



TLS4029 (02E)

HONOURS PROJECT II

**To Flip or Not to Flip:
Effectiveness of the Flipped Classroom Model on
Students' Self-directed Learning in General Studies**

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Word Count: 7465 words

Submission Date: 10/05/2020

TABLE OF CONTENTS

	Page
Declaration and Acknowledgement	4
Abstract	5
1. Introduction	6
2. Literature Review	6-11
2.1 Background of Flipped Classroom	6-7
2.2 Definition and Barriers of Implementing of Flipped Classroom	7-8
2.3 Concept of Self-Directed Learning	8-9
2.4 Similar Researches about Flipped Classroom and Self-Directed Learning	9-11
3. The Present Study	11-13
3.1 Background of the Study	11-12
3.2 Significance and Potential Implication of the Study	12
3.3 Research Questions	12-13
4. Methods	13-16
4.1 Research Design	13
4.2 Setting	13-14
4.3 Sampling Method and Participants	14-15
4.4 Procedures	15
4.5 Data Analysis	16
5. Findings	16-23
5.1 Responses to students' self-directed learning via flipped classroom	16-18
5.2 Responses to the limitations of flipped classroom	18-23
6. Discussions	23-29
6.1 Relationship between Flipped Classroom & Self-directed Learning	23-26

6.2 Limitations of Implementing Flipped Classroom	26-29
6.2.1 First-order Barriers: External Limitations	26-27
6.2.2 Second-order Barriers: Internal Limitations	27-29
7. Suggestion	29-32
7.1 Addressing Faculty Challenges	29-30
7.2 Addressing Students' Motivation Challenges	30-31
7.3 Addressing Technological Issues	31-32
8. Limitations	32
9. Conclusion	33
Reference	34-41
Appendix 1: Interview Questions	42
Appendix 2: Interview Transcripts	43-56

Declaration

I, Cheung Suet Ting, declare that this honors project entitled “To Flip or Not to Flip: Effectiveness of the Flipped Classroom Model on Students’ Self-directed Learning in General Studies” is my own work under the supervision of Dr FONG Wai Tsz Ricci, and that it has not been submitted previously for examination to any tertiary institution.

Acknowledgement

I would express my gratitude to my supervisor Dr. FONG Wai Tsz Ricci and Dr. Benjamin Chang, for the constant support, encouragement and guidance they have provided. The contribution of all the participants involved in the research is also greatly appreciated.

To Flip or Not to Flip:
Effectiveness of the Flipped Classroom Model on Students' Self-directed
Learning in General Studies

Abstract

This is a study investigating the effectiveness of flipped classroom model to students' self-directed learning in General Studies lessons of Hong Kong senior primary students. In specific, this research aims to conduct a case study at a local primary school for studying: (1) the effectiveness of flipped classroom to develop students' self-directed learning; (2) and the limitations and suggestions for implementing flipped classroom in the Hong Kong context. A sample of six teachers and one school principal have participated in the research by having the interview sessions, which is analyzed by the grounded theory approach via open coding and thematic analysis. The potential implication of this study is expected to offer pedagogical insights on adopting flipped classroom in primary schools on both theoretical and practical levels for future developments, as well as raises the awareness of developing students' self-directed learning with this approach.

Keywords: flipped classroom model, self-directed learning, e-learning, senior primary students, General Studies

1. Introduction

The current educational issues in Hong Kong are interrelated. The direct instruction pedagogy and the tight academic schedule centralize on examining students' proficiency on technical knowledge. Thus, pupils are cultivated to practice memorization and rote learning rather than find out the answers actively, which gradually reduce learners' autonomy and self-directed learning skills. At the same time, with the vastly changing in information and technology in the 21st century, a form of active pedagogy flipped classroom model emerges in response to the needs of times. Flipped classroom model has been officially proposed by the Education Bureau and became the recommended teaching approach since the launch of Fourth Strategy on Information Technology in Education (ITE4) in the 2015/16 school year. This approach allows students to acquire fundamental knowledge via online materials out of class and work on higher-order cognitive activities in class (Gençer, Gürbulak & Adiguzel, 2014). Hence, this study aims to investigate the effectiveness of flipped classroom to students' self-directed learning in General Studies lessons from school teachers' perspectives; and analyze how to implement an ideal flipped classroom according to the case study.

2. Literature Review

2.1 Background of Flipped Classroom

In this 21st century, the advancement of information and communication technology paves the way for the development of flipped classroom during the present information age (Johnston, 2017). Hamdan et al. (2013) assert that flipped classroom is the best instructional approach which makes good use of technology for establishing effective learning environments in class as well as transmits the learning responsibility from teachers to learners (Bergmann, Overmyer & Wilie 2011).

Therefore, more and more educators and researchers investigative that flipped classroom can be an alternative of traditional classroom (Keengwe, Onchwari & Oigara, 2014).

2.2 Definition and Barriers of Implementing Flipped Classroom

The term “flipped classroom” came into common use since early 2000s and after that many definitions of flipped classroom were generated in literature (Ozdamli & Asiksoy, 2016). The simplest explication of flipped classroom is “what was usually done as assignment is now finished in class, and what was usually done in class is now done for assignment” (Bergmann & Sams, 2012). Moravec et al. (2010) compares the different practices between the traditional education approach and flipped classroom model in the following figure 1. With the traditional classroom, the students will attend a face-to-face lecture for comprehending the subject or taking part in class activities with the guided instruction. After the class, teachers will assign homework to consolidate students’ learning. Whereas with the model of the flipped classroom, it is a student-centered learning method with involving two main parts: having the individual learning to acquire fundamental information out of school and carrying on different higher-order cognitive activities interactively in the lessons (Bishop & Verleger, 2013). The figure also shows the teachers are no longer a direct person to teach, but to use various technologies or offer flexible learning method such as lecture videos or audio (Ikpeze, 2015). As a result, the educators can spend time to reinforce the course with different learning activities in school (Hamdan et al., 2013), which promotes the teaching efficiency by maximizing the time spend on each student (Milman, 2012; Hamdan et al., 2013; Reidsema et al., 2017).

