recorder (iPod) to capture everything that both the interviewer (me) and the interviewees said. The interviews and focus group were recorded using an iPod and all electronic devices and files were password protected (Anderson and Corneli, 2017). All the interviews and the focus group were recorded with the consent of the participants. A consent form was sent home for the students and given to the teachers personally at school stating that the conversation will be recorded, and verbal permission was requested prior to the interview. Transcripts were then produced using Microsoft Word. The ethnicity of all the participants is Chinese. Since Cantonese is the mother tongue of all the students and the teachers, interviews and focus group in this research study were all conducted in Cantonese and subsequently translated into English by the researcher, who is a native Cantonese speaker. Once the interviews and focus group were transcribed, the students and teachers were invited to read the transcript to ensure it was an accurate reflection of the conversations and no feedback or objection was recorded.

In addition to 2 PBL teachers, 6 PBL students were invited for an interview on a voluntary basis. Due to the availability of the students; 3 students volunteered for the focus group and the other 3 for an interview. Table 7 provides information about the interview and focus group participants. To respect the participant's privacy, pseudonyms were used instead of real names.

Data Collection Method	Pseudonyms	Gender	Class	LS Ability of the Student
Teacher Interview				
	Wera	F	A	
	Kael	M	B	
Student Interview				
	Simone	F	C	H
	Uma	F	A	M
	Yash	M	A	L
Focus Group				
	Peter	M	B	M
	James	M	B	L
	Mel	F	C	M

Table 7: Interview and Focus Group Participants

Overall a semi-structured interview approach allows more flexibility in collecting the data by allowing changes of sequence and forms of questions to follow up on answers given by the interviewee (Brinkmann and Kvale, 2015), in contrast to a structured interview where the interviewer has no opportunity to explore any topics that were not anticipated (Dunn, 2005).

(a) Students' Interviews

The purpose of interviewing the students was to understand the influence of the PBL approach on their performance in LS lessons and to provide a more detailed understanding of students' engagement in PBL. Students' interviews were conducted in a conference room, which students often use for activities and club meetings. Interviews were arranged after week 6 upon the completion of teaching and were conducted 2 weeks depending on the availability of the students. Each student interview required 45 minutes as it was necessary to provide the opportunity for a discussion between interviewer and interviewee, which "moves beyond surface talk to a rich discussion of thoughts and feelings" (Miles and Huberman, 1994, p.80).

To elicit an in-depth response from the research participants, each interview was sufficiently long for rapport to be established and allowed participants the freedom to recall and respond from their perspectives. During the interviews, follow up questions were asked to further investigate students' in-depth opinions on the questions. Students responded freely to the questions and were willing to share their experiences. Special attention was paid to ask questions which were not biased and were open-ended. For example, "How is PBL different from other learning experiences?" "Do you prefer PBL or TTM and why?" Probing questions but without interfering with the response of the interviewee allowed me to obtain in-depth information by avoiding any misunderstandings or making a fair assessment of what students believed. Open-ended questions also led to unexpected or unanticipated answers (Cohen, et al. 2017). In addition, different types of questions were considered (Kvale, 2008): introducing questions, follow-up questions, probing questions, specifying the questions, silence, and interpreting questions. For example, I smiled and used gestures to encourage students to talk more and to make students comfortable to share information.

(b) Focus Group

A focus group interview provides access comparisons that focus group participants make between their experiences. Kamberelis and Dimitriadis (2005) believe that a focus group is more valued by participants as it provides greater opportunity to participants to have some ownership, but the researcher must make sure that the participants are not becoming stressed (Halcomb et al. 2007) as people are more likely to judge each other's reasons for holding certain views (Bryman, 2012). During the focus group, students were more willing to share and argue to present their viewpoints, which allowed me to understand better, but I had to ensure the argument was healthy and not causing any distress.

The focus group interview was held in the same manner and at the same venue as the semi-structured interviews with students, except that it lasted for 1.5 hours, as 3 students were involved. The optimum number of participants for a focus group may vary. Krueger and Casey (2014) suggest a maximum of eight participants, as smaller groups show greater potential for discussion.

Students in the focus group shared various and different viewpoints on whether LS should be taught using the PBL approach. Their arguments provided me with substantial data for the research. However, in a focus group, the researcher has less control over proceedings compared to an individual interview as more participants speak at the same time. Thus, it was also difficult to transcribe the data collected. The conversations were recorded to make it easier to transcribe and analyse the data collected.

(c) Teachers Interviews

Interviews with 2 teachers were held separately upon completion of all PBL sessions, which was week 6. The time slot for each interview was selected carefully to ensure the teacher did not have a lesson for 2 hours as that allowed enough time for the interview. Elwood and Martin (2000) and Sin (2003) argue that location matters when interviewing; they believe that interviewing outside the classroom or office diminishes the power imbalance. To overcome the power threat, I decided to interview the teachers in the staff common room where we generally meet for tea or lunch during break time. The room is seldom occupied during lessons, but I still reserved the room to avoid any disturbance. Cresswell (2012) also highlighted the significance of qualitative research taking place in the natural setting. Furthermore, according to Brinkmann and Kvale (2015), interviews can be more collaborative where the researcher and the interviewee have equality in questioning, interpreting, and reporting. During the interview, I encouraged the teachers to talk or even ask and give suggestions such that they have ownership of the discussion and it also helped me to have a better understanding of what was said.

(2) Field Notes

In educational research, field notes are detailed notes taken by the researcher in educational settings (Wallen and Fraenkel, 2013). In this research study, they formed written accounts of what I observed, heard, saw, and experienced. Bailey (2007) suggests that field notes develop from an analytic process. The researcher must mentally attempt to capture a situation where it is not appropriate to be seen taking notes such as during a casual conversation over a coffee break or while having lunch. However, not to record immediately also has the danger of failing to note a

situation in the belief that it will always be recalled later. Hence, throughout the study, all the important discussions or conversations I had with my students during or after the lessons were recorded immediately and the same was applied to the conversation with the teachers. Brief notes were written after hearing or seeing something interesting, which were later detailed with the venue, time, and more description. For instance, a student in the TTM class was distracting the one sitting in front of him. Since I was remarkably familiar with the setting and the students, I might have taken them for granted, as I have never seen them with a critical eye. Hence, after the lesson, I conversed with some of the students asking why they behaved in that way. Field notes allowed me to record the interpretation of what was happening in the classroom.

Field notes were taken during the planning, preparation and implementation of the lessons and teaching materials. Any amendments made to the teaching materials were recorded in the field notes. Furthermore, meetings held with the other two teachers in the process of their PBL lessons or my conversations with other LS teachers during break time were also recorded in the field notes. For instance, having conversations about PBL with other LS teachers while in the corridor or in the staff room allowed me to collect data outside the classroom context. For my own convenience, field notes were mostly recorded in my notebook. I chose a diary-writing format where events were recorded with date and time. I recorded the name and class of the students as well. The purpose of recording the name of the students was to assist me in analysing the viewpoints of students from PBL and TTM classes. Butler (2008) described note taking as a document of scientific research, where hypotheses, methods, data, observations, and planning are distinct and systematically laid out and field notes serve as a reflective teaching and learning diary. The main difference here compared to a diary was that field notes are an interpretative act where the focus is on others, what they said or felt, not on my viewpoints, reflections, or concerns. To avoid any breach of confidentiality, field notes were protected in locked cabinets (Anderson and Corneli, 2017).

3.4.3 Phase II: Quantitative Research

In Phase II, quantitative research (questionnaire) was conducted. Quantitative research can be defined simply by the inclusion of a measurement factor (Bryman 2012). Quantitative research is

based on the notion that there is only one social reality. The information held within the database is factual and is analysed numerically (Mcleod, 2008). The major purpose of this quantitative phase was to study the perspectives of a larger number of students. A total of 89 students and 10 teachers were involved in Phase II of this research study. Creswell (2013, p.375) described surveys as "an economical and efficient means of gathering a large amount of data". The data collected increased the understanding of the perspectives and experiences of a wider population. Quantitative research allowed quantitative answers to questions such as how many students found PBL useful and if there was any relationship between the implementation of PBL and student engagement and SDL.

(1) Questionnaire

Questionnaires were designed to generate data to have insights and conclusions of the study. It was imperative to cover the key areas in a short design, ensuring "brevity and clarity" (Wellington 2015, p.163), whilst being clearly presented. I wanted the questionnaires to be brief to attract a greater response from the students and the teachers on the PBL approach. Hence 2 sets of questionnaires were designed, one for students and the other for the teachers. It was essential to consider how the questionnaire would be analysed when drafting it (Wellington, 2015). Lowing, (2011) suggests avoiding controversial questions at the start of the questionnaire. It was important to start with simple questions. Lowing (2011) suggests creating a flow from general to specific themes. The themes applied to design the questionnaire will be explained later in this section.

In this research study, a Likert-type scale was used with a scale of 1 to 4 ranging from strongly agree (1), agree (2), disagree (3) to strongly disagree (4). Each response was assigned a point value and an individual's score was determined by adding the point values of all the statements (Gay, Mills and Airasian, 2009). Usually, there are 5 categories of responses ranging from 5=strongly agree to 1=strongly disagree with 3=neutral type of response (Jamieson, 2004). However, there is a debate among researchers concerning the optimum number of choices on a Likert-type scale. Some researchers prefer scales with 7 items or with an even number of response items (Cohen, Manion and Morrison, 2017). Guilford (1954) stated that the optimal number of categories is a matter of empirical determination depending upon the situation. However, Mattel and Jacoby (1971) determined that the reliability and validity of an instrument are not affected by the number

of scale points used for the items. In this research study, I excluded the neutral point to prompt the respondent to commit to a specific position (Brown, 2006) even if the respondent may not have a definite opinion. Using a mid-point item has been shown to affect the data (Garland, 1991). To avoid teachers and students feeling restricted by the rating scale comment box was provided at the end of each question.

Since the validity and reliability of the questionnaire could be threatened by bias, the questionnaire form does not require a name or any identifying mark except the participant's class (Kazi and Khalid, 2012). I ensured that students and teachers were clear about how each question should be answered and kept it simple, as seen in Figure 3 below.

Questionnaire

Rating scale: 1= Strongly Agree 2 = Agree 3 = Disagree 4 = Strongly Disagree

Please **circle** the most appropriate

	SA	A	D	SD
PBL is a more active way of learning than a traditional lesson	1	2	3	4

Figure 3: Snapshot of the questionnaire

(a) Students' Questionnaire

Fourteen questions were designed to relate to the themes generated from Kaur (2019) (i) Students Engagement in PBL Lessons, (ii) Student's concerns about the PBL approach and (iii) Teacher's concerns about the PBL approach. Table 8 shows how I categorised the questionnaire.

Questions	Themes
1. I Like PBL as a way of learning	Student Engagement in PBL lessons
2. PBL is a more active way of learning than a traditional lesson	
3. PBL stimulated my interest in learning LS	
4. PBL makes learning more fun	
5. I was active in the group	
6. I spoke more than the teacher	
7. The teacher helped to brainstorm	
8. I have a better understanding of the subject knowledge of LS when learning under the PBL approach	Student's concern about the PBL approach
9. PBL helped me to gain more subject knowledge of LS compared to traditional lesson	
10. I have to memorise less under PBL as understanding increases	
11. I prefer groups to be arranged by the teacher	
12. I prefer allowing students to choose groupmates	
13. Group dynamics are a barrier to my participation in the lesson	
14. The teacher acts as a facilitator	Teacher's concern about the PBL approach

Table 8: Categorisation of the Students' Questionnaire

I personally distributed, printed questionnaires to all 3 PBL classes during the lesson of last week. Students were given 15-20 minutes to complete the questionnaire unless they needed extra time. Questionnaires did not provide opportunities for discussion or give clarification of ambiguity (Wellington, 2015). Out of 90 questionnaires, 89 completed questionnaires were collected as 1 student was absent. None were void. All the questionnaires were collected on the same day.

Participants	No. of Questionnaires distributed	Number of Questionnaires Completed and Returned
Students from year 11 PBL classes	90	89

Table 9: Distribution of Students' Questionnaire

(b) Teachers' Questionnaire

For the teachers' questionnaire eight questions were designed also related to the themes generated from Kaur (2019) (i) Students' Engagement in PBL Lessons, (ii) Student's concerns about the PBL approach and (iii) Teacher's concerns about the PBL approach. Table 10 shows how I categorised the questions in the teachers' questionnaire.

Questions	Themes
1. Students are actively involved in class when learning under the PBL approach	Student Engagement in PBL lessons
2. The PBL approach helps students to gain more subject knowledge compared to TTM	Student's concern about the PBL approach
3. I prefer the PBL approach as a teaching pedagogy	Teacher's concern about the PBL approach
4. PBL is time consuming in terms of lesson preparation	
5. PBL is time consuming in terms of delivering a lesson	
6. PBL complies (in line with) with DSE curriculum	
7. PBL does not suit teaching HK Chinese students as they are reluctant to speak in class	
8. PBL leads to classroom management issues	

Table 10: Categorisation of the Teachers' Questionnaire

I personally distributed printed questionnaires to all 10 teachers upon the completion of this research study. Teachers were not required to provide any information about their identity in their

responses to ensure confidentiality. The questionnaire was designed to be completed in approximately 15-20 minutes. All the teachers completed the questionnaires and returned them to me personally within a week.

Participants	No. of Questionnaires distributed	Number of Questionnaires Completed and Returned
LS Teachers	10	10

Table 11: Distribution of Teacher Questionnaire

3.5 Overview of the Research Implementation Plan

The table below shows the 3 stages of this research study.

Stages	Duration	Instructional Design
Stage 1 – Preparation	Oct.,16 – Nov., 16	Designing of the questionnaire and problem statements
Stage 2 – Pilot Study	Mar., 17	Implementation of the pilot study and amendments
Stage 3 – Main Study Phase I Phase II	April 17 – June 17 June 1 – June 17 June 19 – June 30	Implementation of the main study Qualitative Data Collection Quantitative Data Collection

Table 12: Summary of the Research Design

3.6 Research Ethics Approval

Ethical issues should be dealt with properly to ensure the credibility of the research (Walford, 2005). Upon obtaining ethical clearance from Nottingham Trent University under the British Educational Research Association (Appendix 9), formal approval from the school Principal (Appendix 10), teachers (Appendix 11) and parents (Appendix 12) were obtained in writing to conduct the research. This study involved students under the age of 18. Before conducting the research, informed consent letters were sent home for parent's signature, providing full information about what the study would involve, and no objection was received from parents or students. Students had the right to withdraw their participation from this research study at any time

before analysis of the data by approaching their LS teacher or me. This was clearly stated in the consent form (Appendix 12). All participants were given an outline of the objectives of the study and were asked to sign the consent form, which provided a clear articulation of the purpose of the research study and the process in which the participants would be involved and how the data would be used. For instance, it was mentioned clearly that interviews would be recorded. Research participants' privacy was prioritised. The ethics behind the research and the scope of the study were explained to the students and the teachers before the interview and distribution of the questionnaire. Students were not required to provide their identity in their responses to ensure confidentiality. This helped to establish an atmosphere of trust and minimise possible harm.

The ethical concern is related to protecting rights and privacy (Pole and Morrison, 2003) by keeping the students, teachers, and the school anonymous and protecting all the data with passwords. All digital documents were secured with passwords and any form of hard copy such as questionnaires were always locked in the drawers. Since the research is integrated into the school's formal curriculum, it was made sure that the contents were in line with the DSE LS curriculum and extra materials were provided to the TTM class.

3.7 Data Analysis

The qualitative data analysis in this study reflected the guiding principles set forth by Braun and Clarke (2013) for discovering and interpreting meanings embedded in qualitative data. In addition to that, Statistical Package for the Social Sciences (SPSS) was applied to uncover powerful insights from Quantitative data.

3.7.1 Phase I: Qualitative Data Analysis

The procedure applied to transcribe the qualitative data will be discussed in this section followed by how qualitative data was analysed using codes and mixed inductive and deductive thematic analysis.

(1) Thematic analysis

Transcribing full interviews for individuals and a focus group was time consuming, especially as a translation from Cantonese was involved. On the other hand, it was vital to balance quality transcription and sufficient time for analysis (Silverman, 2013). I focused on the content rather than word to word translation of emotions displayed in the audio recorded file, e.g. mmmm.. and hmm were omitted (Kvale, 2008). The transcripts were read several times to ensure accuracy and avoid making assumptions related to the facts and what is known to me (Gerwirtz and Cribb, 2008). Transcription enabled a better understanding of the content and context of each interview and helped to identify some preliminary patterns (Hyde, Ryan and Woodside, 2012). Since the interviews were conducted in Cantonese and later translated into English, all interviewees, including focus group students, were invited to double-check the transcriptions to ensure the accuracy of the translation and the data collected. No objection was recorded.