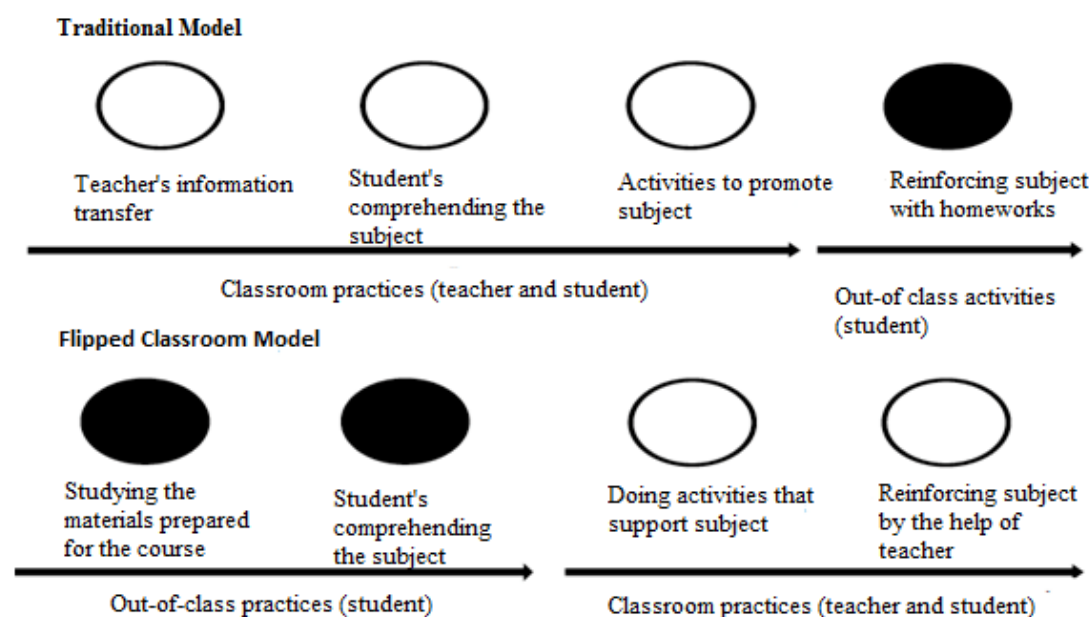


Figure 1. Comparison of traditional education model and flipped classroom model

(Moravec et al, 2010)

According to Ertmer (1999), there are first-order and second-order barriers to employ flipped classroom model. The former involve the external challenges such as lack of resources and technological access, while the latter consist of the internal challenges posed by instructors' beliefs, attitudes and self-confidence. Ertmer (2005) points out that the second-order barriers should be the tackled first, because teachers tend to rely on their past experience and current conception when facing with the foreground of adopting innovative pedagogies (Fullan, 2015). Thus, they may not be willing to apply flipped teaching even though all external barriers are addressed (Ertmer, 1999; Ertmer, 2005).

2.3 Concept of Self-Directed Learning

The earlier conceptual framework of self-directed learning illustrates the process-oriented idea on self-monitoring and self-regulating (Candy, 1991; Brockett

& Hiemstra, 1991; Garrison, 1997). Self-directed learning is “a process in which the individual takes the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes” (Knowles, 1975, p.18). Moreover, Song and Hill (2007) define self-directed learning as an individual characteristic or ability that emphasizes on learner’s autonomy in the whole learning procedure. According to these literatures, it is discovered that self-directed learning is a process which involves the learners engaging in self-direction of their learning with personal autonomy.

Apart from defining self-directed learning as a process, some literatures also point out that it is skills-based represented by students’ performance (Azevedo & Cromley, 2004; Dabbagh & Kitsantas, 2012). Corno (1992) claims that self-directed learning recognizes the important role of motivation, which drives the decision to participate and sustains the willingness to achieve the goal (Garrison, 1997). Furthermore, when self-directed learning is linked with the concept of self-management (Garrison, 1997), individual autonomy, goal setting (Candy, 1991) or one’s actively undertake the responsibility for learning (Brockett & Hiemstra, 1991), where the focal point is on the learning motivation, methods and resources. Hence, self-directed learning is located as an attribute of one of the 21st century skills by some literatures (Jaquith & Hathaway, 2012), which can practice learners’ independence in setting learning objectives as well as deciding how to approach the learning tasks during the process of self-directed learning (Lyman, 1997).

2.4 Similar Researches about Flipped Classroom and Self-Directed Learning

Supported by The Hong Kong Teachers' Centre, two primary school teachers Jiabao

Zheng and Jiarong Wen have conducted a study about the relationship between flipped classroom and students' self-directed learning through implementing flipped classroom approach to primary five students (Zheng & Wen, 2016). The target students were required to watch instructional videos and answer questions in a pre-class preparation platform EDpuzzle. Zheng and Wen discovered the right answer rate in the online platform was constantly raising from 56% to 87.5%, because the interviewed students expressed that they were able to watch the video repeatedly or search the additional information on the Internet when they did not understand. Thus, Zheng and Wen thought the students became more serious in previewing the lesson owing to higher awareness of self-directed learning. Besides, the result showed most of the students accomplished the Zimmerman's self-directed learning cycle, including self-evaluation, goal setting, selection of appropriate strategy and supervision of learning progress (Zimmerman, Bonner & Kovach, 1996). Some interviewed students indicated that they were allowed to monitor their learning progress and exchange opinions with classmates. Therefore, Zheng and Wen speculated that the flipped classroom could nurture students' ability of independent learning, which is the significant element of self-directed learning (Nenniger, 1999). This recent research demonstrates the application of flipped classroom can enhance students' self-directed learning skills in different level. Yet, Zheng and Wen's study focused on the e-learning platform or video watching. They might neglect the in-class activities which is also an important part of flipped teaching approach, because it can reinforce the subject by the help of teachers during the classroom practices.

There is another recent study by Cheung and Jong (2016) that examined teachers' driving forces and concerns of employing flipped classroom in K-12 classroom under the shift of educational paradigm. Their research subjects were the teachers who

wanted to “flip” their courses but had not succeeded yet. Through conducted an interview with three secondary school teachers, Cheung and Jong discovered that the popularization of information technology, especially mobile devices and related teaching software have promoted the development of flipped classroom. In their study, the teachers are willing to develop flipped teaching because they are familiar with the required computer skills on flipped classroom. Yet, the researchers found that even though they have willingness and skills of implementing flipped classroom, other variables including cultural aspects and teachers’ supports still affect the results. Since Hong Kong’ cultural and educational context famous for Performancism, teachers are not confident to improve students' public examination results with flipped teaching. Thereby, the researchers expect the policy makers can invest more resources to enhance teachers’ confidence of applying flipped classroom. However, they did not provide concrete reasons how or why resource investing can heighten teachers’ confidence on developing flipped teaching. After reviewing the related literature and researches about the flipped classroom model and self-directed learning, the following part will introduce the research design of the present study.

3. The Present Study

3.1 Background of the Study

In the Hong Kong school context, the examination-oriented culture emphasizes on students’ proficiency of textbook knowledge (Su, 1996). Since Hong Kong’s curriculum is highly standardized in the exam-oriented education system, students always require the teachers dole out the answers directly as they are eager to know the model answers instead of finding the answers by themselves (Ip, 2003). However, it is important for the students to have self-directed learning skills through bearing the learning responsibility or even creating the knowledge by themselves actively. As a

result, flipped classroom model can be a breakthrough to cultivate students taking ownership of their learning by previewing the lessons under the flipped classroom (Waldrop & Bowdon, 2015).

3.2 Significance and Potential Implication of the Study

This study is significant and worth investigating as it serves as a contribution to the research of flipped classroom model, which has relatively few scholars to study in the Hong Kong context. It offers insights on implementing flipped classroom approach in primary schools on both theoretical and practical levels for future developments, as well as raises the awareness of developing students' self-directed learning in classroom context with this approach.

On the classroom level, flipped classroom addresses the issue that teachers always have insufficient time for in-class activity due to the tight academic schedule. Through the application of flipped classroom, students have to take initiative of previewing the lesson on the online platform, so the lesson time can be saved for more in-depth experiments, group discussion or other activities. Thus, this study will provide the pedagogical insights to school teachers in promoting students' self-directed learning with implementing flipped classroom in schools.

3.3 Research Questions

According to the research purposes, three research questions were proposed for the direction of data collection and result analysis:

- I. In the Hong Kong primary school context, in what ways can the flipped classroom model develop the self-directed learning of students in General Studies classroom?

- II. What are the limitations of implementing a flipped classroom in Hong Kong primary schools?
- III. What are the suggestions for implementing a flipped classroom in Hong Kong primary schools?

4. Method

4.1 Research Design

This research was conducted as a case study on flipped classroom implemented in General Studies lessons at a local primary school. With qualitative research design, the study adopted the in-depth semi-structured interviews to collect data with six teacher participants and one school principal in this case study. Due to the novel coronavirus outbreak, the researcher cancelled the planned interview with ten students. The semi-structured interviews have a specific topic area and a general set of questions, but follow-up questions were raised according to the participants' responses. This method is chosen because the researcher will be allowed 'to enter into the other person's perspective' (Patton, 2002, p. 341).

4.2 Setting

This study was done in a local primary school in Hong Kong, which is a mixed-sex band three primary school located in New Territories. This school recruits numerous new immigrant students every year so as to tackle the problem of under-enrolment. Yet, most of them have low learning motivation due to a multitude of barriers. For instance, their teachers use Cantonese to teach in General Studies lessons, but these immigrant students do not have mastery of the dominant language. As a result, some teachers tried to upload some lecture videos with Chinese subtitle in the school intranet in order to help them overcoming the language barriers, which is also one of

their reasons of implementing flipped classroom model. On the other hand, the teachers in this school are suggested to apply various IT materials in their lessons. According to their school development plan (School Development Plan 2018-2019, 2018), enhancing students' self-directed learning skills by using e-learning strategies is one of their educational philosophies, so the school principal has expressed her approval and welcome for applying flipped classroom model in their school since 2018.

4.3 Sampling Method and Participants

Criterion sampling was used in selecting teacher participants for the interviews due to the limited number of primary data sources and ease of data collection. They had taught the upper primary students in General Studies at the whole class level, because the school only apply flipped teaching from primary four to primary six. Besides, the researcher approached teachers who had the experience of implementing flipped classroom in their lessons, otherwise they may not have the firsthand experience to share during the interview session. Teacher participants were approached using these criteria, and six teachers (four females, two males) agreed to be interviewed. Length of their teaching experience ranged from 2 to 24 years, with an average of 13.2 years (see Table 1).

Table 1. Teacher participants' profile

Teacher	Age	Years of teaching	Subject(s) taught
Adeline	26	2	General Studies, Mathematics, Music
Ben	30-35	8	General Studies, P.E.
Chloe	30-35	9	General Studies, Chinese, Putonghua

Dorothy	40	16	General Studies, Mathematics, ICT
Ethan	40-50	20	General Studies, ICT
Fiona	>50	24	General Studies, English

Note: All names are pseudonyms. Years of teaching experience is based on the time of interviewing.

4.4 Procedures

Before the interview session, informed consent forms were delivered to the participants at the beginning, and it is clearly stated that all the personal data or interview content is anonymous and confidential. The participants were also reminded that all the information only available to the related parties, including the primary supervisor and the principal researcher. Each face to face interview ran around 20 minutes and follow-up phone interview was adopted when it is necessary.

For the present study, semi-structured interviews were employed to discover the effectiveness of flipped classroom to students' self-directed learning in General Studies. Most of the tentative interview guides were open-ended questions, and further questions were asked for clarification. The tentative interview questions were based on the consultation with the researchers' supervisor (see Appendix 1). The medium of instruction of the interviews was Cantonese which is the first language of the participants, so that they might feel more comfortable to express their viewpoints. The interview questions had been sent to the participants through email before the interviews, hence they could get well-prepared to join the session. All interviews were audio recorded and transcribed into English (see Appendix 2).

4.5 Data Analysis

The present study data from the semi-structured interviews were analyzed using grounded theory approach through open coding and thematic analysis, which concerns with ‘the discovery of theory from data systematically collected and analyzed from social research’ (Glaser & Strauss, 1967, p.2). Open coding was done by hand and then input into a spreadsheet for focusing on the conceptualization and categorization of phenomenon via analyzing the data intensively (Strauss & Corbin, 1990). When all the raw data were transcribed and proofread, the transcribed data was coded with labels categorizing into different subjects (Charmaz, 2006, p.43). Lastly, the significant paragraphs or phases from the collected data were gathered and categorized to respond to the research questions. After reviewing the method of the present study, the following section presents the findings in relation to the analysis of the qualitative questions.