A combination of inductive and deductive thematic analysis was applied to analyse the interviews, focus group and field notes data. Deductive approach is a kind can be considered a top-down approach where codes can be developed as strictly organizational tools, or they can be created from concepts drawn from the literature, from theory, or from propositions that the researcher has developed (Bingham and Witkowsky, 2022) whereas inductive approach provides an explanation of the data after analysing. Following traditions in qualitative research, data analysis was primarily inductive: categories and themes emerged mainly from the collected data (Marshall and Rossman, 1995; Strauss and Corbin, 1990). Interview and focus group transcripts were read a couple of times to generate salient themes and tentative categories. I constructed a coding system to analyse the data. During the process, various themes in the transcription and field notes were identified which were later organised into major themes. After certain recurring themes were identified, related PBL transcripts were examined to confirm coding and to reinforce the understanding of functions of silence in situated contexts. This was followed by assigning codes to the themes and coding relevant content according to the system of themes and codes. I repeated the coding procedures until all the transcriptions were coded. Braun and Clarke (2013) view Thematic Analysis as theoretically flexible as it does not require adherence to any theory of language or explanatory

meaning or framework. Braun and Clarke's (2013) six phases of Thematic Analysis were followed, as shown in Table 13.

Six phases of Thematic Analysis	Description
Familiarization with the data	I read the data again and again
Coding	I generated pithy labels for the data known as an analytic approach
Searching for themes	Themes were identified by the codes
Reviewing themes	Checked to make sure the themes are in relation to both the literature and the data
Defining and naming themes	Each theme was identified to construct a concise and informative name for each theme
Writing up	Finally, analytic narrative (predicted outcome) and data extracted

Table 13: The Six Phases of Thematic Analysis adopted from Braun and Clarke, 2006)

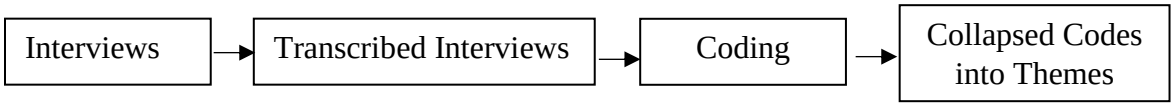

Figure 4: Process of data analysis adopted from Braun and Clarke, 2006)

Coding is the process of organising and sorting the data. Charmaz (2014) describes coding as the link between data collection and their explanation of meaning. Coding is an explanatory problem-solving technique, whereas themes are outcomes of coding (Saldana and Omasta, 2017). After reading the data, I generated a code that symbolises the data. These codes were later put into categories and formed themes. Some codes were Pre-Set Codes, which are created based on the prior knowledge of PBL and other Emergent Codes, which emerged from reading the transcription.

Table 14 below describes the themes which arose from the codes. They reflect the perspective of the students and the teachers towards learning LS under the PBL approach.

Codes	Themes
Activity based, open ended questions, Self-directed learning, Peer Pressure, Conformity, interpersonal, communication and research skills, overcome anxiety, shyness, Student centred, scaffolding, discussions, problem-based learning	Student Engagement under PBL
Curriculum content, time consuming, increase of workload of teachers and classroom management, feasibility	Teacher's concern teaching under PBL
Content knowledge, time consumed, competitive society, get answers immediately	Student's concern Learning under PBL

Table 14: Themes generated from codes

The Pre-set codes focuses on the deductive approach (Fleischmann and Ivens, 2019). A preliminary data analysis was conducted through the process of pre-set codes, which can be found in Table 15 during the data collection stage. The next stage of data analysis was to group the codes so that their categories relate to each other in some analytical way and help answer the research questions. This process provides initial answers to the research questions (Shutt, 2012).

Pre-Set Codes	Emergent Codes
Time Consuming (Hung, 2006)	Content Knowledge
Communication Skills (Cortazzi and Jun, 1996)	Feasibility
Collaborative Learning (Murphy et al, 2005 and Bender, 2012))	Outspoken
Problem Solving Skills (De Graff and Kolmos, 2003)	Off track
Engagement (Andrade and Evans, 2013)	Curriculum
Exam oriented (Ertmer, 2006)	Personality
Lifelong Learning (Smith et al, 2005)	Peer Pressure/ Conformity

Table 15: Pre-Set and Emergent Codes

In interpretive research, it is common that data analysis is carried out alongside data collection for emerging interpretations (Shutt, 2012). Throughout the research study, I noted potentially significant statements or incidents related to the research questions or the framework for data analysis (Merriam 1998). These statements and incidents were preliminarily coded into emergent categories, which explains an inductive approach where conclusion is generalised from the data. After reading the transcribed interviews, focus group and field notes, the information was then critically examined and carefully interpreted and synthesised to identify significant patterns that are relevant to the research questions. New questions that emerged from the initial interviews, focus group and field notes were coded with emerging categories. Sipe and Ghiso (2004) argue that coding is a judgment call because we perceive and interpret social life from different points of view.

For instance, the Pre-Set Code of Problem-Solving Skill came from Biber (2012), who argues that PBL adopts the idea of recognising the problems encountered, understanding the causes of such problems, solving the problems, and to eliminate possible problems in advance. However, many teachers consider PBL expensive, inefficient, and time-consuming as it takes more time for students to achieve the desired learning outcomes than traditional teaching (Hung, 2006). Hence it was predicted that teachers or students might find PBL time consuming (Steck et al. 2012). The Emergent Codes came from both students' and teachers' interviews and focus group. Table 16 shows some of the Emergent codes.

Statements from interviewees	Codes
Syllabus and public exam as PBL take too much time .... cannot catch with up the syllabus the workload is too heavy, but the proper distribution of workload among teachers may help	Time consuming
In the junior form, we cannot understand the questions properly as content knowledge is limited and in senior form DSE is all about issues and it is not possible to discuss each issue in class hence through group discussion using PBL, we may cover most of the curriculum contents.	Content knowledge
I am generally quiet and shy but seeing everyone talking in the group I don't want to look stupid and left out so I will contribute also even I am not confident with my answers.	Peer Pressure

Table 16: Emergent Codes

As mentioned above, data from all sources, including student and teacher interviews, focus group and field notes, were collected and analysed very carefully. I constantly kept an open mind to the emergence of new categories, which would be synthesised in relation to the research questions. This enabled me to gain a holistic understanding of the data and a comprehensive understanding of the influences the context had on the implementation of PBL.

3.7.2 Phase II: Quantitative Data Analysis

After the completion of the questionnaire Statistical Package for Social Science (SPSS) was applied to analyse the quantitative data.

(1) Statistical Package for Social Science (SPSS)

The responses to the questionnaire were added to SPSS database and then analysed. I used a 4-point Likert scale for all the questions and the numbers were added to the database. These responses were analysed using a quantitative approach. This research study involved a single independent variable, the PBL method versus the TTM and multiple dependent variables. Wellington (2015, p.266) argues that data should be presented "as fairly, clearly and coherently" as possible. The inclusion of statistical analysis in this research has been imperative to clearly portray the complexities of PBL and TTM. The data provided "objective scientific knowledge" (Burgess, Seimenski and Arthur 2006, p.54).

The reason for selecting SPSS for analysis of quantitative data is due to its similarities to excel spreadsheet and user friendliness. Furthermore, it allows the researcher to organize the data by assigning properties to different variables. After collecting all the questionnaires, I determined if the questionnaires collected were properly completed. My assistant at work assessed the accuracy of the data entry and observed that all data were inserted correctly. The assistant was informed that she was under an obligation to observe the highest standards of professional conduct, which includes maintaining the confidentiality of the data. No objection from the assistant was recorded and she signed a consent which can be found in appendix 13. Descriptive statistics, including frequencies, percentages and means, were generated using SPSS for later analysis and discussion.

3.8 Summary

This chapter has presented an overview of the research design used in this research study. Various methods such as semi-structured interviews with students and teachers, focus group, field notes, and questionnaires have been employed in the light of the literature. The settings, methods and procedures applied for data collection and data analysis and ethical concerns of the study were also addressed.

CHAPTER FOUR
RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter reports the results of the research findings and discussion from Phases I and II. Phase I sets of findings are from 3 students and 2 teachers semi-structured interviews, 3 students' focus group and field notes. Phase II findings are from students' and teacher's questionnaires. Phase II data were collected from 89 students across 3 PBL classes and 10 LS teachers from the same school as Phase I. Descriptive statistics of frequencies and percentages were compiled for Phase II from the questionnaires and are reported thematically.

Phase I set of findings is an analysis of my conversation with 2 teachers and 6 students on the implementation of the PBL approach in their LS lessons. Whereas Phase II aimed to provide a wider scope of data involving more students and teachers.

This case study explored the utilization of PBL and whether it influenced students' engagement in the classroom and how PBL affects the teaching style of the teachers. The findings present the evidence and focus on understanding the PBL environment if it could help to engage students in learning LS and enhance collaboration and SDL. Despite the introduction of PBL as a pedagogic approach in LS and being a policy directive, the PBL approach is still not frequently used in secondary schools in Hong Kong (Moallem, Hung and Dabbagh, 2019). Nevertheless, the PBL approach has pedagogic features such as problem-solving techniques, SDL strategies and collaborative learning, which may be useful for an issue based and interdisciplinary subject like LS. To understand the process of implementing the PBL approach from students' and teachers' point of view, this study sought to identify the roles of the PBL teachers, who are applying PBL as pedagogic approach to explore the aspects of the PBL environment and if the PBL approach helps to engage students to learn compared to other group of students learning more traditionally.

The following sections will report the findings of this research study and evaluate and provide an overview of the research findings and frame them within the context of the themes. To present these findings in a systematic way, I chose to use research questions under the 3 themes, namely: (1) Student Engagement under PBL, (2) Students' concerns under PBL and (3) Teachers' concerns under PBL. A mixed approach of inductive and deductive analysis was used to conduct this research. Qualitative approach is considered inductive as the purpose is not to test theory but to generate theory and explanations of phenomena whereas quantitative starts with theoretical construct. Themes were generated during the data analysis process of Phase 1, applying the framework provided by Braun and Clarke (2006) on Thematic Analysis. The data set including interview transcripts and field notes were first read, re-read, coded and themes were then emerged. As mentioned in the previous chapter, the same themes were applied to both students' and teachers' questionnaires.

The research questions are as follows:

1) What effects does a PBL approach have on the teaching style of LS teachers in Hong Kong?
2) How does the PBL approach affect students' engagement in learning LS in Hong Kong?
3) How does PBL influence the knowledge gained by students through in Hong Kong collaborative learning?

4.2 Theme 1: Student Engagement under PBL

Shulman (2002, p.2) states that "learning begins with student engagement". To help students to learn the knowledge teachers need to engage the students in learning first. The main components of student engagement are the amount of effort the students put in studies and how the teachers design the lessons to induce students to participate in the class (Kuh et al. 2010). The research question on how the PBL approach affects students' engagement in learning LS was addressed under the theme "Student Engagement under PBL".

4.2.1 Theme 1: Findings

Heinecke (2016) argues that students engage in the lesson when they are totally immersed in the task and persisting to move to deeper knowledge by looking from various aspects to solve a problem. Since teachers acted as facilitators, passive students were given more attention and assisted in solving the problems by scaffolding. Teacher Wera believes that students are engaged when they are encouraged and motivated. Hence, in PBL, the teacher's role as a facilitator is vital. Here is what both teachers remarked in the interview:

> ***Wera:*** *Students did better than what I expected, but it required a lot of encouragement and positive feedback assuring them they are doing a good job. I believe students truly obtain more knowledge and skills during the process of PBL. They are more independent and active learners under PBL. (Line 190-191)*

> ***Kael:*** *Students were engaged and motivated in my class. PBL is a positive reinforcement to help students to learn better. The nature of the PBL approach using problem statements motivates students to brainstorm and search for answers by themselves. (Line 224-235)*

During my own lessons with PBL and TTM classes, one of the most salient findings of my field notes is that students appear to be engaged in tasks and prefer active speech when given opportunity but with hesitation. As an example, when I asked students from my PBL and TTM class to explain whether a green life improves the quality of life of Hong Kong people, answers

from both classes differed in elaboration. TTM students gave very brief answers as they were not used to speaking up in class and were not given the opportunity to brainstorm. Below are the responses from TTM students.

> ***Emi:*** *I disagree, as it will decrease the materialistic life of Hong Kong. Hong Kong is a shopping paradise.*
>
> ***Josh:*** *I disagree, as it means fewer gatherings with friends. Nothing much to do sitting at home will not improve our quality of life.*
>
> - recorded in Field Note, 4th May 2017

The PBL class, on the other hand, provided elaborative answers; below is the response from a PBL student:

> ***Arvin:*** *I disagree with the statement. Firstly, Hong Kong is a financial center with a high GDP per capita but limited land supply. Houses are exceedingly small; hence people prefer to eat out or hang out and shop than sitting at home. The living standard is high in Hong Kong. People have higher purchasing power they can even afford to dine out three meals a day. Green life means buying fewer things, eating at home, taking mass transport and that will definitely not improve the quality of life of people in Hong Kong.*
>
> - recorded in Field Note, 4th May 2017

Another typical example from my PBL class below shows when students were asked whether Hong Kong should implement Electronic Road Pricing (ERP). Their answers were more elaborate as they brainstormed during the discussion.

> *Sara suggested business districts such as Central, TST and Wanchai are ideal districts to apply ERP. However, Ben disagreed; he believes that since HK is a free economy, ERP will be interfering with HK being a free market and discourage foreign investment in Hong Kong. Furthermore, Mel argued, we have people living in these commercial districts and some are*

from the middle class which will decrease their quality of life. Hence, ERP in commercial areas will not work in Hong Kong as no district is purely a business district in Hong Kong….

- recorded in Field Note, 13 April 2017

Some of the questions developed as part of the questionnaire aimed to understand whether PBL could increase students' engagement to learn LS when taught using the PBL approach. The questionnaire was completed by PBL students who were taught using the PBL approach. These students were often given the opportunity to engage in activities throughout the learning process, such as participation in the classroom activities and actively thinking about how to solve the problems.

Table 17 shows the response from the students, whether PBL is an active way of learning compared to the expectation of students. PBL as an active learning strategy stands in contrast to TTM by introducing a participatory expectation into the classroom. The data shows that the majority of the students (35 students strongly agreed, and 45 students agreed) agreed that PBL is an active way of learning. Consequently, it could be concluded that students are more likely to be actively engaged when learning under the PBL approach.

	PBL is an active way of learning than traditional lesson
Strongly Agree	35 (39.3%)
Agree	45 (50.6%)
Disagree	9 (10.1%)
Strongly Disagree	0 (0%)

Table 17: PBL is an active way of learning

PBL is a student-centred approach, which means lectures are kept to a minimum and sessions remain interactive (Gentry, 2000). Generally, under the PBL approach, students communicate and take responsibility for their learning instead of listening and reacting to the teachers. However, when students were asked if they spoke more than the teacher surprisingly, the majority (38

students disagreed, and 12 students strongly disagreed) of the students disagreed as shown in Table 18. On the other hand, when students were asked whether they were active in the group the result in Table 18 shows that 9 students strongly agreed and 59 agreed that they were active in the group. From the data, it can be concluded that although students were active when given the opportunity to work in groups, teachers spoke more than the students throughout the learning process, providing guidance and scaffolding for the students. Nevertheless, it can still be suggested that the PBL approach does encourage students' engagement in learning LS.

	I speak more than the teacher	**I was active in the group**
Strongly Agree	2 (2.2%)	9 (10.1%)
Agree	37 (41.6%)	59 (66.3%)
Disagree	38 (42.7%)	19 (21.3%)
Strongly Disagree	12 (13.5%)	2 (2.2%)

Table 18: How active are the students under the PBL approach

PBL students found great satisfaction in learning under the PBL approach. They could understand and solve the problems by themselves by working in groups. The process could stimulate the students to learn better and understand knowledge outside the textbooks. Students learning under TTM were more like recipients of knowledge and obtained the knowledge directly from the teacher. Since I did not ask questions students rarely engaged or raised questions and eventually lost concentration.

Researcher: *Andrew! You were dozing off in my lesson.*

Andrew: *Sorry, I am trying my best to be awake.*

Researcher: *Is my teaching so boring?*

Andrew: *No, but just sitting and listening is very boring and difficult to focus. I cannot just listen and do nothing.*

- recorded in Field Note, 26th April 2017

The feedback from the 2 teachers who were employing the PBL approach also reflected that most of their students were engaged in the task and were willing to take responsibility for their own learning. Both teachers reported that once the students understood the process of PBL, they started preparing before coming to class. Furthermore, it also encouraged low achievers to come to the class well prepared. The whole process improved students' collaboration, interpersonal skills, critical thinking, and presentation skills and also promoted self-directed learning.