5. Findings

5.1 Responses to students’ self-directed learning via flipped classroom

This section addresses RQ. 1 “In the Hong Kong primary school context, in what ways can the flipped classroom model develop the self-directed learning of students in General Studies classroom?”. When asked to think whether flipped classroom approach can develop students’ self-directed learning skills, there was a recurrent pattern of participants talking about flipped classroom can only slightly promote self-directed learning skills. Most of the respondents commonly represented that this model is a teaching approach with a lot of restrictions in operation, which will be discussed in details in section 5.2.

5.1.1 Taking Ownership of Learning

Although the majority of participants considered flipped classroom can only slightly enhance students' self-directed learning skills, four respondents indicated that students' self-directed learning skills will be facilitated via taking ownership of learning under flipped classroom. School principal commented that students will bear a participatory and active role to review the materials before the lessons, in this way they are more responsible for pursuing the knowledge by themselves.

“Students are likely to ‘sit and get’ in traditional classroom... Flipped classroom changes students’ role into an active learner who need to take charge in their learning process if they want to explore new things” – Dorothy

Dorothy described that her students always expect teachers showing them what to learn or where to copy the right answers under usual classroom. On the contrary, flipped teaching style offers them a responsibility to acquire or to create the knowledge actively, rather than getting the answers from the blackboard. She also cited one of her science lessons as an example: the students were required to preview the water filtration system and basic knowledge about water treatment before the class. Then, they were guided to make a water filter for filtrating the dirty water in the lesson. This practice forced students to gather information for selecting the most effective filter media in order to design the best water filter. Thereby, Dorothy agreed that flipped classroom can nurture students' habit of taking ownership of learning, which gradually promotes their awareness of self-directed learning.

5.1.2 Personalized Learning Experience

In addition to taking ownership of learning, Ben is the minority of participants who believed that flipped teaching can provide students a personalized learning experience,

which is an important factor of self-directed learning skills according to his responses.

“I think flipped classroom emphasizes on personalized learning, which allows student’s self-paced learning and solves the problem of ‘one size fits all’.” – Ben

Ben expressed that one of the significant factors of self-directed learning is to control individuals’ learning paces, so this model can provide students more flexibility in their personalized learning because they are allowed to learn on their own pace. He mentioned that flipped teaching is particularly favorable for lower achieving students, because they are enable to review the teaching material as many times as they need through replay, pause and skip buttons in order to adjust their own learning speed. For those higher achieving students who already had a clear understanding of the covered content, flipped classroom provides them a flexible timetable to delve further into the subject. Ben used to upload extra learning materials to those who finished the basic foundation or looking for difficult challenge. Hence, Ben concurred this pattern of learning experience is more personalized to develop students’ self-directed learning skills.

5.2 Responses to the limitations of flipped classroom

This section addresses RQ. 2 “What are the limitations of implementing a flipped classroom in Hong Kong primary schools?”. All respondents have expressed their concerns on such model in operation, their viewpoints and current practices generated some interesting findings in the below, which can be divided into five parts: structural constraints, technological issue, insufficient resources, teachers’ attitude and students’ motivation issue.

5.2.1 Structural Constraints

There are four participants believed that flipped classroom does not help to improve students' academic outcome due to the current education system in Hong Kong.

“Under the exam-oriented education system, this model is ineffective to help students getting higher scores on tests” – Fiona

For instance, an experienced teacher Fiona who has worked for 24 years in education, she thought that flipped classroom model is not applicable to Hong Kong's schooling system. She further explained that the exams are basically structured to assess students' proficiency on recalling the information from task books. Thus, traditional classroom is more effective to help students getting higher marks with practicing rote learning.

“Not all the tasks are suitable and easy to be flipped.” – Adeline

Adeline is a teacher who rarely majored in General Studies at university. She pointed out that many people will misunderstand General Studies is a subject only with the science experiments. However, the curriculum of General Studies also involves social, humanities and technology education, which are not suitable and easy to apply flipped classroom. Adeline cited an example about the chapter of government structure and rule of law. She believed that these kinds of content are difficult to comprehend via previewing the information on the internet.

5.2.2 Technological Issue

As for the question relating to the difficulties that they encountered when trying to implement flipped teaching, five participants have talked about the difficulties relating to technological issue.

“There are three students live in Shenzhen in my class... I could not require them to watch some videos in YouTube before the General Studies lessons, because they are unable to access to YouTube at home... These kinds of situations are very common at our school” – Dorothy

Dorothy expressed that she has three cross-boundary students who needs to cross the boundary from the mainland to Hong Kong each day. Under the country's Internet censorship policy, they cannot access to certain websites like YouTube or Google within the country. Yet, Dorothy stated that General Studies teachers are likely to share the link of YouTube video on school intranet, because it is very convenient to select the suitable educational television (ETV) or the latest news videos on YouTube. Due to the issue of cross-boundary students, their selection of online materials for students' learning was extremely reduced.

“It is unimaginable but it is true, some students do not have their own computer or a stable Internet access at home.” – Ben

“Some of my student will use “internet was down” or “computer broke” as an excuse for not doing homework.” – Ethan

Apart from the issues of cross-boundary students, technology access is another problem in their school. Ben claimed that the wealth disparity in Hong Kong is very serious and over 80% of their students come from low-income family background. Some students are not able to gain access to view course content as they do not have a dependable data connection or they use second-hand digital device, which requires maintenance all the time. Besides, like other teachers, Ethan worried that some students may use the technological issues as an excuse for not doing the online homework. It is troublesome for teachers to decide whether to punish them or trust

them.

5.2.3 Significant Investment

Half of the participants concerns about the significant investment to develop flipped teaching. During the interview, it is discovered that the school principal mainly considered the time investment and capital, while the teachers were likely to discuss the extra workload in flipped teaching.

“It takes times, money and human resources to flip the class.”

–School principal

The school principal pointed out that it required more time investment for changing the lecture-based classroom pattern into flipped classroom, especially for their first flipped course. In order to introduce this new pedagogical model to her colleague, she needed to spend time on doing the researches of flipped classroom and had school affairs meetings with them. She also mentioned their school had to invest much capital on purchasing the e-learning software and digital devices, like laptops and tablets. In addition to times and capital, principal added that they may not have enough human resource to develop this approach, because the adoption of flipped classroom may become a heavy pressure to the teachers.

“Preparing a flipped classroom is an extra workload to each teacher.”

– Ethan

“I already have hundreds of things to do... should I still spend time to flip my class?”

Maybe supportive policies from EDB are a way to change.” – Chloe

Ethan asserted that there was numerous preliminary works to ‘flip’ a class, so the implementation of flipped classroom will be an extra workload and responsibility to

them. He further illustrated his extra workload of implementing a flipped classroom, including prepare a PowerPoint or search for an appropriate video that will be posted online; grade the assigned sample quizzes as well as respond to students' questions on the online forum; then eventually conduct an in-class activity related to the online materials. At the same time, Chloe made the above comment and claimed that teachers are more willing to change their existing teaching pattern if the Education Bureau makes some supportive policies to reduce their workload.

5.2.4 Teachers' Attitude

Apart from the issue of significant investment, five respondents have mentioned teachers' personal attitude is one of the barriers of applying flipped teaching.

“Change will present unknowns, so most of the teachers are unwilling to get out of the comfort zone.” – Dorothy

“Honestly, I am not good at using ICT stuff...I feel anxious to adopt the new technology in teaching, especially flipped classroom” – Chloe

For example, Dorothy thought that the majority of teachers familiar with traditional teaching so they were confused with changing their usual teaching pattern into flipped classroom unexpectedly. Meanwhile, some respondents worried about their technology skills when engaging in flipped teaching. Chloe indicated she is not well-skilled in using computer and technology stuff, so she gets used to rely on the IT assistants who can handle every technical problem in her daily teaching. She also commented that it will take a long time for the senior teachers to learn the new ICT stuff, but most of them may not willing to spend their time due to their heavy workload.

5.2.5 Students' Motivation Issue

There are four respondents generally mentioned that self-directed learning relies heavily on the learning motivation of students, because they have to be self-motivated for preparing the class without being closely monitored by the teachers.

“Some students are not as motivated as others, so there is no guarantee that whether they will cooperate with this new model.” – Ethan

“This approach requires trust between learners and teachers.” – Fiona

Ethan pointed out that not all the students are responsible and autonomous in learning, so no one can guarantee whether they will follow teacher's instructions. He noted that teacher needs to reteach the online materials when the class has one uncooperative student. Hence, lack of motivation is a serious issue influencing the effectiveness of flipped teaching. Furthermore, Fiona made the above comment and added that the group activities and class interaction will become useless when students are not motivated to preview the basic knowledge. As a result, a flipped classroom will be able to function smoothly only if the learners are motivated to watch the pre-teaching videos, involve in the online forum or complete the assigned work at home.

6. Discussions

6.1 Relationship between Flipped Classroom & Self-directed Learning

6.1.1 Contrary to Previous Studies

Some reviewed studies in the past have suggested that the flipped classroom model can significantly promote a positive effect on students' self-directed learning skills (Zheng & Wen, 2016; Genc, Genc & Tatoglu, 2017; Zainuddin & Perera, 2018). For instance, according to Zainuddin and Perera (2018), students in their study tend to become more autonomous and empowered to take charge of their learning, they

reported that accessing the online courses' materials before attending classes became students' daily learning habit. In contrast to this view, this sample of Hong Kong primary teachers had different viewpoints with the past literature. They thought that flipped classroom can only slightly enhance self-directed learning skills to certain students, this could be due to students' learning motivation, teachers' personal beliefs and conceptualization about flipped classroom model. More importantly, it is speculated that teachers' awareness on flipped classroom and self-directed learning skills may not sufficient. When asked to think whether this approach can develop students' self-directed learning skills, most of them only mentioned students' responsibility or self-discipline in a few sentences, and then moved on to talk about the issues or limitations of applying flipped classroom.

6.1.2 Students' Motivation & Teachers' Beliefs affect the Effectiveness of Flipped Classroom

Besides, the present study discovered that the students' motivation and teachers' personal beliefs are the significant reasons affecting the effectiveness of flipped classroom, which support the past studies. Previous research reveals that intrinsic motivation is considered as a critical element of self-directed learning (Loyens, Magda, & Rikers, 2008), which can initiate and maintain learners' efforts (Corno, 1992; Garrison, 1997). Many teacher participants in this study expressed that lack of learning motivation is the main reason affecting the positive effect on students' self-directed learning because they were not motivated to preview the course content for getting a basic understanding of the lesson. Although the previous literature has suggested setting two computers at the back of the classroom so that the students are allowed to watch the videos in class (Bergmann & Sams, 2012), this practice will violate the fundamental principle of flipped classroom. Meanwhile, not all

information is covered during the lessons, so the learners will bear more responsibility to complete the assigned work before class without being monitored. Some unmotivated students without clear focus will be distracted easily in this situation. This model will not be unsuccessful if teachers need to spend additional time discussing the online lectures to the students who did not prepare at home (Beach, 2014). Hence, the risk of low motivation and poor preparation of students bring about the challenges of flipped teaching.

Apart from students' learning motivation, teachers' personal beliefs and conceptualization are also the reasons affecting the effectiveness of flipped classroom to students' self-directed learning in this study. Relevant researches reveal that teachers' pedagogical beliefs of applying instructional technology will determine their use of new pedagogical innovations (Ajjan & Hartshorne, 2013; Ertmer, 2005; Hermans et al., 2008). The teachers interviewed in this study did not implement the flipped classroom model voluntarily, they were required to employ this new model so as to apply the Quality Education Fund. Teachers' perspective on flipped teaching may highly influence their practice of instruction (Long, Cummins, & Waugh, 2016), this part will be studied in details in the section 6.2.2 of "Second-order Barriers: Internal Limitation".

6.1.3 Teachers' Supportive Views of Flipped Classroom

Although this sample of teachers thought that flipped teaching can only slightly enhance learners' self-directed learning, they generally held a supportive view that such model can nurture students' habit of taking the ownership of learning. Referring to the interviewed teachers, students were granted space to take the initiative of gathering additional information if they have questions about the online learning

materials. This shows that it promotes students taking ownership to acquire knowledge actively, instead of receiving the information from textbook or instructors passively (Romiszowski, 1996). Wang (2017) adds that flipped teaching is a pedagogical process which learners are allowed to get access to content and follow their own pace to learn (Bishop & Verleger, 2013). For instance, some students are visual or auditory learners, while some students prefer written texts. As a result, the design of flipped classroom enhances students' awareness on taking charge of their learning as well as transforming their role to active learners, which progressively promotes their self-directed learning skills. After discussing the relationship between flipped classroom model and students' self-directed learning, the following part will analyze the limitations of adopting such model related to first-order and second-order barriers.