- recorded in Field Note, 9th May 2017

All 6 students, who were interviewed individually (3 students) and in a focus group (3 students) commented that PBL is beneficial in enhancing critical thinking and life-long learning especially to those who are hardworking and are willing to speak up. Some students also stated that due to peer pressure and to form conformity, PBL could encourage shy and reserved students to participate in group discussion. Below are the responses from student semi-structured interviews:

> ***Yash:*** *PBL gives me more opportunities to talk and discuss even when I am quiet during the discussion. Since they are people I know very well and are a small group I would dare to talk more openly. If I do not talk, my groupmates might think I am dumb. (Line 28-29)*

> ***Simone:*** *When the teachers give us problems to solve no matter if it is a problem statement or news article or questions to discuss it makes the lesson more interesting and since I am engaged in the discussion it helps me to absorb more information and faster. PBL compared to the teacher talking using PowerPoint I prefer PBL as we get to discuss more issues and it is fun. (Line 33-34)*

> ***Uma:*** *I did enjoy PBL as I can communicate with my classmates. It is fun solving problems with peers compared to just listening to the teacher, which can be very boring if too frequent. (Line 53)*

The interview and focus group analysis also showed that the students preferred learning under the PBL approach as it provides more flexibility and is less monotonous. Students in PBL classes

appeared to be more engaged, attentive and performed better than the TTM class on the content and problem-solving measures. Below are the responses of students from the focus group.

> ***James:*** *Since I contribute a lot during the discussion, I have a better understanding of the content knowledge, whereas if the teacher uses PowerPoint it is boring. I will be merely copying or listening or might even be daydreaming eventually. (Line 96)*

> ***Mel:*** *I agree with James in PBL it is less likely that we do not pay attention as everyone has a role to play and no one wants to look stupid in group hence we are forced to be attentive. (Line 98)*

> ***Peter:*** *Looking at PowerPoint or the teacher talking is very boring, I often fall asleep, but discussions under PBL make me contribute and there are fewer chances for not participating. (Line 99)*

Table 19 shows the response to the question if the PBL approach could arouse the interest of the students in learning LS. It was found that 13 students strongly agreed, and 46 students agreed that the PBL approach could stimulate their interest in learning LS. It can be interpreted from the data that students were active in class when learning LS under the PBL approach.

	PBL stimulated interest in learning LS
Strongly Agree	13 (14.6%)
Agree	46 (51.7%)
Disagree	28 (31.5%)
Strongly Disagree	2 (2.2%)

Table 19: PBL stimulated interest in subject (LS)

To further understand how PBL may inspire student engagement in learning LS, students' perceptions were examined. The results in Table 20 from the data collected indicate that 18 students strongly agreed, and 56 students agreed that they enjoyed learning under the PBL

approach. Furthermore, 29 students strongly agreed, and 40 students agreed that they found learning under the PBL approach fun. Based on the data analysis, it can be evidenced that the students appreciated this student-centred PBL approach.

	I like PBL as a way of learning	PBL makes learning more fun
Strongly Agree	18(20.2%)	29 (32.6%)
Agree	56 (62.9%)	40 (44.9%)
Disagree	14 (15.7%)	15 (16.9%)
Strongly Disagree	1 (1.1%)	5 (5.6%)

Table 20: How appealing is PBL to the students

When asked if the PBL approach can assist in achieving higher grades in public examinations**,** one student responded as follows.

> ***Yash:*** *PBL helps with examination revision. I feel there is less to memorise when we learn from problem statements. During the discussion, I am actively involved, which helps me to remember things easily as sometimes we joke around or say silly things and those things get stuck in my brain and makes it easier to recall. (Line 17-18)*

Table 21 shows the response from the teachers on whether students were actively involved in class when learning under the PBL approach. All the teachers either agreed (9 teachers) or strongly agreed (1 teacher) that students were interactive and engaged in class when learning under the PBL approach. The result is in line with what students reflected earlier, namely that they were active in class and enjoyed learning LS under the PBL approach.

	Students are actively involved in class when learning under the PBL approach
Strongly Agree	1 (10%)
Agree	9 (90%)
Disagree	0 (0%)
Strongly Disagree	0 (0%)

Table 21: How Actively are students involved under PBL

With reference to my research questions on how PBL influences knowledge gained and student engagement in learning LS. The findings revealed a higher engagement of students who learnt under the PBL approach than those who learnt under TTM. Students, who learnt under the PBL approach scored higher in presentations and assignments compared to those learning under the TTM. Samples of students' work from PBL and TTM can be found in Appendices 15 and 16. Table 22 shows the score for the assignments. As mentioned earlier assignments were standardised for all the classes despite the teaching approach applied.

Student Name	Marks (%)
Simone (PBL)	75
Uma (PBL)	77
Angel (TTM)	50
Sam (TTM)	37.5

Table 22: Homework Scores

During one of the lessons with my PBL class, I prompted the discussions by asking follow-up questions to help students engage and build confidence to speak up and participate in solving problems. One of the groups was discussing which social class of people are suffering the most in Hong Kong. One of the students from the PBL class responded as below:

Amanda: *Obviously, the grassroots!*

Researcher: *Are you sure, Amanda. Think about the subsidies that grassroots families get compared to sandwich groups.*

Amanda: *Wait! Sandwich groups cannot apply for any subsidies on top they have home loans to pay off, whereas grassroots can apply for public housing and get medical and transportation allowances.*

- recorded in Field Note, 19 April 2017

I redirected the student to think more deeply reminding the student of all the subsidies and financial support the Hong Kong government provides to low-income families in Hong Kong. Here my role as a facilitator helped the students to reach a deeper level of thinking by scaffolding. Whenever the students failed to attempt, I did not give them answers directly but asked them to justify and explain their solutions or prompted open ended questions. By redirecting their thinking, students were helped to develop problem-solving, metacognitive, and reasoning skills. It built the confidence of the students by making them believe they could accomplish the task. Occasionally, the other PBL teachers modelled metacognitive questions to encourage reflective learning by asking questions such as why they considered certain solutions to be better than others. For example, Kael noted that,

Kael: *In my PBL lessons I allowed students to give feedback to their classmates on their work. It was nice to see that most of the students were actively involved in questioning and challenging others' ideas and making suggestions.*

- recorded in Field Note, 26 April 2017

In exploring student engagement students were asked to consider the new role of the teachers as a facilitator in PBL lessons. To understand this, students were asked whether the teacher helped them to brainstorm, which is a key aspect of the PBL approach. The findings showed that (Table 23) 24 students strongly agreed, and 53 students agreed that the teacher helped them to brainstorm. The response indicates that the teachers provided a student-centred environment that encouraged problem solving by keeping the discussion focused and leaving students challenged, which are key features of the PBL approach.

	Teacher helped to brainstorm
Strongly Agree	24 (27%)
Agree	53 (59.6%)
Disagree	9 (10.1%)
Strongly Disagree	3 (3.4%)

Table 23: Teacher helped to brainstorm

Within the student questionnaire, students were asked to comment on the new role of the teachers as facilitators in PBL lessons. The main purpose was to understand if students felt the teacher was acting as a facilitator rather than directly giving answers. The findings as shown in Table 24, 24 students strongly agreed, and 55 students agreed that the teachers acted as a facilitator. The evidence from the data indicates teachers provided guidance by asking questions, acting as a facilitators during the lesson and in the problem-solving process.

	Teachers act as a facilitator
Strongly Agree	24 (27%)
Agree	55 (61.8%)
Disagree	7 (7.9%)
Strongly Disagree	3 (3.4%)

Table 24: Teachers act as a facilitator

Throughout the PBL process, PBL teachers provided a constructivist learning environment in which students had to keep thinking about why they chose to do what they were doing. There was a shift in pedagogy from a teacher-centred to a student-centred environment, where the entire responsibility to learn was on students. Students were asked to come up with things they did not know and wished to know. Students were reminded that they own their learning, and this helped them to develop a habit of self-directed learning.

With reference to my research question on how the PBL approach affects students' engagement in learning LS. The findings revealed that students and teachers both agreed that learning under the PBL approach leads to student engagement in learning LS. This supports the argument that PBL

is a constructivist learning environment where students have ownership of what they learn. However, we cannot ignore the fact that students agreed that the teachers spoke more than the students despite PBL being a student-centred approach.

4.2.2 Theme 1: Discussion

LaForce, Noble and Blackwell (2017) argued that PBL is intrinsically motivated and encourages student engagement in learning. The evidence from the data gathered from this research study in both Phases indicates that the PBL approach encouraged students' engagement in learning LS. Overall, most of the teachers and students rated student-centred approach positively. Most students found learning under the PBL approach fun and agreed that it stimulated their interest in learning LS. The evidence from the data set confirmed that PBL encouraged students in learning an interdisciplinary curriculum like LS. This is similar to Guthrie (2000) and Pintrich (2003) findings that demonstrated students are more engaged when they own their learning. Most teachers in this research study found students actively involved in class when they were teaching under the PBL approach. This supports the findings of Finkelstein et al (2010) and Gentry (2000) who concluded that students learn best when they are engaged in the learning process and discover for themselves the meaning of knowledge. This also supports the view of Brown (2004), who concluded that PBL suits SDL because learners learn best when they are encouraged to think reflectively, and they are offered choices and responsibility during the learning process.

Students in this research study were invited to engage in the learning process and construct their knowledge by involving themselves in activities that emphasized on collaboration and interaction (Zumbrunn et al. 2014), which are the characteristics of student engagement. When working in groups, it is important to encourage effective teamwork (Boss, 2012), which allows student engagement in learning. In general, the constructive talk was more frequently found in PBL classes compared to TTM. The evidence from this study demonstrated that students enjoyed working in groups and gained more knowledge compared to TTM. According to Wynn and Mosholder (2016) under PBL students generate arguments to recognize conflicts and contradictions among competing positions, which helps the students

to produce work of a higher quality. The collaboration and conflicts allowed students to exchange ideas and construct questions that could assist in problem solving. Furthermore, the findings in this research study suggests that working in groups contributes to the development of interpersonal, communication and presentation skills, increase in student engagement and higher order thinking. This is in line with Jerzembek and Murphy (2013), who found the following effects of PBL on students: (1) enhancement of student understanding (Azer, 2009); (2) higher intrinsic goal orientation and higher levels of critical thinking (Sungur and Tekkaya, 2006); (3) motivation in independent work and increase in self-efficacy (Cerezo, 2004); (4) increase of intrinsic motivation (Zumbach, Kumpf, and Koch, 2004); and (5) increase in self-confidence in collaborative work and development of social and leadership skills (Wang et al. 2010).

Findings from this research study also showed that PBL could help students to develop SDL, enhance enthusiasm, and motivation. The findings from this research study are in line with Hmelo-Silver and Barrow (2008), who indicate that PBL helps to push students to form deep explanations and understanding of the topics.

Teachers in this research study encouraged autonomy, where students could manage their own learning. They helped the students to build confidence and reconstruct their view of their role and ability in learning LS by allowing students to take ownership of their learning. Overall, the findings of this research study were similar with those of Lattimer and Riordan (2011), who described that PBL as an effective way to engage and inspire learners.

The silence of some students can be explained by what Jaworski and Sachdev (2004) claims, that students might use silence for listening and comprehension even though students might not verbally participate in the classroom. In this research study, some students did not interrupt the teacher when he or she was talking, which indicates that they listened, digested, judged information, and generated new ideas. This silent process is therefore considered a means of productive learning in which knowledge is internalized by learners themselves as well as constructed in the group. Eventually, it helps students to develop knowledge, effective

problem-solving skills, and SDL skills required for effective engagement in PBL (Hmelo-Silver, 2004).

4.2.3 Summary

The findings from the data collected show that the majority of the students and teachers found PBL is an appropriate approach for teaching and learning LS. PBL increases students' motivation and engagement in classroom learning. Students expressed that they enjoyed their roles in the PBL setting. Furthermore, the teacher's views agreed with those of the students with regard to PBL engaging students in learning. Upon teacher encouragement, students were found to be engaged by both students and teachers. The findings from this research study indicates that PBL may increase students' knowledge of content through scaffolding. A desire to seek knowledge was seen as students took the responsibility for their learning by coming well prepared for the lessons.

4.3 Theme 2: Student's concerns under PBL

This theme helps to understand the difficulties faced by the students when learning under the PBL approach and how the PBL approach influences the knowledge gained by the students through collaborative learning. In PBL lessons, students worked in small groups to identify what was needed to solve the problems. To understand if students had concerns about learning in such a student-centred environment, they were asked questions such as if the PBL approach could lead to a better subject knowledge of LS compared to TTM and if they faced any group dynamic barriers, which could hinder their engagement in the lesson. Teachers were also asked whether they felt students would have concerns when learning using the PBL approach.

4.3.1 Theme 2: Findings

It was agreed by all 6 students involved in the student interview and focus group that most of the students find it easier to adapt to the PBL approach except those with lower academic standards. Low achievers proposed that more background information on the module and problem statement is needed to understand the basic concepts. Low performers are less motivated to learn and often feel frustrated and confused at first when taught in a more independent method.

> ***James:*** *My classmates were too fast in the group dis*
> *cussion sometimes I could not follow. Hence, I did not contribute much. They came well prepared with notes which I did not. I like sitting and listening to the teacher. I feel I learn faster when it is directly from the teacher.*
>
> - recorded in Field Note, 2nd May 2017

When James was asked further if his problem was solved, he claimed that with more guidance and motivation from peers and the teacher he managed to adapt to the PBL approach.

- recorded in Field Note, 2nd May 2017

When students were asked if PBL is suitable for senior secondary the feedback from student interviews as follows:

> ***Yash:*** *At times I feel frustrated due to heavy syllabus and too much homework. I just wish the teacher could teach the content knowledge, provide notes, and give answers right away be easier. (Line 21-22)*

> ***Simone:*** *I prefer PBL should not be used too often. As everyone's target is to get high grades in DSE hence it is more important to familiarise with the public exam marking scheme. (Line 51-52)*

In addition, most of the students in my PBL class responded that the time was not sufficient to discuss problem statements in-depth, from various aspects and perspectives of the various stakeholders.

> ***Olivia:*** *My main concern when learning under PBL is where to stop. For instance, whether HK is an ideal place to live is an extremely broad topic as different social groups have different needs; immigrants, refugees, rich in HK, high middle-income class, low middle-income, grassroots.….and time was not sufficient to cover everything as we had to move on to the next issue.*
>
> - recorded in Field Note, 13th April 2017

> ***Jasmine:*** *I think PBL is perfect for LS. LS is not content based; it is an issue-based subject and through PBL we can discuss the issue from various aspects. However, I will still be worried if what we are discussing is correct or not. Yes, the teacher will be patrolling, but he or she will not be able to comment or monitor all our discussions.*
>
> - recorded in Field Note, 13th April 2017

Students' feedback included the perceived heavy workload of quizzes and assignments from other subjects, which affected their quality of learning. Most of the students commented that PBL is

sometimes time consuming because it takes too much time to discuss one issue which could be covered in one or two lessons if it is taught directly by the teacher under the TTM approach. However, at the same time, it led to deeper understanding of the problem.

Students also complained about interdependence when working in groups, especially when working with low achievers or careless students. Below is the feedback from student interviews and a focus group:

> ***Simone:****…sometimes group members are not serious about the work and talk irrelevant things, then it is a waste of time…(Line 41)*

> ***Peter:*** *If we only have smart ones in the group then PBL can assist in learning LS as we can discuss many issues and look at various aspects in a short period of time. But if we have low achievers, then it slows down everyone. (Line 161)*

> ***James:****….once after discussing the issue we had to present and one of our group members lost his USB which lead to other members had to help him do his work as time was not enough for him to finish off the entire work….(Line 144)*

In the students' questionnaire, three questions were designed to understand if grouping was a concern for the students. As shown in Table 25, most of the students (35 disagreed and 24 strongly disagreed) do not prefer teachers to arrange group members for them. Furthermore, 38 students strongly agreed and 35 agreed that they prefer teachers to allow them, as students, to choose their own groupmates. However, this finding is in stark contrast to the responses given to the questions posed on whether group dynamics are barriers to participating in the lesson. 50 students disagreed and 10 students strongly disagreed that group dynamics hinder their participation in the lesson.

	I prefer groups to be arranged by the teachers	I prefer allowing students to choose groupmates	Group dynamics are barriers to my participation in the lesson
Strongly Agree	8 (9%)	38 (42.7%)	5 (5.6%)
Agree	22 (24.7%)	35 (39.3%)	24 (27%)
Disagree	35 (39.3%)	12 (13.5%)	50 (56.2%)
Strongly Disagree	24 (27%)	4 (4.5%)	10 (11.2%)

Table 25: Grouping

It appears that due to interdependence students did not appreciate working with certain students. However, on the other hand, students seemed to be comfortable working with classmates they had chosen, and group problems did not reduce their participation in the lesson.

Some students found PBL to be incredibly stressful as they needed an exceptionally long time to overcome the fear of losing face when sharing their thoughts. The data below was collected from field notes, which shows that PBL students tend to talk when placed in pairs or groups rather than speaking out answers in front of the whole class. Students appeared afraid of being wrong and embarrassing themselves in front of the entire class.