6.2 Limitations of Implementing Flipped Classroom

6.2.1 First-order Barriers: External Limitations

I. Policy: Large Time & Effort Investment

This study supports the previous literature that first-order and second-order barriers will emerge when implemented flipped classroom (Ertmer, 1999). First-order barriers mean the logistical resistances that are extrinsic to the instructors, while second-order barriers are intrinsic to the instructors (Sherman & Howard, 2012). In this case study, one of the external limitations is that there are no supportive policies to support the large time and effort investment in adopting flipped teaching. According to the findings in this study, it involves significant investment to implement flipped classroom. The demand for instructor' energy and time in the existing workload without relating technology is already enormous (Tsang, 2018; Wang, 2017), so advisable policies can drive school development and transform (Freitas & Oliver,

2005). This shows that without supportive policies to balance teachers' heavy workload, they will have unwillingness to apply flipped teaching. For example, providing training courses or professional consultative personnel to guide and assist teachers for preparing the lesson materials, would help to address the issues.

II. Resources: Issue of Technological Accessibility

Apart from the significant investment, another first-order barrier of developing flipped classroom is the technical issue. Since this school is facing the issue of under-enrolment, it recruits a lot of cross-boundary students in admission. According to the respondents, at least 10% of the students in their school are cross-boundary students. Those learners are not able to access to certain e-learning platforms when they go back to mainland, such as YouTube or Google Classroom, so this phenomenon brought about the difficulty to develop flipped teaching. Besides, since this school is located in public housing estate, the majority of their students come from grassroots family. A few students do not have a dependable network connection or they use second-hand computer, which is often required maintenance. Thereby, they are difficult to preview the course content outside the classroom due to their socioeconomic status (Wang, 2017). In order to address this issue, teachers will print some key points from the lecture video for them to preview, but it only solves a problem without stamp out its root cause.

6.2.2 Second-order Barriers: Internal Limitations

I. Teachers' Pedagogical Beliefs

In addition to the first-order barriers, the internal limitations can be classified into the issues connected to teachers' beliefs and self-confidence with flipped teaching, which greatly influenced their practice in this study. From the perspective of teachers'

pedagogical beliefs, most of the respondents had an affirmative opinion that traditional teaching paradigm is more effective than flipped classroom model in the Hong Kong context, especially when the assessment method is to measure students' proficiency on specific subjects through a standardized test. Since the content of standardized tests is usually based on the standard lecture in conventional teaching, so teachers prefer to practice students' memorization in the lecture-based classroom (Su, 1996). Furthermore, conventional teaching paradigm seems to be appealing to these teachers, because they already get used to this teaching approach and they clearly realize how to carry out a successful lesson under traditional classroom. In this way, the adoption of flipped teaching will break out their comfort zone and bring about many unknowns (Gopalan et al., 2018). Therefore, teachers preserved a negative attitude and beliefs on this model which led to their resistance and conservative of being to change.

II. Lack of Confidence

On the other hand, this study supports the previous finding that lack of confidence is another second-order barrier that will prevent teachers from implementing the flipped classroom. Since flipped teaching relies heavily on technologic skills, teachers always stay cautious over the change if they are not well-skilled in using information technology (Hord et al., 2006). They will feel anxious due to being afraid of failure in front of the children who probably know more about the technologies (Wang, 2017), thus teachers are not confident to use the new approach instantly. Meanwhile, even though some teachers are good at technological skills, they still reserve their confidence on adopting flipped teaching due to pedagogical reasons. To cite the respondents Ethan as an example, he studied Computer Science at university so he is well-skilled on using ICTs in his teaching. However, flipped teaching relied heavily

on students' self-motivation and primary students are not self-disciplined compared with the adult learners (Wang, 2017; Young, 2017), so Ethan admitted that he lacked of confidence to create the engaging online materials in order to encourage students' learning under flipped classroom model.

7. Suggestion

After reviewing the limitations and concerns of interviewed teachers on applying flipped teaching, this section presents five suggestions for creating an effective flipped classroom in the Hong Kong school context.

7.1 For the Faculty Challenges

I. Cultivating Community of Practice with Professional Development

Teachers may not accustom to flipped teaching approach or they may not completely understand the value of this new method of instruction at the initial stage. Grypp and Luebeck (2015) assert that instructors should embrace the intrinsic value of the new approach first and explore its new usage in class afterwards. For example, teachers should understand that flipped classroom can achieve higher academic outcomes of students when it is used in a right way (Alten et al., 2019). Therefore, when school teachers realize the worth and merits of flipped classroom, they are more likely to connect it with their daily teaching practice (Wang, 2017). Strengthening the professional development culture and teacher training of flipped teaching can deepen their understanding of this paradigm, such as cultivating community of practice (Wenger, 1998; Wenger, McDermott, & Snyder 2002). For instance, the schools can irregularly organize some workshops for professionals or experienced teachers to share their experiences on flipped teaching practices and to give advises to their colleagues (Mazur et al., 2015), so such programmes will gradually develop the

community of practice which provide teachers an opportunity to exchange information, knowledge and skills.

II. Establishing Peer Mentorship Programs

Apart from strengthening the professional development, peer mentorship programs can also be established to pair up the less motivated teachers about the flipped classroom with the leading teachers in the programs, so that teachers can reflect on their teaching practices with the mentors in a supportive environment, and it can also reduce their sense of insecurity or isolation of implementing the new teaching practices (Wang, 2017). Teachers are encouraged to take part in reflective dialogue regarding their present practices all the time as well as draw up an action plan to shape their future development (Downey et al., 2009). Furthermore, recognition reinforcement can be used to praise the outstanding teachers or peer-mentoring groups who make good use of flipped classroom model in their teaching, such as certificates of appreciation. More importantly, these peer mentorship programs or professional development events need to be a long durational process of progression so as to address the faculty challenges effectively.

7.2 For the Students' Motivation Challenges

III. Applying the Approach of Gamification

The findings in this study reveal that learning motivation is a significant factor influencing the effect on students' self-directed learning with flipped classroom model. To engage students learning, some educationists and scholars recently tried to integrate gamification with flipped teaching, it is found that the method of gamification supported flipped classroom can heighten students' intrinsic motivation on goal accomplishment (Matsumoto, 2016; Ozer, Kanbul, & Ozdamli, 2018). Hence,

teachers may consider employing flipped classroom with gamification elements, such as leaderboard, points and insignia. For example, points and badge will be awarded to the students who participant more in the online discussion forum. Under a gamified environment, it can create a positive effect on student engagement and motivation towards flipped learning (Lo & Hew, 2017).