> ***Researcher:*** *Can you please speak up? I cannot hear you.*
> ***Ciana:*** *I am worried my answer might be wrong.*
> ***Researcher:*** *Do not worry, Ciana. Classroom is a place for making mistakes and correcting them.*
> ***Ciana:*** *Classmates will laugh at me if my answer is wrong or silly.*
>
> recorded in Field Note, 24th April 2017

Teachers were also asked if they felt students were having any concerns when learning under the PBL approach compared to TTM. The findings from the data as shown in Table 26 indicates that 2 teachers strongly agreed, and 5 teachers agreed that the PBL approach helps students to gain more knowledge compared to TTM. Three teachers made the following comments in the teacher's

questionnaire on whether the PBL approach helps students to gain more subject knowledge compared to traditional lessons or if there were any concerns:

- *Passive learners might have a concern as they learn less when it comes to group learning*
- *High ability students might fear of learning less as not everyone is serious in the group*
- *It is the pattern of working in a group with peers in PBL that help discussions and knowledge gained. Hence, those who refuse to interact in groups do not seem to learn much.*

	PBL approach helps students to gain more subject knowledge compared to TTM
Strongly Agree	2 (20%)
Agree	5 (50%)
Disagree	3 (30%)
Strongly Disagree	0 (0%)

Table 26: PBL and knowledge gained (teachers' Questionnaire)

From the data, it can be suggested teachers believe that PBL is beneficial to most of the students in gaining more knowledge compared to the TTM approach. However, whether PBL benefits low achievers in gaining knowledge was the concern of the teachers.

Below is the extract from a focus group when students were asked if they prefer the PBL approach and if it could assist them to perform better in the public examination (DSE).

Mel: *When it comes to DSE I am not very keen with the PBL approach because my target is to score high marks and sometimes, I feel we spend too much time on one issue. (Line158)*

James: *Agree with Mel and to be honest, we do not have that much time to go home and search for information. There are a lot of other subjects' homework to do as well. (Line 159)*

One of the days after my PBL class, I asked Matilda, who is a good listener but moderately participating in her group. Below is her response:

> ***Matilda:*** *I find PBL useful as the problems discussed are within the syllabus content. I get to learn from my classmates who are quick thinkers. But sometimes I feel frustrated as I am a slow learner and there is so much homework and contents to cover. I wish the teacher could just explain rather than be looking for solutions. That would be quick and save time.*
>
> - recorded in Field Note, 3rd May 2017

The findings from the data, as shown in Table 27 indicates that 13 students strongly agreed, and 56 students agreed that learning under the PBL approach leads to more knowledge than TTM. Similar views could be found on whether there is less to memorise under the PBL approach, 17 students strongly agreed, and 49 students agreed that there is less to memorise when learning under the PBL approach. When students were asked if they had a better understanding of the LS subject under the PBL approach compared to a typical or TTM lesson, 9 students strongly agreed, and 56 students agreed.

	PBL leads to more knowledge than TTM	**Less to memorize under PBL**	**I have a better understanding of the subject knowledge of LS when learning under the PBL approach**
Strongly Agree	13 (14.6%)	17 (19.1%)	9 (10.1%)
Agree	56 (62.9)	49 (55.1%)	56 (62.9%)
Disagree	18 (20.2)	23 (25.8%)	23 (25.8%)
Strongly Disagree	2 (2.2%)	0 (0%)	1 (1.1%)

Table 27: PBL and knowledge gained (students' Questionnaire)

Analysis of the data gathered from this study indicates that most students in this sample agreed and believe that the PBL approach increases their knowledge in learning LS. However, the PBL approach is not much appreciated when it comes to public examination.

Despite the concerns raised by some students over the struggle of low achievers, group issues and incompatibility of the PBL approach with the public examination, there is still broad support from the data analysis that the PBL approach enhances the affective domain of student learning and fosters better retention of knowledge. Students seemed to be in favour of that shift of the teacher's role from an instructor to a facilitator. Teachers guided them by monitoring their discussions and intervening when appropriate by asking questions that probe accuracy, relevance and depth of the information facilitated understanding of the subject. Although students preferred to choose their own group members to stay within their comfort zone, group dynamics were not a concern or barrier to their learning.

4.3.2 Theme 2: Discussion

According to Hallermann and Larmer (2013) and Boss (2013), PBL is an instructional strategy that motivates students to dig deeper, think analytically, and analyse and solve problems. In this research study, the PBL teacher's pedagogy was in line with this view. PBL teachers provided a constructivist learning environment where students are encouraged to justify their answers. Teachers prompted the PBL students to discuss constructively. The statistical analysis of the responses from the teachers and students in this study has shown that students gained more knowledge when learning under the PBL approach and students responded positively to having less memorise as it increased their understanding. This is in line with Dochy et al. (2003), who state that the PBL approach provides a better understanding to the students.

Furthermore, the findings from this research study have shown that group dynamics were not a concern to most of the students as Boss (2012, p.40) stated that working together as a team is "essential for breaking a big, open-ended question into manageable pieces". However, teachers and students identified that few passive learners and low ability students had

concerns when learning in groups. Both students and teachers agreed that students with higher academic standards found it easier to adapt to the PBL approach compared to those with lower academic standards. The evidence from this study show that low achievers and passive learners were less motivated to learn and were confused at the beginning when taught under the PBL approach. The findings from this research study suggest that the reluctance of low achievers to participate in groups created an atmosphere of dependence of low achievers on high achievers and made low achievers reluctant to engage more actively in the learning processes. However, it was generally revealed in the finding that scaffolding and peer learning helped to encourage low achievers to engage and move from being dependents and frustrated to being able to engage in learning. This finding does not support Wynn et al. (2016), who claimed that social learning dynamics that are critical to the success of PBL activities are more easily facilitated in smaller classes or groups.

The Hong Kong education system is examination oriented with high stakes assessment (Berry 2011). Students in this study raised the concern that the PBL approach should not be used too frequently as it is time consuming and the syllabus is too heavy and lengthy. They prefer the teachers to focus more on examination skills. This is in line with Kwok (2004), who stated that Hong Kong students strongly focus on marks for examinations and assessments.

4.3.3 Summary

Students displayed critical thinking, self-confidence and cognitive maturity when learning under the PBL approach as students displayed their own ability to solve the problems and were prudent when solving the problems. PBL students showed the ability to conduct their discussions with extended knowledge. When students faced challenges, they were more likely to work in groups and take up ownership of their own learning. However, students raised their concerns over PBL being time consuming and not very suitable for the DSE curriculum and low achievers. The findings from this study identified that students would not feel overwhelmed provided the PBL approach is introduced systematically. There was a distinct difference between PBL and TTM.

4.4 Theme 3: Teachers' concerns under PBL

This theme helps to understand the difficulties faced by the teachers when applying the PBL approach and the influence of the PBL approach on the teaching style of LS teachers. It also analyses the teachers' perceptions regarding PBL.

4.4.1 Theme 3: Findings

On a few occasions during discussion and interviews, the responses from PBL teachers indicated that they perceived several disadvantages of adopting the PBL approach. They found the PBL approach time consuming and not suitable for the exam-oriented and over-packed local (DSE) curriculum.

> ***Wera:*** *Since LS is an issue-based subject it is important to teach students skills rather than contents. Otherwise, it is impossible to cover all the issues. However, time is the limit. There is not sufficient time to use the PBL approach frequently. It requires a lot of extra work, which makes it difficult to be applied often as we rush to finish the curriculum and need time to drill on past papers also.*
>
> - recorded in Field Note, 3rd May 2017

Below is an extract from a teacher interview:

> ***Researcher:*** *What are the factors affecting you to implement the PBL approach?*
> ***Kael:*** *The curriculum contents are too wide. If I use PBL frequently I am worried I will not be able to finish teaching the syllabus before the public examination. (Line 244)*

During a tea break, I had a short conversation with teacher Wera. She reflected that since PBL does not directly follow the contents from textbooks, some students, especially low achievers and those with poor organisation skills, struggled to revise for quizzes and exams.

- recorded in Field Note, 10th May 2017

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As shown in Table 28, this study found that 8 teachers agreed and only 2 teachers disagreed that PBL is time consuming in terms of lesson preparation. Similarly, when teachers were asked if PBL is time consuming in terms of delivering the lesson 1 teacher strongly agreed and 6 agreed while only 3 teachers disagreed. From the findings, it appears that teachers feel PBL increases their workload.

	PBL is time consuming in terms of lesson preparation	**PBL is time consuming in terms of delivering a lesson**
Strongly Agree	0 (0%)	1 (10%)
Agree	8 (80%)	6 (60%)
Disagree	2 (20%)	3 (30%)
Strongly Disagree	0 (0%)	0 (0%)

Table 28: Is PBL time consuming

In the interview, teacher Wera raised an interesting thought when I shared with her the concern of my TTM class being noticeably quieter compared to my active PBL class. Wera commented that

> *Student-centred teaching approaches are not easy to implement in the classroom. If instructors do not have enough guidance or support, they can easily fall into the trap of thinking that just because these approaches are interesting and engaging, students are learning the things they need to learn. Students could be discussing other stuff irrelevant to the problem statement and not focused on all. (Line 179)*

Wera's comment points out that under PBL, teachers must keep monitoring to ensure students are working on the problem statements and are going in the right direction.

Under the PBL approach, students are allowed to discuss and sit in groups and classroom management becomes a challenge for some teachers. This could be the reason as it is not common in Hong Kong to sit in groups and when allowed, students might take it as social gathering time. Teacher Kael expressed the following concern in the interview.

Kael: *Once students are allowed to sit in groups, they take the lesson casually and start socialising, and I have to keep reminding them to focus on their work. (Line 242)*

Teacher Kael and Wera both agreed that to apply PBL, the main focus should be on a good problem statement; hence the subject and pedagogical knowledge of the teacher is very important as it is vital to provide problems related to the students' prior knowledge. This is in line with Prosser et al. (2005) who found that educators who had a more holistic view of their subject matter content tended to focus their role as an educator on helping students acquire conceptual knowledge rather than just having students be recipients of content delivered in a didactic format. Both teachers found it difficult to strike a balance in creating problem statements suitable for independent learning. Below is an extract from teacher interviews illustrating difficulties teachers face in implementing problem statements.

Kael: *The planning stage of a problem statement is critical. Students often over-simplify the topics. Guiding them to a problem statement of an appropriate and reasonable level of difficulty is often challenging. Generating problem statements was time consuming and I feel creating a meaningful and authentic problem was exceedingly difficult. (Line 226-229)*

Wera: *Yes, regarding the problem statement I was not sure how ill-structured the problem statement should be or how much information should be given to the students as the students are diversified in abilities. As more ill-structured the problem statement is less appealing it is to the students. (Line 205-206)*

Furthermore, teachers raised concerns about the time required for teachers to equip themselves with good content knowledge of the LS curriculum.

Kael: *I have to attend seminars organised by COTAP to keep myself updated on the issues and to learn how to deliver the knowledge to the students and prepare the content materials as using textbooks is not sufficient for teaching LS. (Line 210)*
Wera: *LS consists of 6 modules and all modules are taught using recent issues related to the module. Hence, having a Geography background, I am not greatly confident with teaching*

modules like Public Health and Personal Development and Interpersonal Relationship. (Line 207-108)

Surprisingly, both teachers reported that students did not find learning under the PBL approach exceedingly difficult. It could be because follow up worksheets were provided specifically to cater to the needs of low achievers and working in small groups allows peer support.

Researcher: *Did you achieve the learning objectives under PBL?*

Kael: *Most of the time, yes. Even low achievers could acquire some basic steps of carrying out an inquiry study, e.g., data collection, data processing and analysis the worksheets are essential to guide the students, especially low achievers. (Line 218)*

This is in line with Pepper (2010, p.704), who stated that in the "early stages of PBL implementation it is vital that students receive guidance about how and why they are expected to work in new ways". It not only helps low achievers but also ensures students are on the right track. The question 'whether PBL complies with the DSE curriculum' displayed no obvious difference as shown in Table 29; 5 teachers disagreed, 1 teacher strongly disagreed and 4 agreed that PBL complies with the DSE curriculum. It can be concluded that slightly more teachers disagreed that the PBL approach is suitable for the DSE curriculum. The teachers made the following comments:

- *DSE curriculum is too packed and PBL takes too much time to cover the topics*
- *Guiding students on marking scheme is more important than anything else*
- *More contents can be covered quickly in direct teaching*

From the data analysis, it could be concluded that teachers find the PBL approach time consuming and not preferable for the DSE curriculum.

	PBL complies with DSE curriculum
Strongly Agree	0 (0%)
Agree	4 (40%)
Disagree	5 (50%)
Strongly Disagree	1 (10%)

Table 29: DSE curriculum and Knowledge gained

Table 30 shows that 7 teachers disagreed, and 1 teacher strongly disagreed that PBL leads to classroom management issues. The data collected suggests that since students are actively engaged in the lesson, as noted previously, PBL leads to fewer classroom management issues.

	PBL leads to classroom management issues
Strongly Agree	1 (10%)
Agree	1 (10%)
Disagree	7 (70%)
Strongly Disagree	1 (10%)

Table 30: Cooperative learning and classroom management

Teachers were asked if Hong Kong students are reluctant to speak up in classrooms to explore student engagement. The data collected (as shown in Table 31) indicate that 5 teachers agreed, and 2 teachers strongly agreed that students hesitate to speak up in class. Furthermore, some teachers highlighted in the comment box that more encouragement is required to build the confidence of the students to speak up in the class. Teachers' comments are as follows:

- *Students need more encouragement to speak up, as they are too shy and some worried about losing face if their answer is wrong or funny.*
- *Students needed more time to get used to speaking up voluntarily. They enjoyed it, but after trying several times.*

- *Most of the passive learners are low achievers hence they needed more encouragement to speak up in class.*

It can be concluded that the PBL approach requires additional effort from teachers to encourage students to speak up in class.

	PBL does not suit teaching HK Chinese students as they are reluctant to speak in class
Strongly Agree	2 (20%)
Agree	5 (50%)
Disagree	2 (20%)
Strongly Disagree	1 (10%)

Table 31: DSE curriculum and Knowledge gained

Despite all the concerns raised by the teachers, In Table 32, it can be seen that the majority (2 teachers strongly agreed, and 7 teachers agreed) of the teachers prefer the PBL approach as a teaching pedagogy. It could be argued that despite increasing the teachers' workload, they still prefer the PBL approach as a teaching pedagogy to TTM.

	I prefer PBL approach as a teaching pedagogy
Strongly Agree	2 (20%)
Agree	7 (70%)
Disagree	1(10%)
Strongly Disagree	0 (0%)

Table 32: PBL as a preference for teaching pedagogy

In general, teachers were positive about working under the PBL approach even though it increased their workload. Furthermore, the result reflects that PBL is not an appropriate approach to be used

frequently as the DSE curriculum is packed and exam oriented and some students struggled to revise for the quizzes and examinations.

4.4.2 Theme 3: Discussion

The evidence from both phases of this study supports the finding of Doppelt (2009), who discussed the possible concerns that teachers may face when implementing the PBL approach. Doppelt (2009) argued that the PBL approach is time consuming and much support is needed for teachers in lesson preparation. Similarly, the evidence from this research suggests that most teachers in this research study indicated that it takes a significant amount of time to prepare the teaching materials and deliver the lesson when applying the PBL approach. In this research study, teachers reported that setting, problem statements were frustrating. This is supported by Hung, Mehl and Holen (2013), who argues that if the problem is so vague or difficult that the students do not even know where to start and therefore have to be laboriously guided by the facilitator, there could be a risk that the students might develop a dependency on the facilitator for guiding them through the PBL process. Murray and Slee (2000) have emphasized on the importance of involving more teachers in lesson preparation. This does not only give a sense of ownership but also lead to fewer problems in making the transition to teaching PBL.

Furthermore, the data from this study showed that most teachers found that PBL is not appropriate for the examination oriented and heavy DSE LS curriculum, which influences the teacher's choice of pedagogy. The evidence from this research study shows that teachers' choice of pedagogy will tend to be narrowed to address the perceived imperatives of the mandatory curriculum, which echoes the findings of Tan et al. (2000), who argued that formal curriculums could constrain the open-ended learning of the PBL approach.

In a collaborative atmosphere, learning occurs while students are in the process of solving problems and sharing the results. Such an environment requires teachers and learners to play roles different from the roles they have been accustomed to (Choi and Jang, 2010). Both students and teachers in this study claimed that the role of teachers changed from teacher

centred to facilitator. The finding is also supported by Hallerman and Larmer (2013, p. 2), who stated that PBL is an instructional strategy that integrates well with a "shift from teachers doing most of the talking to creating an environment in which students can engage in meaningful conversations" The findings of this study do not agree with Azer (2009) who stated that teachers are not willing to change their teaching style to the PBL approach and are uncertain about their roles in PBL classrooms.

Peng (2012) and Jackson (2002) noted that Asian learners are unwilling to communicate, and this has concerned researchers and educators and a similar attitude was evident in this research study. Most of the teachers in this research expressed that Hong Kong students are reluctant to speak up in the class voluntarily. This was consistent with many researchers (Biggs, 1994; Cortazzi and Jin, 1996; Jones, 2001; Tsui, 1996; Wong, 2004) who often comment that East Asian students are reluctant to take up active speaking roles in classrooms (Littlewood and Liu, 1996). However, it was also worth noting from the teachers' comments that PBL students were willing to contribute their ideas but needed encouragement and spoke only when they were asked. This is like the findings of Fok (2002), who identified that it is generally common for Hong Kong students to only acquire knowledge that will be assessed in the examination and seldom raise inquiries or challenge the teachers.

Teachers did not face classroom management issues and students enjoyed learning under the PBL approach. This is in line with Gentry (2000), who argued that students learn best when they are engaged in the learning process and discover the meaning of knowledge.

Teachers were concerned that students' engagement does not mean they are learning. This is in line with Kolonder et al. (2003), who stated that teacher centred approaches are not easy to implement if the teachers do not have enough guidance, they might fall into the trap of thinking that because these approaches are interesting and engaging, students are learning things they need to learn.

4.4.3 Summary

Similar to students, teachers also raised their concerns over PBL being time consuming and not very suitable for the DSE curriculum and low achievers. Furthermore, the findings also revealed that PBL increases the teachers' workload, takes extra time to encourage students to speak up and is not admired if frequently used. Hence department support in preparing materials and an appropriate teaching approach are essential. Despite the concerns expressed by teachers and students, the results of this study provides evidence to support the adoption of the PBL approach in the LS curriculum.

CHAPTER FIVE
CONCLUSION

5.1 Introduction

This chapter provides an overview of the data analysis and frame within the context of the three research questions. This research study sought to investigate if PBL could lead to student engagement as a teaching approach. The data analysis has shown that students will not feel overwhelmed if the PBL approach is introduced systematically into the curriculum. From this research study, it can be concluded that overall students and teachers were satisfied with the PBL approach. However, PBL is not the only successful strategy to achieve student engagement.

5.2 RQ 1: What effects does a PBL approach have on the teaching style of LS teachers in Hong Kong?

This study revealed that both teachers involved in this research study agreed that LS is quite different from traditional subjects. To prepare problem statements teachers had to consult other colleagues, go through newspapers, journals, textbooks and browse the Internet to prepare problem statements close to students' interests and daily life and up to date. This demonstrated collaboration between teachers in different disciplines, confirming that PBL is a multidisciplinary approach (Maxwell et al. 2001; Barrett and Moore, 2015). The LS curriculum is about analytical, communication abilities, critical thinking and expression on current issues based on different perspectives and horizons. This study has revealed that PBL has features of an instructional approach for addressing LS curriculum. Bereiter (2002) stated that no extra knowledge is gained in cooperative learning when a joint-effort task is focused only on accomplishment. Hence knowledge construction through collaborative learning is crucial in LS.

Both teachers expressed that PBL increases teachers' workload, which is in line with Lai and Lam (2011), who proposed that four factors interacted with the subject features of LS namely, teacher knowledge, curriculum requirements, materials and resources, and interaction with equality and more capable partners. To effectively develop PBL pedagogy, teachers need to engage more

frequently in different dimensions of professional development, like understanding the curriculum, current knowledge and understanding of various modules and assessment development. The feedback from the teachers in this study indicates that they perceived several advantages of adopting a student-centred learning approach, which was consistent with their understanding of PBL as constructivist pedagogy (Brown and King, 2000).

5.3 RQ 2: How does the PBL approach affect students' engagement in learning LS in Hong Kong?

In TTM class, the teacher played a dominating role to deliver factual knowledge and questions were mainly asked by the teacher and seldom raised by students. This finding supported Fok (2002), who identified that it is common for Hong Kong students to only want to acquire knowledge that will be assessed in the examination and seldom raise inquiries or challenge the teachers. Peng (2012) and Jackson (2002) argued that Asian learners are unwilling to actively participate in class. However, this study found no evidence of such reluctance in PBL classes. The majority of the PBL students in this research study expressed a liking to communicate. Overall, most of the students enjoyed the speaking opportunity except a few shy and low achievers. Teachers had to help low achievers or less confident students by encouraging them to get engaged in solving the problems.

5.4 RQ 3: How does the PBL influences the knowledge gained by students through collaborative learning in Hong Kong?

Students appreciated guided worksheets provided at the beginning of PBL sessions as Pepper (2010 p. 704), stated that in the "early stages of PBL implementation, it is vital that students receive guidance on how and why they are expected to work in new ways". Cook and Molye (2002) also established that instruction with PBL motivated students to find new information, leading to more critical thinking.

Overall, the evidence from the data aligns with Hmelo-Silver and Barrow (2008), indicating that PBL helps to push students for deep explanations and understanding of the problems. Fullan and

Langworthy (2013) argued for pedagogical models that require deep learning to ensure that students leave school ready to face the challenges of the 21st century. PBL shows promise for nurturing deep learning skills in students. In the student interviews and the focus group, students reflected that they have less to memorise under the PBL approach.

5.5 Limitation

There were a few limitations to this study. Since there are no studies on the relationship between public examination Hong Kong Diploma for Senior Secondary (HKDSE) and critical thinking in LS, the literature on this subject matter was limited. Furthermore, the size of this research study is small; it was carried out in one of the DSS schools in Hong Kong using English as a medium of instruction. Further research needs to be conducted in other school settings such as Chinese context or Aided schools (government schools) to gain further understanding of secondary school students' achievement under PBL. Furthermore, the results could be different if the research is conducted under the influence of other cultures such as western culture. Broader and more in-depth evidence such as examination results should have been collected to understand whether PBL can increase the knowledge of the students. To further enhance the spectrum of data sources a control could be applied to understand the differences. The relatively short interviews lasting approximately 60 minutes each, are also a limitation in understanding, especially in a focus group where students have various viewpoints to share.

All these concerns should be addressed in future studies in this area. Based on my findings in this research study there is potential for a PBL approach in Hong Kong in an interdisciplinary curriculum like LS. Educators should be confident in applying PBL in the LS curriculum in senior secondary schools in HK. The results showed less memorisation is required and students are more engaged when issues are discussed using a PBL approach. The findings from this research thus cannot be directly applied to other PBL settings, which exhibit wide-ranging differences in the degree of structure.

This study did not take students' assignment grades into account. They were given to acknowledge students' effort and were not considered as part of formal assessment. In the other words, students' engagement in the lesson was purely intrinsic motivation.

5.6 Direction of Future Research

This research study has significant value to encourage teachers to examine possible differences in the impact of PBL and TTM in LS curriculum. It is hoped that this present study will lead to further examination of long-term impact of PBL whether PBL leads students to gain additional skills such as oral presentations, interpersonal skills, and conceptual change. PBL would be suppressed if it is not in line with 21st century life and workplace requirements. More research on linking the curriculum with whole-person development is key to consolidating the values of PBL and making it more sustainable.

Furthermore, innovative teaching approaches and ways of effectively increasing student engagement should be explored, testified, and evaluated in other subjects. Most research focusing on lesson observation and observing groupmates' behaviour would be a valuable indicator of high validity to understand how learning develops through discussion. It should be noted that although this study provides evidence to support applying PBL in LS lessons similar research is needed in other subjects as subjects vary in nature. Further studies to investigate the assessment matters related to PBL in LS and the impact of the PBL approach on the academic result would be appreciated. Furthermore, a better arrangement of the groupings is needed. The mixed ability of the students in a group may help but being outspoken has more to do with personality than academic ability.

5.7 Summary

The main purpose of this research study was to explore and examine if student participation in PBL leads to higher student engagement. The data revealed that PBL learners did acquire more LS knowledge than students learning under TTM. However, PBL students were not confident to speak up in class. But once the students adapted to the student-centred learning practice, they could

construct particularly useful discourses in their group discussions. The findings also showed that LS teachers experienced workload in material preparation due to the nature of the LS curriculum. This research study can contribute to professional development and teaching improvement by helping teachers to reflect and discover the conceptions of teaching approaches and how they affect students' engagement. This study has shown that PBL is an appropriate pedagogical practice for LS that can build up knowledge in students by encouraging questioning and reasoning.

LS, the subject, which was introduced as mandatory for senior secondary students in 2009, aimed at developing critical thinking and enhancing social awareness has been seen by the government as presenting biased views and blamed for radicalising youths who joined anti-government protests in 2019. The subjects' nature of broadening students' knowledge by applying PBL arguably had the potential to enhance young people's social awareness by studying a wide range of issues. The Hong Kong government in press conference stated that they believe the subject has turned youngsters against authorities, citing last year's social unrest, but general public and teachers insist it should be taught to promote critical thinking. The Hong Kong Education Bureau has decided Liberal studies should remain mandatory for senior secondary students, but with textbook vetting, trimmed content and changes to teacher training in place (Education Bureau Circular Memorandum No. 39/2021). From September 2021 onward the subject will be renamed Citizenship and Social Development (CSD). It will include more content about mainland China and less on current affairs while pupils will also be taught separately about national security issues.

The greater demand for collaborative learning in higher education justifies the need for an engaging environment at secondary school. Drawing on the findings from this research study, other educators will know the learning-related problems encountered by students in Hong Kong when applying the PBL approach and how they can be addressed. This research study lays the foundation for prospective researchers in this area and is relevant to those who are interested in this analysis, which cannot be provided by overseas research data. It can also assist local administrators and policymakers in Hong Kong,

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Appendix 1: Participants Academic Performances

Total Average score for academic year 2015/2016

Class/ Student No.	Class A	Class B	Class C	Class D	Class E
1	43.5	42.9	71	43	56
2	80.2	55	44.9	63.6	52
3	49.4	89	58	56	61
4	50.9	74	63.7	57	40.9
5	56	58	46.2	60.2	61
6	47.7	48.9	59	81.1	56.8
7	64	61	80	41.2	67
8	62.8	66.9	62	59.6	59.9
9	48.9	72.9	59	66	79
10	67	44.5	74.3	80.1	60.9
11	55	45	49.8	67	58
12	44	63	51	59	62
13	54.8	65	58	54	43.1
14	76.2	60.8	64	71	74
15	65.9	70	71.2	63.8	72
16	45	59.6	58	59.1	58
17	68	49	47.3	44.5	69.2
18	94.8	74	56.8	41	63
19	46.7	59	59.6	54.1	59.9
20	89	67	69.9	61	58
21	80	46	66	59.2	71
22	67	59	54	66	59.1
23	42.3	83	74	62.1	47
24	76	48.2	61	69	52
25	60	50.4	69.1	58.4	43.9
26	71.9	67	55.5	60	61
27	41.4	78	68	49.9	58
28	71	44.9	83.1	64.4	
29	60.4	88	67.4	50.2	
30		45	65	67.3	
31			59.8		

Appendix 2: Sample of Problem Statement (Should Hong Kong Implement Electronic Road Pricing?)

Should Hong Kong implement electronic road pricing?

Road traffic congestion is more and more serious in Hong Kong. In the past ten years, the average traffic speed in different districts in Hong Kong has generally decreased. Traffic congestion has negative impact on cities in different aspects. Therefore, the government launched a three-month public consultation on 'Electronic Road Pricing Pilot Scheme in Central and its Adjacent Areas' in December 2015.

1. Basic information

Source 1

Annual vehicle-kilometres by vehicle type

Vehicle type	Vehicle-kilometres (million)		Change
	2003	2013	
Private cars	4,245	5,315	+25.2%
Goods vehicle	3,592	3,519	-2.0%
Taxis	1,719	2,599	+39.6%
Buses and light buses	1,336	1,312	-1.8%
Motorcycles	298	291	-2.3%

(Source: Transport Advisory Committee, *Report on Study of Road Traffic Congestion in Hong Kong*. Downloaded from http://www.thb.gov.hk/eng/boards/transport/land/Full_Eng_C_cover.pdf)

Source 2

The vehicle composition on three major roads during the morning peak hours (2013)

	Private car	Taxi	Goods vehicle	Bus and light bus	Motor cycle
Connaught Road Central (Central)	22%	**45%**	6%	25%	2%
Harcourt Road (Admiralty)	**44%**	34%	11%	9%	2%
Queensway (Admiralty)	36%	**37%**	6%	20%	1%

Note: Mode with the highest % on each road is shown in bold.

(Source: Transport Advisory Committee, *Report on Study of Road Traffic Congestion in Hong Kong*. Downloaded from http://www.thb.gov.hk/eng/boards/transport/land/Full_Eng_C_cover.pdf)

Source 3

Regions which have successfully implemented the electric road pricing scheme

	Singapore	London	Gothenburg
Area of the charging zone	8 km^2	21 km^2	12 km^2
Exemption guidelines	Only emergency vehicles are exempted from ERP charging. No concession is given to any other type of vehicles.	There are several vehicle types or usages which are exempted from payment or may enjoy concession upon registration.	Exemption is only granted to emergency vehicles, diplomatic registered vehicles, military vehicles, buses over 14 tones and motorcycles.
Effectiveness	The traffic volume entering the charging area during the morning peak period has reduced by 16%, and the corresponding average travelling speed has increased by 26%.	The average speed during the charging hours in the charging area has increased by 27%, and traffic volume during the charging hours has decreased by 16%.	The traffic volume through charging points has decreased by 15% for the morning peak hours, and the average traffic speed has increased by 20%.

(Source: *Electronic Road Pricing Scheme in Central and its Adjacent Areas Public Engagement Document*)

Source 4

Electronic road pricing helps solve air pollution problem.

In Hong Kong, there is serious air pollution, causing great threats to people's health. The Hedley Environmental Index released by the School of Public Health, The University of Hong Kong shows that in 2015, more than 2,100 Hong Kong people suffered from early deaths due to air pollution, resulting in a total economic loss of HKD27 billion.

The *Report on Study of Road Traffic Congestion in Hong Kong* published by the Transport Advisory Committee in 2014 showed that private cars took up 70% of the vehicle fleet in Hong Kong, and the number continued to increase at an extremely high annual rate of 4.6%. The statistics also showed that private cars accounted for about 40% to 70% of the total traffic flow on most of the major roads at peak hours. They were the major causes of traffic congestion in Hong Kong, which have worsened air pollution at street level and threatened people's health.

Environmental group Friends of the Earth (FOE) said that Electronic Road Pricing is based on the 'user pays' principle, and charges are levied on vehicles using the roads in the charging areas during designated periods. The scheme discourages the road users who are not willing to pay the charge from the charging areas to reduce unnecessary traffic demand and to raise the usage rate of public transport.

FOE believes that it is undeniable that traffic congestion problem in Hong Kong is getting worse, resulting in serious air pollution. As shown by the statistic from the Environmental Protection Department, the density of carbon dioxide at street level increased 9% between 2009 and 2013. Moreover, the Air Quality Health Index often shows an extremely high level of health risk in recent years. Taking in too many air pollutants might affect people's health. The devastating effects of air pollution on the people are immeasurable. The government should formulate and enhance various policies to solve the problem of air pollution in Hong Kong.

(Source: Friends of the Earth website, http://www.foe.org.hk/)

Group discussion cards

Anthony Cheung Bing-leung, Secretary for Transport and Housing

I agree / disagree that Hong Kong should implement electronic road pricing.

My concern is _____

Firstly, _____

_____

For example, _____

_____

_____

_____

✂----------

University Professor

I agree / disagree that Hong Kong should implement electronic road pricing.

My concern is _____

Firstly, _____

_____

For example, _____

_____

_____

_____

Legislative Councillor

I agree / disagree that Hong Kong should implement electronic road pricing.

My concern is _____

Firstly, _____

_____

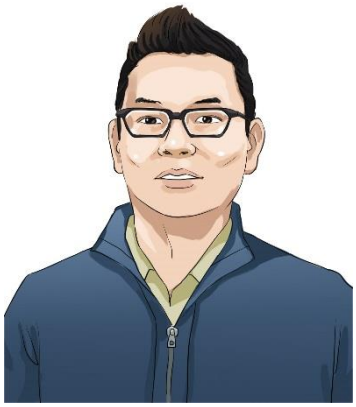
For example, _____

_____

_____

_____

_____



✂----------

Taxi driver

I agree / disagree that Hong Kong should implement electronic road pricing.

My concern is _____

Firstly, _____

_____

For example, _____

_____

_____

_____

_____

Discussion framework

With reference to the discussion results and basic information, answer the following question by using the framework:

If the government implement electronic road pricing, what conflicts may arise among different stakeholders in Hong Kong?

Stakeholder (Stance)	Point of conflict	Explanation

Appendix 3: Sample of Problem Statement (Is Hong Kong an Ideal City to Live?)

Is Hong Kong an ideal city to live?

According to the Global Liveability Ranking 2015 issued by the Economist Intelligence Unit of the Economist Group, Hong Kong's ranking has dropped from 31st last year to 46th this year among 140 cities in the world. The ranking is evaluated in the aspects of stability, healthcare, culture and environment, and education and infrastructure, among which stability accounts for one-fourth of the score. Let us look at the basic information and the views of various stakeholders in the textbook and discuss whether Hong Kong is an ideal city to live:

1. Basic information

Source 1

Global Liveability Ranking 2015 by the Economist Intelligence Unit

Rank	City
1	Melbourne
2	Vienna
3	Vancouver
46	**Hong Kong**
60	Taipei
69	Beijing

(Source: Economist Intelligence Unit)

Source 2

HK tops global competitive list

Financial Secretary John Tsang has welcomed the International Institute for Management Development World Competitiveness Yearbook 2016 which ranked Hong Kong the world's most competitive economy.