IV. Applying the Cognitive Theory of Multimedia Learning

In addition to the approach of gamification, Mayer's (2014) cognitive theory of multimedia learning can be used to guide video production for engaging students learning. Concerning the duration of instructional videos, some learners are disengaged if watching long lecture videos (Schultz et al., 2014), so a whole chapter of long presentation can be separated into different short videos. According to Guo et al (2014), students can concentrate on watching a lecture video at around 6 minutes generally. Therefore, teachers are suggested to provide the videos within 6 minutes. Besides, Mayer (2014) proposes a signaling principle which means that students will learn better if significant information is highlighted. For example, teachers may apply screencasts or PowerPoints presentations to instruct students' note-taking and video watching progressively (Snyder et al., 2014).

7.3 For the Technological Issues

V. Supporting Students with Limited Technology Accessibility

In this study, many learners have encountered the difficulties of Internet accessibility to preview the pre-class materials at home. These students with underprivileged background may lose the opportunities of learning in flipped teaching approach (Wang, 2016). Considering the students with less family support, schools should expend the use of technological facilities at school so as to make ICT supports

available for them (Schultz et al., 2014). Moreover, the Education Bureau has provided different resources and supports, such as the “Composite IT Grant” or “Support Scheme for e-Learning in Schools”, so the school can apply these funding to acquire mobile computing devices for their students. On the other hand, considering the issues of cross-boundary students, they are unable to access to certain e-learning platforms due to the Internet censorship policy in China. As a result, teachers can additionally prepare some copies of the flipped lessons materials in DVDs or flash drives (Schultz et al., 2014), so the cross-boundary students can still preview the learning materials when they go back to mainland.

8. Limitations of the Study

This exploratory study is limited by the small sample size and the selection of participants. Due to the novel coronavirus outbreak, all primary schools would resume classes on mid-June. Hence, the researcher can only cancel the planned interview with ten students in the school. The findings of the study could be affected by only having teachers’ perspective. Since this study is considered as an exploratory, small-scale study, it will restrict the extent to which the research outcomes can be generalized. Further studies can include other sample of interview, such as students and parents, would help to examine the development of students’ self-directed learning with flipped teaching approach.

On the other hand, the study only adopted the semi-structured interview to collect data due to time constraints, which may bring about the problem of collecting subjective data that based on respondents’ personal values and practices. Further researches can apply lesson observations as a data collection technique to verify teachers’ reported responses on implementing flipped classroom in their daily teaching.

9. Conclusion

In conclusion, this study mainly investigated the effectiveness of flipped classroom to students' self-directed learning; and the limitations and suggestions for implementing flipped classroom in the Hong Kong school context. This sample of primary school teachers thought that flipped classroom approach can only slightly enhance students' self-directed learning skills due to students' low motivation and teachers' personal beliefs. Meanwhile, it is discovered that they have encountered the first and second-order barriers when adopting flipped teaching. The former related to the external limitations, such as no supportive policies to support the large time and effort investment, while the latter involved the internal limitations including teachers' pedagogical beliefs and self-confidence. In order to mitigate these problems, this study proposes five suggestions, including cultivating community of practice with professional development, applying the Cognitive Theory of Multimedia Learning and gamification, establishing peer mentorship programs, and supporting students with limited technology accessibility. Let me use a renowned quote to end this study, "give a man a fish, and you feed him for a day. Teach a man to fish, and you feed him for a lifetime". At the dawn of the Information Age in the 21st century, it is important to encourage learners engaging in their learning actively instead of acquiring knowledge from school teachers passively.

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Appendix 1: Interview Questions

1. What is flipped classroom?
2. Have you ever applied the flipped classroom approach in your lesson? If yes, can you mention them out briefly?
3. From your point of view, what is self-directed learning?
4. Do you think whether flipped classroom approach can develop students' self-directed learning skill? Why or why not?
5. From your point of view, what are the important factors of an ideal flipped classroom for enhancing students' self-directed learning?
6. What are the difficulties you encountered with flipped classroom approach? Please explain more about it.
7. Do you have any suggestions about the above difficulties? Please explain more about it.

Thank you for taking the time to do this interview!

Appendix 2: Interview Transcripts**Interviewee: Adeline**

1. Q: What is flipped classroom?

A: Flipped classroom is a new teaching model. It means a blended learning with the face-to-face lecture at school and individual study at home. There are different methods to start a flipped classroom.

2. Q: Have you ever applied the flipped classroom approach in your lesson? If yes, can you mention them out briefly?

A: Yes, seldom. Our principal encourages teacher to apply this approach in the lesson. I usually use this approach in science lesson. Honestly, not all the tasks are suitable and easy to be flipped. Many people will misunderstand General Studies is a subject only with the science experiments. However, it also involves social, humanities and technology education. Just like the chapter of government structure and rule of law, these kinds of content are difficult to comprehend via previewing the information on the internet. That's why I seldom applied the flipped classroom approach in my lesson.

3. Q: From your point of view, what is self-directed learning?

A: I think self-directed learning means the students can make decisions for themselves, and they are responsible for these decisions. Just like flipped classroom approach, students will need to bear the result of not previewing the lessons. Also, one of the main factors contributing to the development of students' self-directed learning through a flipped classroom is the nature of the teaching activities, because what a flipped classroom emphasizes is the participation of students.

4. Q: Do you think whether flipped classroom approach can develop students' self-directed learning skill? Why or why not?