According to the yearbook, released yesterday, Hong Kong was ranked top among the 61 economies assessed, followed by Switzerland, the US and Singapore. Hong Kong was ranked second last year.

Mr Tsang noted the institute's high regard of Hong Kong and its recognition of the city's consistent commitment to a favourable business environment, saying, 'We are delighted to see that Hong Kong has regained the title of the world's most competitive economy.' Considering the fierce competition in the global arena, he said Hong Kong will strive to uphold its prevailing competitive edge and continue to search for new growth areas to strengthen its position as an international financial, trading and business centre, and enhance its long-term competitiveness.

The institute also recognized Hong Kong's consistent commitment to providing a favourable business environment, its encouragement of innovation through low and simple taxation, its free flow of capital, and its role as a gateway between the Mainland and the global capital markets.

The report assessed each economy on four competitiveness factors: economic performance, government efficiency, business efficiency and infrastructure. Hong Kong's rankings in government efficiency and business efficiency both continued to be ranked first globally. The ranking in economic performance climbed four places from ninth to fifth, mainly reflecting the more resilient Hong Kong economy compared to others in the challenging global economic environment last year. However, due to changes in the institute's choice of indicators, Hong Kong's ranking in infrastructure dropped from 15th to 21st.

(Source: News.gov.hk)

Source 3

CUHK Quality of Life Index (2002 – 2014)

	2002 Base year#	2005	2008	2011	2013	2014
Health sub-index	21.74	23.16	22.45	22.63	23.39	23.35
Social sub-index	26.09	28.45	26.48	26.51	27.77	26.94
Culture and Leisure sub-index	13.04	12.74	14.18	14.86	15.97	16.18
Economic sub-index	21.74	22.94	20.10	16.79	14.51	14.35
Environmental sub-index	17.39	19.06	20.48	21.05	20.28	20.93

#Base index for comparing future indices

The higher the score, the better the performance of the indicator.

(Source: The Centre of Quality of Life of the Chinese University of Hong Kong. Downloaded from http://www.cuhk.edu.hk/hkiaps/qol/en/qol.html on 16 October 2015.)

Source 4

No hope of retirement for Generation Y?

Sixteen years have passed since the start of the 21st century. The eldest among those were born in the 1990s have already reached 26 years of age. This means that most of the post-90s generation who had been labelled by the older generations as 'queer,' 'lazy,' 'irresponsible', 'playful,' and 'lacking common sense' have stepped into society and started working. A research conducted by a consulting firm found that the post-90s generation is 'unexpectedly hard-working', which has changed the stereotyped views of the elders in them. The research also showed that about 12% of the post-80s and 90s generations around the world think that they will never retire but work until they die.

Hong Kong is facing the problems of workforce reduction and delayed retiring age. A document from the Legislative Council shows that Hong Kong's workforce will peak at 3.71 million in 2018, with no further increase but a steady drop in the years ahead. To cope with the reduction in workforce, the Hong Kong government has postponed the retirement ages of all newly recruited civil servants since 1 June 2015; civilian officers will retire at the age of 65 while disciplined services officers will retire at the age of 60.

Hence, Hong Kong people are not optimistic about getting retired. Ocean Junior Chamber interviewed 738 Hong Kong adults early this year and found that half of the interviewees think that Hong Kong is 'unsuitable' or 'very unsuitable' for retired people. 76.8% of the interviewees said that they will only retire when they have adequate savings.

(Source: Initium Media: A generation with no hope of retirement? (「無望退休的一代？調查表明千禧世代對晚年感到悲觀」). Download from https://theinitium.com/article/20160807-dailynews-work-to-death/ on 8 August 2016. The extract has been edited for setting questions.)

Source 5

2012 Happy Planet Study

Rank	Region/Country	Average lifespan (years)	Life satisfaction (score of 0–10)	Ecological footprint (hectares)
1	Costa Rica	79.3	7.3	2.5
2	Vietnam	75.2	5.8	1.4
3	Colombia	73.7	6.4	1.8
45	Japan	83.4	6.1	4.2
60	China	73.5	4.7	2.1
63	South Korea	80.6	6.1	4.2
90	Singapore	81.1	6.5	6.1
102	Hong Kong	82.8	5.6	5.8
105	The United States	78.5	7.2	7.2
151	Botswana	53.2	3.6	2.8

(Source: The Happy Planet Index Report (2012))

Group discussion cards

Foreigner

I agree / disagree that Hong Kong is an ideal city to live.

My concern is _____

Firstly, _____

_____

For example, _____

_____

_____

_____

_____

✂----------

Ethnic minority member

I agree / disagree that Hong Kong is an ideal city to live.

My concern is _____

Firstly, _____

_____

For example, _____

_____

_____

_____

_____

Businessman

I agree / disagree that Hong Kong is an ideal city to live.

My concern is _____

Firstly, _____

_____

For example, _____

_____

_____

_____

_____

✂----------

Activist

I agree / disagree that Hong Kong is an ideal city to live.

My concern is _____

Firstly, _____

_____

For example, _____

_____

_____

_____

_____

Secondary school student

I agree / disagree that Hong Kong is an ideal city to live.

My concern is _____

Firstly, _____

_____

For example, _____

_____

_____

_____

_____

✂----------

The elderly

I agree / disagree that Hong Kong is an ideal city to live.

My concern is _____

Firstly, _____

_____

For example, _____

_____

_____

_____

_____

Discussion framework

With reference to the discussion results and basic information, answer the following question by using the framework:

'Enhancing Hong Kong' economic competitiveness helps improve people's quality of life.' Do you agree with this view? Explain your answer with reference to the sources and your own knowledge.

Framework	Argument	Explanation
Argument 1		
Argument 2		
Argument 3		
Counter-argument		

Appendix 4: Student Interview Questions (Original)

1. Did you enjoy learning under the PBL approach?
2. Compare PBL with typical LS lesson which one you find more useful and why?
3. How did your teacher support you in learning process?
4. What more support would you like to have?
5. Who did you approach when facing difficulties while learning under the PBL approach?
6. Do you think you have more or less contents to memorise when learning under the PBL approach to prepare for the examinations? Why?
7. Do you find the PBL approach useful?
8. Did you enjoy working in group? Why? Who set up the groups? What is your preference?
9. What was your role in the group?
10. Any difficulties you faced when working in the group?
11. Would you prefer PBL to be used in junior or senior secondary?
12. Is the PBL approach appropriate for Senior LS curriculum?
13. Do you think you learn better under the PBL approach compared to traditional teacher teaching method? Why?

Appendix 5: Student Interview Questions (Modified)

1. Did you enjoy learning under the PBL approach?
2. If yes, what did you enjoy the most?
3. If no, why you did not enjoy learning under the PBL approach.
4. Compare PBL with typical LS lesson which one you find more useful and why? What you enjoyed the most and least in the lesson and why?
5. Did your teacher support you in learning process? How, if she did?
6. What more support would you like to have?
7. Who did you approach when facing difficulties while learning under the PBL approach? Why?
8. Do you think you have more or less contents to memorise when learning under the PBL approach to prepare for the examinations? Why?
9. Do you find the PBL approach useful or a waste of time? Why?
10. Did you enjoy working in group? Why? Who set up the groups? What is your preference?
11. What was your role in the group?
12. Any difficulties you faced when working in the group?
13. Would you prefer PBL to be used in junior or senior secondary?
14. Is the PBL approach appropriate for Senior LS curriculum?
15. Do you think you learn better under the PBL approach compared to traditional teacher teaching method? Why?

Appendix 6: Teacher Interview Questions

Do you attend seminars on Problem Based Learning (PBL)? If yes, how often?

Have you ever received any training on PBL? Please share about it.

Do you enjoy teaching using the PBL approach? Why or why not?

What assured you students have gained knowledge when applying the PBL approach?

Were the students on track when learning under the PBL approach? How do you know?

Was it difficult to handle the students (behaviour, classroom management)? Why? Why not?

Did you face any difficulties when teaching using the PBL approach? If yes, what were they and how did you handle them?

Were you happy with your lesson plan?

Compared to traditional teaching method how was teaching using PBL approach different?

What are the factors affecting you to implement PBL?

Did you achieve the objectives?

Appendix 7: Students' Questionnaire (Original)

Rating scale: 1=Strongly Agree (SA) 2=Agree (A) 3=Disagree (D) 4=Strongly Disagree (SD)

Please **circle** the most appropriate

	SA	A	D	SD
1. I Like PBL as a way of learning. Comments:	1	2	3	4
2. PBL is a more active way of learning than traditional lesson. Comments:	1	2	3	4
3. I have better understanding of the subject knowledge of LS because of PBL. Comments:	1	2	3	4
4. PBL helped me to gain more subject knowledge of LS compared to traditional lesson. Comments:	1	2	3	4
5. I have to memorise less under PBL as understanding increases. Comments:	1	2	3	4
6. PBL stimulated my interest in learning LS. Comments:	1	2	3	4
7. PBL makes learning more fun. Comments:	1	2	3	4
8. I prefer groups to be arrange by the teacher. Comments:	1	2	3	4
9. I prefer allowing students to choose groupmates. Comments:	1	2	3	4
10. I was active in the group. Comments:	1	2	3	4
11. Group dynamics are a barrier to my participation in the lesson. Comments:	1	2	3	4
12. I spoke more than the teacher. Comments:	1	2	3	4
13. Teacher helped to brainstorm.	1	2	3	4

Comments:				
14. Teacher acts as a facilitator. Comments:	1	2	3	4

Thank you! Your kind feedback is highly appreciated!

Ms Catherine K. Kaur ☺

Class: _____ Gender: _____

Appendix 8: Students' Questionnaire (Modified)

Rating scale: 1=Strongly Agree (SA) 2=Agree (A) 3=Disagree (D) 4=Strongly Disagree (SD)

Please **circle** the most appropriate

	SA	A	D	SD
1. I Like PBL as a way of learning. Comments:	1	2	3	4
2. PBL is a more active way of learning than teacher centred lessons. Comments:	1	2	3	4
3. I have better understanding of the subject knowledge of LS when taught using the PBL approach. Comments:	1	2	3	4
4. PBL helped me to gain more subject knowledge of LS compared to teacher centred lessons. Comments:	1	2	3	4
5. I have to memorise less under PBL as understanding increases. Comments:	1	2	3	4
6. PBL stimulated my interest in learning LS. Comments:	1	2	3	4
7. PBL makes learning more fun. Comments:	1	2	3	4
8. I prefer groups to be arrange by the teacher. Comments:	1	2	3	4
9. I prefer allowing students to choose groupmates. Comments:	1	2	3	4
10. I was active in the group. Comments:	1	2	3	4
11. Group dynamics are barriers to my participation in the lesson. Comments:	1	2	3	4

12. I spoke more than the teacher. Comments:				
13. Teacher helped to brainstorm. Comments:	1	2	3	4
14. Teacher acts as a facilitator (helping in brainstorming rather than giving answers directly). Comments:	1	2	3	4

Thank you! Your kind feedback is highly appreciated!

Ms Catherine K. Kaur ☺

Class: _____

Appendix 9: Ethical Clearance from NTU

NOTTINGHAM TRENT UNIVERSITY

Kalwant Kaur
Flat E, 15/F Tower 10
Lepoint, Metrotown II
Tiu King Ling TKO
Hong Kong

Dawn James
Doctoral School Administrator
Nottingham Trent University Graduate School
Burton Street - Chaucer 4711
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Email: dawn.james@ntu.ac.uk

29 November 2016

Dear Kalwant

Re: : Professional Doctorate Ethical Approval Confirmation

Thank you for submitting an ethical approval application.

I am pleased to confirm that your ethics application has been approved.

Student's Name	Kalwant Kaur
Supervisor's Name	Dr Helen Boulton
NTU ID	N0654758
Course	Professional Doctorate EdD
Date of PDREC meeting	28 November 2016
Date Notification sent to student	29 November 2016

Should you have any queries please do not hesitate to contact me either by telephone on +44 (0) 115 848 8154 or email ntuprofdadmin@ntu.ac.uk.

Yours sincerely

Dawn James
Doctoral School Administrator

Nottingham Trent University
Clifton Lane, Nottingham NG11 8NS
Tel. +44 (0)115 941 8418 www.ntu.ac.uk

Appendix 10: Consent Form (Principal)

9th September 2016

Dear Principal,

I am studying Doctor of Education with Nottingham Trent University, UK. I would like to seek your kind approval to conduct a research study in our school. My research study is on Implementation of Problem-based Learning in Senior Secondary Liberal Studies Curriculum. The purpose of the study is to have a better understanding on how students learn when engaged in a new teaching approach.

There shall be no changes made to the teaching methods, problem-based learning approach have often been applied in class. There shall be no changes in quality and quantity of homework, quizzes or marks allocation.

I will need to approach the Year 11 students to complete a 15 minutes' questionnaire for me and I will also need to invite 6 students for an interview on their participation in the Liberal Studies lesson. All the information of the students will be kept confidential, and their name will not be disclosed. Participation is entirely voluntary, and all information obtained will be used for research purposes only and will be destroyed upon the completion of the study. Please kindly note that ethical clearance has been approved by The Nottingham Trent University under British Educational Research Association

Your kind approval will be highly appreciated.

Yours sincerely,
Catherine K. Kaur
Head of Social Science Board
Local Secondary School (Pseudonymised)

Reply Slip

Dear Ms Catherine K. Kaur,

I *allow/ do not allow you to conduct this research study at our school.

(** Please delete if inappropriate.)

Principal's Name: _____

Principal's Signature:_____ Date:_____

Appendix 11: Consent Form (Teachers)

15th September 2016

Dear Colleague,

I am studying Doctor of Education with Nottingham Trent University, UK. I would like to seek your kind assistance to conduct a research study in our school. My research study is on Implementation of Problem-based Learning in Senior Secondary Liberal Studies Curriculum. The purpose of the study is to have a better understanding on how students learn when engaged in a new teaching approach.

I would like to invite you for an interview on PBL and student's participation in the Liberal Studies lesson. The interview will be held at your convenience time and location. All the information shared in the interview will be kept confidential and your name will also not be disclosed.

Please complete the reply slip below to indicate whether you would like to participate in this research study. Participation is entirely voluntary, and all information obtained will be used for research purposes only and will be destroyed upon the completion of the study.

Please kindly note that ethical clearance has been approved by The Nottingham Trent University under British Educational Research Association.

Your kind help is highly appreciated.

Yours sincerely,
Catherine K. Kaur
Head of Social Science Board
Local Secondary School (Pseudonymised)

Reply Slip

Dear Ms Catherine K. Kaur,

I *will / will not participate in this research study.

(** Please delete if inappropriate.)

Teacher's Name: _____

Teacher's Signature:_____ Date:_____

Appendix 12: Consent Form (Parents)

2nd February 2016

Dear Parents,

I am Ms Catherine K. Kaur teaching Liberal Studies to your child. I am studying Doctor of Education with Nottingham Trent University; UK conducting a research study on Implementation of Problem-based Learning in Senior Secondary Liberal Studies Curriculum and would like to invite your child to participate. The purpose of the study is to have a better understanding on how students learn when engaged in a new teaching approach.

There shall be no changes made to the teaching methods, problem-based learning approach have often been applied in class. There shall be no changes in quality and quantity of homework or quizzes or marks allocation.

Your child will only be requested to complete a 15 minutes' questionnaire and may be invited for an interview on his/her participation in the Liberal Studies lesson during lunch time. All the information of your child will be kept confidential, and their name will not be disclosed.

Please complete the reply slip below to indicate whether you would allow your child to participate in this research. Participation is entirely voluntary, and all information obtained will be used for research purposes only and will be destroyed upon the completion of the study.

If you have any questions about the research, please feel free to contact Ms Catherine K. Kaur at 2701 8778. Please kindly note that ethical clearance has been approved by The Nottingham Trent University under British Educational Research Association.

Your kind help is highly appreciated.

Yours sincerely,
Catherine K. Kaur
Head of Social Science Board
Local Secondary School (Pseudonymised)

Reply Slip

Student Name: _____ Class:_____ Class No.:_____

I ** will / will not give permission for my child to participate in the research.

(** Please delete if inappropriate.)
Parent Name: _____

Parent Signature:_____ Date:_____

Appendix 13: Agreement (Confidentially of the data)

8th July 2017

I Ms Lorraine WONG of HKID number XYZ sign this Confidentiality Agreement with Ms KAUR Kalwant, Catherine who I am assisting with to cross check the data. The purpose of this Confidentiality Agreement is to secure, protect and uphold the identity and privacy of the people involved in this research study conducted by Ms Kaur. I agree to avoid from disclosing any information to third parties about the participants involved in this research study to avoid causing them any harm.

_____

Lorraine Wong

Date:

Appendix 14: Ethical Guidelines for Interview

Procedures

- Prepare the room with comfortable temperature, table, and chairs.
- Comfortable and familiar environment for the interviewee
- Welcome the interviewee.
- Offer water.
- Have a casual conversation to build the rapport and make the interviewee feel comfortable (this helps to reduce the bias of power)
- Introduce the study once again.
- Ensure the privacy will be respected and the name shall be kept anonymous.
- Inform that all the data will be delated upon completion of the study.
- Ask if the interviewee have any question and is ready to start the interview.
- Ask for permission to record.
- Test the audio recorder.
- Start the interview.
- During the interview allow the interviewee to suggest and ask questions (to avoid power bias).
- Avoid dragging the interview too long and stop when all questions and important data been collected.

Appendix 15: Student Interview Transcription (Yash)
Researcher: Ms Catherine K. Kaur
Student: Yash

Researcher: Compare PBL with typical LS lesson which one you find more useful and why? What you enjoyed the most and least in the lesson and why?

1. **Student:** I enjoyed the freedom the most when learning under PBL.
2. When the teacher uses PowerPoint there is interaction as the teacher ask questions but discussing with friends, we can hear different viewpoints as it is impossible for the teacher to come up with various viewpoints even though he or she has more experience, but different brains come up with more ideas and we can see the issue from various perspectives.
3. But under PBL after discussion the conclusion is particularly important as some group mates might come up with wrong or inappropriate suggestion or ideas.
4. PBL also provides me with more opportunities to talk and discuss even if I am quiet during discussion my classmates will push me to talk or look at my face due to peer pressure not wanting to lose face or look stupid, I will contribute to the group and since we are friends and it is a small group I would dare to talk more openly.
5. Even if my answers might be wrong, I still give it a shot.

Researcher: Did your teacher support you in the learning process? How, if he/she did?

6. **Student:** Yes, the teacher did provide support but not directly.
7. I like the teacher not giving us answers directly it makes me think more about the issue we are discussing.
8. Furthermore, the conversation during the discussion helps to remember for longer time as it is stuck in the brain.
9. The scaffolding done by teacher makes PBL fun and interesting.
10. I feel if the teacher gives answers directly then it is no point as then I would rather, she uses PowerPoint and I listen to her.
11. PBL helps to train my brain how to think critically.

Researcher: Who do you approach when facing difficulties during PBL? Why?

12. **Student:** Definitely! not the teacher because it is embarrassing, I prefer to seek help from my friends first.
13. If we fail to find answers, then I would approach the teacher.
14. But since in group there are few people and more brains most of the times, we do come up with right answers, but we do later reconfirm with the teacher if needed.

Researcher: Do you do some research work and prepare for the issue you going to discuss?

15. **Student:** Well! we know it is going to be group discussion and we might need to present also hence prior to discussion it is particularly important to have some prior knowledge on the topic.

16. But if it is approach where the teacher uses PowerPoint then I will not bother to prepare myself for the lesson as anyways the teacher is going to give all the information needed and I will be sitting and listening.

Researcher: Do you find the PBL approach useful or a waste of time?

17. **Student:** I find it useful. PBL helps with examination revision. I feel there is less to memorize when we learn from problem statements.
18. During the discussion I am actively involved, which helps me to remember things easily as sometimes we joke around or say silly things and those things get stuck in my brain and makes it easier to recall.
19. If only teacher talk and I listen, I might not be listening I might be daydreaming or even fall asleep.
20. In fact, that would be a waste of time as I will have to go home and revise again but when I am involved in the discussion in solving the problem, I am more alert, awake, and active and I am preparing for my exam every moment.
21. To be honest on the other hand sometimes at times I feel frustrated due to heavy syllabus and too much homework.
22. I just wish the teacher could teach the content knowledge, provide notes, and give answers right away be easier.

Researcher: Did you enjoy working in groups? Why? Who sets up the groups? And what do you prefer?

23. **Student:** I prefer the teacher to group us if we group ourselves mostly, we are sitting with our friends and there is less opportunity to get to know other people and social circle is always small.
24. When we enter the real world there are all kind of people, we need to get out of our comfort zone.
25. Some people are more preserved and shy they sometimes could not find groups to get into or people do not want them.
26. I feel sad for them they are so embarrassed and become even more quiet in the group as they feel they are not accepted by the groupmates they were the leftovers, and someone had to take them.
27. But if teacher group us everyone feels equal, and we get to listen to different opinions. Friends sometimes start talking about other things than the problem statement.
28. PBL gives me more opportunities to talk and discuss even when I am quiet during discussion.
29. Since they are people I know very well and is a small group I would dare to talk more openly. If I do not talk, my groupmates might think I am dumb.

Researcher: Would you prefer the PBL approach to be used in junior or senior secondary?

30. **Student:** I feel in junior secondary teacher should talk more and use PowerPoint as in junior secondary we need to build our content knowledge.

31. We do not have basic knowledge about the issue and anyways what we learn in junior form is too general but in senior form it is closer to DSE which requires critical thinking skills and looking at issues from various perspectives since we are already equipped with basic content knowledge, so it is more suitable to use PBL in senior secondary.

32. With all the content knowledge we can solve the problem I doubt in junior secondary they can do that it might be a waste of time.

Appendix 16: Student Interview Transcription (Simone)
Researcher: Ms Catherine K. Kaur
Student: Simone

Researcher: Compare PBL with typical LS lesson which one you find more useful and why? What you enjoyed the most and least in the lesson and why?

33. **Student:** When teacher give us problems to solve no matter it is a problem statement or news article or questions to discuss it makes the lesson more interesting and since I am engaged in the discussion it helps me to absorb more information and faster.
34. PBL compared to teacher talking using PowerPoint I prefer PBL as we get to discuss more issues and it is fun.

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Researcher: Do you still have a lot of contents to memorize under PBL? Why?

35. **Student:** To be honest there is less to memorize under PBL as it is all about critical thinking and is easier to absorb but when teacher talk, we have to put extra time to go home and revise again as most of the time in class we find it hard to concentrate and are day dreaming sitting there hence under PBL there is less to memorize.

Researcher: Do you think you have more or less contents to memorize when learning under the PBL approach to prepare for the examinations? Why?

36. **Student:** I prefer choosing my own group members as I will be worried what if the teacher put me with people who I do not know, or I do not get along with then I might not be able to communicate or hesitate to be open up or be myself.
37. Which will be a barrier in group discussion and a lot will be missed out. I am a shy member sometimes in group.
38. I write a lot during group discussion I can understand myself better under PBL I understand my potential and weakness.
39. I will hence put more effort and prepare prior to lesson as I want to contribute than just sitting there and make a fool of myself.
40. Everyone is expected to say something in small group.
41. But sometimes group members are not serious about the work and talk irrelevant things then it is a waste of time and I have to go home and revise more and memorize or sometimes some classmates are selfish they know they are with low achievers hence they contribute less.

Researcher: Who did you approach when facing difficulties while learning under the PBL approach? Why?

42. **Student:** I prefer to ask classmates first before asking the teacher.
43. If I ask in front of class I feel I am disturbing the whole class.
44. I might be asking what others already know so I might feel silly or making fun of myself.
45. If I do not find my answers from friends, then lunch or recess time I approach the teacher.

46. I prefer to ask individually this way I can ask as many questions as possible I want, and no one is there to judge me.

Researcher: Did your teacher support you in learning process? How if her/she did?

47. Student: Yes, he did. Step by step make us understand the questions and guide us how to answer.
48. Teacher was extremely helpful.
49. Since it was group discussion, she would be going around stop by every group see what we are doing.

Researcher: Would you prefer PBL to be used in junior or senior secondary?

50. Student: I would prefer in senior as in junior the knowledge is extremely limited and there are too many new subjects to face so I feel PBL be more appropriate for senior.

Researcher: Is PBL appropriate for Senior LS curriculum?

51. Student: I prefer PBL should not be used too often.
52. As everyone's target is to get high grades in DSE hence it is more important to familiarize us to the public exam marking scheme.

Appendix 17: Student Interview Transcription (Uma)
Researcher: Ms Catherine K. Kaur
Student: Uma

Researcher: Did you enjoy PBL? And what do you enjoy in PBL?

53. **Student:** I did enjoy PBL as I can communicate with classmates it is fun solving problems with peers compared to just listening to the teacher, which can be very boring if too frequent.
54. After few lessons it becomes very tiring and difficult to focus if I just must sit and listen. Often, I fall asleep and cannot learn much.

Researcher: Do you think you learn better under the PBL approach compared to traditional teacher teaching method? Why?

55. **Student:** Yes, I learn more under PBL as we communicate with classmates.
56. When discussing different people look from different perspectives it broadens our horizons whereas when only teacher talk the teacher is only one person the ideas, he or she can come up with is also limited and teacher might have her bias on issues.
57. Under PBL we discuss and get to understand in-depth why certain people have certain viewpoints.

Researcher: How did the teacher assist you under PBL?

58. **Student:** The teacher often walks around as we are discussing and listen to what we are saying to make sure we are on the right tract and answering the question.
59. He gives us hints on how to think.

Researcher: Do you find the PBL approach useful or a waste of time? Why?

60. **Student:** Yes, kind of but better than chalk and talk.
61. As if it is mainly teacher talking then I have to go home and spend more time on revision whereas during discussion I am using my brain I can remember easier I have to spend less time on revising and I will have less to memorize so actually it is not really a waste of time.

Researcher: Did you enjoy working in groups? Why? Who sets up the groups? And what do you prefer?

62. **Student:** I prefer teacher to group us as otherwise mostly some students who are good in studies they hang together, and others cannot get to learn from them, or we are stuck with our friends but if the teacher arrange grouping, he mostly uses mixed ability that balances off and everyone get to learn from each other.
63. And we can learn more.

Researcher: What was your role in the group?

64. **Student:** I am doing most of the talking.
65. Cause I want to make use of this opportunity.
66. It is more fun, and I am generally a more active person by nature.

Researcher: Any difficulties you faced when working in group?

67. **Student:** Some students are always quiet because they do not get along with others so if one person is only talking, I don't know if m right or wrong as others are either shy or do not want to contribute and some are just worried, they will give wrong answers and will be laughed at by others.
68. So sometimes it is kind of weird and difficult to work in groups.
69. That is why I believe it is especially important to have mix ability grouping which only the teacher can do.

Researcher: Since the Hong Kong curriculum is so tight do you still prefer PBL or traditional way?

70. **Student:** Depends on the subject.
71. LS is relevant to use PBL as it is about issues and we need to understand the viewpoints of different stakeholders and look from various perspectives hence discussion is very important it is not a subject that can be studied on its own.
72. Memorizing does not help in LS.

Researcher: Do you prefer PBL in junior form or senior form?

73. **Student:** Junior form be better as in junior form we can be trained and get use to talk openly.
74. The confident level can be built we won't be shy now the situation is in junior form we hardly get many opportunities to talk hence in senior form some students struggle to participate in the groups as they are used to work independently.

Appendix 18: Student Interview Transcription (Focus Group)
Researcher: Ms Catherine K. Kaur
Student: James, Peter, and Mel

Researcher: Compare PBL with typical LS lesson which one you find more useful and why? What you enjoyed the most and least in the lesson and why?

75. James: I like the fact that PBL allows me to think critically.
76. Whereas when the teacher uses PowerPoint and talk, I would just see and learn.
77. Under PBL it is interactive we will use more of our brain will have more ideas and easier to remember better than memorizing

78. Peter: PBL allows discussion we have different ideas and points.
79. PowerPoint is just all about memorizing points.
80. I learn more when teacher uses PBL approach.

81. Mel: PBL allows brainstorming and we come up with more ideas we are more active, and it helps with exam.
82. But PBL might not always be good if we could not come up with many ideas or we start talking about things that are not relevant to the topic then it is a waste of time and is time consuming.

83. James: Mel you are right but sometimes we need to know right and wrong.
84. Although LS does not have any correct answers PBL allows us to look at the issue from various stakeholder's viewpoints they all have different viewpoints there is nothing like right or wrong, so it is not really time consuming but learn about the issue more in-dept.

85. Peter: I agree it helps to learn more.
86. For instance, some classmates agree with reclamation while some are very environmentalist, they might not agree it allows us to see one issue from various perspectives.

Researcher: Do you think you have more or less contents to memorize when learning under the PBL approach to prepare for the examinations? Why?

87. Peter: Sometimes the classmates might not give right answers, but everyone is trying their very best and is active I get to understand the issue in depth by listening to viewpoints of different people hence I learn more and better.
88. I feel under PBL I have less to memorize.
89. I still remember very well what we discussed last year when we did the module on Hong Kong Today quality of life we discussed about minimum wage.
90. We discussed it from various stakeholders' viewpoints hence I feel during PBL I am already preparing for my exam and I need less time to do revision.

91. **Mel:** When classmates share, I like asking them why they think like that or such way.
92. Furthermore, when we are casually talking about the issue it is easier to remember and debating makes it even more interesting and the brain remembers not only the facts, but we remember the framework and the conversation.

93. **James:** When we talked about organ transplant, we recalled the recent issues from the newspaper then we discussed that issue in detail such as who was responsible why it happened mostly, I remember the PowerPoint was about something else but we could link it to other news and recent news this teaching method allows me to learn more.

94. **Mel:** I agree under PBL there are less contents to revise but PBL also reduces my area to study as under PBL during discussion I have already cover lot of ideas and points that I don't have to search for more information for my exam revision and sometimes in exam I only do mind map so not less to memorize but things are already in brain, so it is less stressful.

95. **James:** I think there is less to memorize.
96. Since I contribute a lot during the discussion, I have better understanding of the content knowledge whereas if teacher uses PowerPoint it is boring, I will be merely copying or listening or might even be daydreaming eventually.
97. I might have to memorize more but under PBL we all are attentive and awake in class hence there is less to memorize.

98. **Mel:** I agree under PBL it is less likely that we do not pay attention as everyone has a role to play and no one want to look stupid in class hence we are forced to be attentive.

99. **Peter:** Looking at PowerPoint or the teacher talking is very boring I often fall asleep but discussions under PBL makes me contribute and there are less chances for not participating

100. **James:** In traditional teaching teacher cannot cater everyone is needs hence sometimes the teacher ignores silly questions of the students but they might not be silly to some students probably many might be having same question to ask but in PBL those questions also get to be answered and clarified.
101. I personally feel daydreaming is more of an attitude towards learning.
102. Some students just do not have interest in studying no matter how interesting it is they will never contribute.

Researcher: Did your teacher support you in the learning process of PBL? And if her/she did how do her/she helped you?

103. **Peter:** The teacher guided if we are stuck and do not understand.
104. Some key concepts we do not know then teacher would clarify and make sure we are on right track.
105. Teacher often guide us on how to discuss and make us understand the questions to the depth if we are discussing something irrelevant to the question.

106. Sometimes we discuss in very general and straight manner teacher will scaffold us and guide us to think outside the box and help us to look from various perspectives.

107. James: Similarly, to what Peter said often while discussing we are off the topic the teacher will guide us and put us back on track that helps us wasting time discussing on irrelevant stuff.

108. Mel: I feel the teacher often support us in discussion especially when we do not understand the keywords or terms for instance recently, we were learning about public health we had difficulty in understanding the question the teacher then used keywords to guide us rather than giving answers directly and the teacher also pushes those passive ones to talk.

Researcher: Would you prefer PBL to be used in junior or senior secondary?

109. Mel: I feel at junior level PBL is better because we need to build a strong base and general knowledge.
110. Through discussion we equip ourselves with lot of information.
111. However, in senior secondary we need analytical skills to write and think broadly.
112. So, I feel PBL is more appropriate in junior and traditional teaching method is more appropriate at senior level.
113. Furthermore, at senior level the syllabus is very tight, and time is limited, and contents are too much within short period of time we need to cover a lot of issues so issue base approach we can cover more in short time.

114. James: I disagree with Mel.
115. I believe we should use traditional teaching in junior secondary and PBL in senior as in junior our life experience and knowledge is limited hence PowerPoint / traditional teaching will give us more content intake which we can apply in senior form to discuss issues in groups.
116. In junior secondary we cannot understand the questions properly as content knowledge is very limited and in senior secondary DSE is all about issues and it is not possible to discuss each and every issue in class hence through group discussion using PBL approach we can cover various issues and topics within a short period of time.
117. Since we have good content knowledge in junior secondary already this can be applied to answer the questions in senior secondary and allow us to think from different perspectives.

118. Peter: LS is not content based it is an issue based hence PBL is the only best approach no matter junior or secondary it allows us to think more points and plus teacher guidance and scaffolding.
119. In traditional approach we input only what teacher want us to know but via PBL we learn more as more brains are working together to give input.
120. PBL excites us and we can come up with many ideas and suggestions which even the teacher would not have thought of.

Researcher: Who did you approach when facing difficulties while learning under the PBL approach? Why?

121. **Mel:** Mostly I prefer approaching friends first.
122. Although it is time consuming asking friends as we will take longer time to solve the problem but once we find the solution, we will remember it for longer time because we worked on the solution together but if we ask the teacher and just copy down, we will forget very soon.

123. **Peter:** I prefer approaching the teacher.
124. After all the teacher is more experienced and it saves time and if we solve by ourselves the answer might not be right, or we might assume it is correct, but it might be a wrong answer.
125. In secondary 4 I had IES LS questions I asked the teacher focus questions the teacher did not give me direct answers, but she guided me how I can find my answers.
126. Directly giving us answers can save us time.
127. It took me long to sort out my focus questions for IES.

128. **James:** I also prefer approaching the teacher.
129. After all teacher is more experienced and the answer is surely correct and easy to remember.
130. Furthermore, teachers anyways do not answer right away they do make us think and scaffold till we automatically come up with right answer.
131. However, before the exam I will not want to waste time.
132. But if I have lot of time I would love to sit and discuss with my friends and try to solve the problems myself.

Researcher: Alright! Now we are going to discuss about group discussion do you enjoy working in the group and mostly what is your role in the group? Do you prefer choose group members yourself or you prefer the teacher to choose for you and why? Which one do you prefer more, and does it affect your learning in PBL?

133. **Peter:** I personally like working in groups because I feel like having more power and confident in answering the questions as I am shy to answer in front of the whole class.
134. I am more active when working in a small group.
135. I often play different role sometimes I am a leader, which enhances my leadership skill.
136. During the presentation it is better if the group members are chosen by us then by the teacher.
137. It is more convenient to contact members since we know each other very well it is more effective.
138. But for normal discussion in class, I do not see the need to group with friends I do not mind working with other members and get to know them.
139. If we keep working with same people, there is nothing new to learn.

140. **James:** I like working in groups as it allows us to intensively discuss issues in more in-depth manner and we may discuss till we understand.
141. It teaches us collaboration and interpersonal skills.

142. Everyone works together we learn to work with each other, and we learn more as we share information.
143. However, sometimes it leads to conflicts or one member's mistake could ruin entire group.
144. For examples once after discussing the issue we had to present and one of our group members lost his USB which led to other members had to help him do his work as time was not enough for him to finish off the entire work before the due date hence mistake of one person or carelessness could affect everyone in the group it is a very interdependent thing.
145. That is the only thing I do not like about working in groups.
146. Some members are slow and drag but we must allow them to take part even if they are slow.
147. It is more fun working together than working alone.
148. As working alone can be boring.
149. I prefer to select members by myself then I can pick people who are reliable, and I get along with.
150. I am very scared of being grouped with people I do not get alone with sometimes people are shy or drag things and if you are not familiar with the person it is very difficult to ask someone to work or take your advice, but friends take it casually and it is more relaxing and less stressing.
151. If the groupmates are not close friends when they keep giving silly or wrong answers or suggesting it is difficult to tell them.

152. Mel: I also enjoy working in group.
153. We may go off the topic but when we are discussing issues we may come up with many ideas even if they are not very relevant, we may still discuss various issues which could be helpful in LS.
154. We do not have to be formal when discussing in group compared to talking in front of whole class, we have to watch what we are saying.
155. I prefer teacher to group us as then it is more convenient and less waste of time in selecting our own members, we may get to know different people their ideas.
156. However, during the presentation, I prefer working with friends as then work can be done fast and more effective.
157. When you know group members you enjoy working on presentation as you will not hesitate or contact them even off hours or late hours there is no formality or hesitation

Researcher: Will you prefer more of PBL in the future to assist you for DSE?

158. Mel: When it comes to DSE I am not very keen with the PBL approach because my target is to score high marks and sometimes, I feel we spend too much time on one issue in PBL and because some classmates are slow it slows down the whole group and I feel my time is being wasted.

159. James: Agree with Mel and to be honest we do not have that much time to go home and search for information there are lot of other subjects' homework to do as well.
160. Group work sometimes takes up lot of time and DSE is more of an individual thing.

161. Peter: If we only have smart ones in the group then PBL can assist in learning LS as we can discuss many issues and look from various aspects in short period of time.

162. But if we have low achiever then it slows down everyone.

163. Agree with Mel it slows down the high achiever because of some lazy classmates and DSE have so much to cover.

Appendix 19: Teacher Interview Transcription (Wera)
Researcher: Ms Catherine K. Kaur
Teacher: Wera

Researcher: Do you attend seminars on PBL? If yes, how often?

164. **Teacher:** I do attend workshops on and off and mostly are on issue-based approach.

Researcher: Have you ever received any training on PBL? Please share about it.

165. **Teacher:** Yes, the one offered by the HKU. The 3-day workshop

Researcher: Do you enjoy teaching using the PBL approach? Why or why not?

166. **Teacher:** Yes, I like students' creative and innovative ideas which always inspire me.
167. And I believe they would truly obtain the knowledge and skills during the process they construct it.
168. And they would become more independent and active learners in long run. PBL is very interactive it is learning by having fun for both teacher and the students.
169. Chalk and talk make me feel a boring person and it is tiring as well talking the entire lesson.
170. Furthermore, it is no point for me to just teach when there is no learning happening or I am not sure if students are learning as sitting there does not indicate they are listening to me they could be day dreaming but under PBL approach they are actively involved.
171. Not even one student is left behind everyone have something to say that is the most beautiful part of PBL.

Researcher: Did you achieve the learning objectives under the PBL approach?

172. **Teacher:** Yes, kind of in fact students did better than what I expected but it required lot of encouragement and positive feedback assuring them they are doing a good job.
173. I believe students truly obtain more knowledge and skills during the process of PBL.
174. They are more independent and active learners under PBL.
175. However, at same time it is time-consuming also.
176. I normally list out the objective to the students before I start the PBL approach this way they know what I want them to learn and discuss.
177. Furthermore, our guiding worksheets are detailed also.

Researcher: What assured you students have gained knowledge when applying the PBL approach?

178. **Teacher:** Teaching experience with observation of students' engagement and performance, their interaction and behaviour in the class, and of course from their performance of guided worksheets and homework.
179. Student-centred teaching approaches are not easy to implement in the classroom. If instructors do not have enough guidance or support, they can easily fall into the trap of thinking that just because these approaches are interesting and engaging, students are

learning the things they need to learn. Students could be discussing other stuff irrelevant to the problem statement and not focused at all.

180. We as teachers need to reflect and adjust the teaching methods usually after each lesson so that we can know if our students learn effectively in that particular way.

Researcher: Did you face any difficulties when teaching using the PBL approach? If yes, what were they and how did you handle them?

181. Teacher: Yes, the abilities of students vary ...easy to be dominated by few or dead air.

182. Better arrangement of the groupings is needed, mixed ability of the students in a group may help.

183. While some students are not willing to participate but waiting for the model answer.

184. Giving them more instructions, try to arrange active learners in each group to help others.

185. Implementing more practices in junior classes so that students can get used to this type of learning method when they enter senior secondary.

186. Some students lacked knowledge on the issue seem like not many of them watch news or aware of daily issues hence lot of time was spent on discussing the background of the issue.

Researcher: Were you happy with the lesson plan?

187. Teacher: Yes, pretty much.

188. PBL is a good way to help students to learn such an interdisciplinary subject like LS.

189. However, before discussion students should be given some background information and glossary list.

190. I feel Students did better than what I expected but it required lot of encouragement and positive feedback assuring them they are doing a good job.

191. I believe students truly obtain more knowledge and skills during the process of PBL. They are more independent and active learners under PBL.

Researcher: Compared to traditional teaching method how was teaching using PBL approach different?

192. Teacher: Students are the self-directors and gain knowledge on their own.

193. They decide on what they wish to explore and learn.

194. Teachers are facilitators only teachers do not really need to pass down subject content.

195. I think PBL is one of the ways of teaching LS to let students develop skills of critical thinking and enhance active learning attitude.

196. During traditional lessons students are more like receivers and obtain the knowledge directly form teachers which is not in line with LS curriculum.

Researcher: Were the students on right track when learning under the PBL approach? How do you know?

197. Teacher: On and off after all teenagers.

198. By regular assessment e.g. short quizzes and peer assessment from each group after group discussion

Researcher: Was it difficult to handle the students (behaviour, classroom management)? Why? Why not?

199. Teacher: No, not difficult as they can talk what they like .... but guideline must be provided to guide them to be on the right track.
200. Sometimes while students not getting used to this type of learning way.
201. They may find it difficult, boring, or too lazy to participate then they may just give up.
202. Anyways in senior secondary there is not much classroom management issue students are very much aware of public exam.
203. So, the pressure to study well is automatically there.

Researcher: What are the factors affecting you to implement PBL?

204. Teacher: Syllabus and public exam … too time consuming .... cannot catch up with the syllabus the workload is too heavy but proper distribution of workload among teachers may help.
205. Yes, regarding problem statement I was not sure how ill-structured the problem statement should be or how much information should be given to the students as the students are diversified in abilities.
206. As more ill-structured the problem statement is less appealing it is to the students.
207. Furthermore, LS consists of 6 modules and all modules are taught using recent issues related to the module.
208. Hence, having a Geography background I am not greatly confident with teaching modules like Public Health and Personal Development and Interpersonal Relationship

Appendix 20: Teacher Interview Transcription (Kael)
Researcher: Ms Catherine K. Kaur
Teacher: Kael

Researcher: Do you attend seminars on PBL? If yes, how often?

209. Teacher: Yes. I do often attend the workshops offered by the EDB on how to answer LS questions which are all issued based so very much like PBL.
210. I have to attend seminars organised by COTAP to keep myself updated on the issues and to learn how to deliver the knowledge to the students and prepare the content materials as using textbooks is not sufficient for teaching LS.

Researcher: Have you ever received any training on PBL? Please share about it.

211. Teacher: Yes, it was a program offered by a tertiary institute for teachers.
212. In the training, teachers were advised to guide students to identify "Fact" or "Comments" on specific articles.
213. PBL topics were identified through this process.

Researcher: Do you enjoy teaching using the PBL approach? Why or why not?

214. Teacher: When students are devoted to their work, the process of having PBL learning with students is enjoyable.
215. Teachers and students work together to explore interesting issues.
216. Otherwise, it requires lot of effort to get them engaged in the task.
217. Some might not take it as learning but more of fun activity and do time pass chatting things not relevant to the topic.

Researcher: Did you achieve the learning objectives under PBL?

218. Teacher: Most of the time yes. Even low achievers could acquire some basic steps of carrying out an enquiry study, e.g., data collection, data processing and analysis the worksheets are essential to guide the students, especially low achievers.
219. In fact, go beyond that basically it enriches learning and the pattern of working in group helps them to achieve by helping each other.
220. Students were engaged and motivated in my class.
221. PBL is a positive reinforcement to help students to learn better.
222. The nature of the PBL approach using problem statement motivates students to brainstorm and search for answers by themselves.

Researcher: What assured you students have gained knowledge when applying the PBL approach?

223. Teacher: Frequent reporting by students is a must to assure the progress and quality.
224. Through frequent discussion with students, teachers understand the level of knowledge and skill acquisition.

225. The quality of work (presentation and mind maps)

Researcher: Did you face any difficulties when teaching using the PBL approach? If yes, what were they and how did you handle them?

226. Teacher: The planning stage of problem statement is critical.
227. Students often over-simplify the topics.
228. Guiding them to a problem statement of appropriate and reasonable level of difficulty is often challenging.
229. Generating problem statement was time consuming and I feel to create a meaningful and authentic problem was exceedingly difficult.

Researcher: Compared to traditional teaching method how teaching using the PBL approach was different?

230. Teacher: PBL teaching stresses so much on face-to-face discussion with individual student.
231. Consultation time per students is often not quite enough as students have different ideas.
232. The discussion on one issue could take couple of lessons to cover compared to traditional teaching approach.

Researcher: Were the students on right track when learning under the PBL approach? How do you know?

233. Teacher: mostly yes except for the low achievers.
234. Students were engaged and motivated in my class. PBL is a positive reinforcement to help students to learn better.
235. The nature of the PBL approach using problem statement motivates students to brainstorm and search for answers by themselves.
236. They distract those working or sometimes stay noticeably quiet.
237. I would say at the beginning is tough but after 2nd problem statement things start getting better.
238. Students understood the pattern and the goals that they need to achieve.

Researcher: Was it difficult to handle the students (behaviour, classroom management)? Why? Why not?

239. Teacher: No. The most challenging part was to arrange appropriate tasks to engage the students which means to set appropriate level and theme of problem statement.
240. Only an interesting one will keep them engaged and not too difficult not too easy for them and something related to their daily life.
241. Behaviour wise not obviously few low achievers have to be kept reminded.
242. Once students can sit in groups, they take the lesson casually and start socialising, and I have to keep reminding them to focus on their work.

Researcher: What are the factors affecting you to implement PBL?

243. Teacher: The requirements set by the authority.
244. The curriculum contents are too wide if I use PBL frequently I am worried I will not be able to finish teaching the syllabus before the public examination.
245. The curriculum contents are too wide if I use the PBL approach frequently I am worried I won't be able to finish teaching the syllabus before the public examination.

Appendix 21: Sample of Students' Work (PBL)

Discussion framework

With reference to the discussion results and basic information, answer the following question by using the framework:

'A green life will improve the quality of life of people in Hong Kong.' Do you agree with this view? Explain your answer with reference to the sources and your own knowledge. (8marks)

Disagree:

Framework	Argument	Explanation
Argument 1	HK is shopping paradise	- Materialistic life (like shopping) - like shopping - People will be bored - QoL ↓
Argument 2	The problem in HK for ↓ quality of life is property of price	- Expensive living cost (Speculation) - Property price ↑ - Inflation - Disparity (Social division) - Political factor (universal Suffrage)
Argument 3	Economy ↓	- Tertiary Industry - Tourism (Main income) × Eco-tourism → Tours (Eating, Shopping, light Shows) - Shop [illegible], laid off, Income ↓, [illegible] ↓.

Agree

1) × build incinerator
↓ landfill burden

2) ↓ in conflict
× conflict on building incinerator.

3) Increase environmental awareness
- × buy unnecessary stuff
- ↑ disposal income
- ✓ buy property

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5

With reference to the sources, suggest some measures that might be adopted to protect labour health in Hong Kong. (8 marks)

Stakeholder (Stance)	Controversial point	Explanation
legislation (standard working hour)	standard working hour + annual leave ↑ (12-16 days) + motherlity leave (2 weeks → ↑) domestic helper	Setting up laws in Hong Kong can avoid labour working overhours. Even without commission, Hong Kong workers often work for 9-10 hours to show their diligence. The long working hour harm both physical and mental health of Hong Kong labour. By implementing standard working hour, Hong Kong people will have to work in only a standard duration. Therefore, the effect of working overhours can be limited and Labour health can be protected.
promotion (employers)	government promote employers, recommand on standard working hour (1 hour for lunch) ↳ not to work + break time / tea time ↳ still have to work + increase labour (due to overwork) + exercise	Government should strength the promotion of labour right to protect labour health in Hong Kong. To employers, advertisement can raise their awareness on labour health, which can vary the working efficiency. So employers can learn the importance to protect their labour. Also, employees would learn to disclose the malicious act of their boss. By promoting the methods to stop exploiting workers, Hong Kong labours would learn to protect their health at the same time.
education (public)	government responsibility (labour department) occupational health professional educate employers + employees on working environment advice on equipments e.g. chairs health issue e.g. mark wet floor, using laser-printer	Education can plant knowledge deep in the mind of next generation. Educating young kids can prevent both employer and labour in the next generation to exploit or being exploit. Young kids can learn to respect others, or to protect themselves from long working hours. Also, this may raise awareness about health for the next generation, so labours will learn more to work in a safer way and physical officers may be more willing to use computer in an appropriate way. Therefore, labour health can be protected by educating next generation on labour rights.

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Appendix 22: Sample of Students' Work (Traditional Teaching Method)

Discussion framework

With reference to the discussion results and basic information, answer the following question by using the framework:

'A green life will improve the quality of life of people in Hong Kong.' Do you agree with this view? Explain your answer with reference to the sources and your own knowledge. (8 marks)

Framework	Argument	Explanation
Argument 1	X improve QOL	- ↓ QOL → expensive property price in Hong
	- X build incinerator	- ↓ landfill burden - ↓ waste
Argument 2	- Materialistic life	- HK is a shopping paradise - like spending money - shopping is incentive to people
	- ↓ conflicts	- X conflict on building incinerator
Argument 3	[illegible]	- ↓ social gathering (cultural)
	- ↑ environmental awareness	- ✓ buy & use - X unnesscessary stuff - ↑ disposal income

D

A

4X/8

With reference to the sources, suggest some measures that might be adopted to protect labour health in Hong Kong. (8 marks)

Argument (Government)

~~Stakeholder~~ (Stance)	Controversial point	Explanation
legislation		Standard Working Hour ↳ Annual leave 12-16 days.
Promote to the employers		Government → employers ↳ standard working hour ↳ 1 hour lunch ↳ break time / tea time ↳ increase labour # balance work & life
education on mental health		Government → labour department ↳ Occupational Health professional ↳ give advice to both employees and employers. ↳ give advice : chairs.

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