	<p>A: Can I say to a small extent it develops students' self-directed learning skill? I think this approach relies heavily on the learning motivation of students. Some students may not watch the video at home that means they did not have any prior knowledge. How come they will do the self-directed learning? Therefore, the effectiveness of flipped classroom still depends on whether the students are self-motivated.</p>
5.	<p>Q: From your point of view, what are the important factors of an ideal flipped classroom for enhancing students' self-directed learning?</p> <p>A: There are many factors affecting the success of flipped classroom. If you talk about self-directed learning, I think students are still the most important factor. If they don't want to self-learn on anything, no one can force them to learn. Another factor comes from students' parents. Many parents do not have a clean understanding of flipped classroom. When the school implements a new policy without parents' support, the relationship between school and parents will be worse and it will also affect the effectiveness of flipped classroom.</p>
6.	<p>Q: What are the difficulties you encountered with flipped classroom approach? Please explain more about it.</p> <p>A: Just like what I have mentioned, lack of motivation is one of the difficulties. Besides, from the teachers' perspective, it took us long time to adapt this new teaching model. No one is willing to get out of the comfort zone.</p>
7.	<p>Q: Do you have any suggestions about the above difficulties? Please explain more about it.</p> <p>A: Award scheme is a good method to motivate students preview the materials. If they have watched the videos or they have answered my questions in the online forum, points and gifts will be given to them.</p>

Interviewee: Ben

1. Q: What is flipped classroom?

A: I think flipped classroom is not a teaching approach only. It is also a pedagogical idea that the location of the lesson is not restricted. Students have the choice to choose the most suitable learning way for them.

2. Q: Have you ever applied the flipped classroom approach in your lesson? If yes, can you mention them out briefly?

A: Yes, I have. Our school principal encouraged teachers to apply e-learning in our teaching and learning. I usually simplified the process of flipped classroom approach. For example, I shared some interesting videos which are related to the subject, so these practices can raise students' interest. Or I used to upload extra learning materials for the higher-achieving students so that they can learn more extra things outside the lessons.

3. Q: From your point of view, what is self-directed learning?

A: Self-directed learning is a complicated concept which includes many requirements. From my point of view, one of the significant factors of self-directed learning is to control individuals' learning paces. Just like the flipped classroom, it can provide students more flexibility in the learning because they are allowed to learn on their own pace. I think this is a practice of self-directed learning.

4. Q: Do you think whether flipped classroom approach can develop students' self-directed learning skill? Why or why not?

A: Slightly yes. I think flipped classroom emphasizes on personalized learning, which allows student's self-paced learning and solves the problem of 'one size fits all'. Flipped teaching is particularly favorable for lower achieving students, because

	<p>they can review the teaching material as many times as they need in order to adjust their own learning speed. Also, for other students who already had a clear understanding of the covered content. I used to upload extra learning materials to those who finished the basic foundation or looking for difficult challenge, so this pattern of learning experience provides them a flexible timetable to delve further into the subject, as well as transfers the learning responsibility to students. They should be responsible to preview the materials before the lessons.</p>
5.	<p>Q: From your point of view, what are the important factors of an ideal flipped classroom for enhancing students' self-directed learning?</p> <p>A: Students' motivation is the most significant factor. Some of them may not watch the video and I did not know who has watched the video or who did not. It is time-consuming for me to trace the record. Also, if a teacher still adopts the direct instruction in the flipped classrooms, they will make the flipped classroom become meaningless. The teaching approach in that way is almost the same as a traditional classroom.</p>
6.	<p>Q: What are the difficulties you encountered with flipped classroom approach? Please explain more about it.</p> <p>A: Everyone knows that the wealth disparity in Hong Kong is very serious. Over 80% of our students come from low-income family background. It is unimaginable but it is true, some students do not have their own computer or a stable Internet access at home. Hence, they cannot gain access to view course content as they do not have a dependable Wifi connection. Also, some of them are using second-hand digital device, which requires maintenance all the time.</p>
7.	<p>Q: Do you have any suggestions about the above difficulties? Please explain more about it.</p>

	A: Considering the technological issue, our school has applied the grants from EDB to purchase some tablets. Students are allowed to borrow them during the recess time or after school, so they can finish the assigned works and review the pre-teaching materials by using schools' devices.
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Interviewee: Chloe

1.	Q: What is flipped classroom?
	A: In flipped classroom, students are able to watch the pre-recorded videos, which are made by teachers or teaching assistants. Then, students can go to school with little background knowledge.
2.	Q: Have you ever applied the flipped classroom approach in your lesson? If yes, can you mention them out briefly?
	A: To be honest, I rarely applied this approach, because it brings about heavy workload to us.
3.	Q: From your point of view, what is self-directed learning?
	A: Self-directed learning means students have the control over their learning process. At the same time, teachers will act as the facilitator to monitor the learning progress of the students.
4.	Q: Do you think whether flipped classroom approach can develop students' self-directed learning skill? Why or why not?
	A: It is hard. Nowadays, these millennial students are very mature. They are eager to gain more freedom in the learning process. Thus, they can bear more responsibility using different technological tools in the flipped classroom. Of course, it still has many issues. For example, it may not improve students' academic outcome due to the exam-oriented education system in Hong Kong.

5.	Q: From your point of view, what are the important factors of an ideal flipped classroom for enhancing students' self-directed learning?
	A: I think the learning atmosphere should be the most important factor. If most of the students in the class are willing to complete the assigned tasks at home, then other students will also follow their peers to do so.
6.	Q: What are the difficulties you encountered with flipped classroom approach? Please explain more about it.
	A: Workload. I already have hundreds of things to do, like the paperwork, grading assignments or having school affairs meetings. Should I still spend time to flip my class? On the other hand, I am not good at using ICT stuff honestly. In my daily teaching, I already get used to rely on the IT assistants who can handle every technical problem. Therefore, I feel anxious to adopt the new technology in teaching, especially flipped classroom, it will take a long time for the senior teachers to learn the new ICT stuff, but most of them may not willing to spend their time due to the heavy workload.
7.	Q: Do you have any suggestions about the above difficulties? Please explain more about it.
	A: For the workload issue, I think supportive policies from EDB maybe a way to improve our heavy workload. The only way to change teachers' existing teaching pattern is that Education Bureau makes some supportive policies to reduce our workload.

Interviewee: Dorothy

1.	Q: What is flipped classroom?
	A: The classes are flipped, that means the teachers took the video in the office first.

	<p>Then, we will send the video link to the whole class before attending the lessons. Students are required to watch the video and then answer a few questions for their pre-learning. When they are having the lessons, the teachers will teach some concepts based on the video.</p>
2.	<p>Q: Have you ever applied the flipped classroom approach in your lesson? If yes, can you mention them out briefly?</p> <p>A: Yes, I used this approach when there was a science experiment in the lessons. Before the science experiment, I will ask my students to understand the purposes or the procedure in the pre-teaching materials, so that I can save the lesson time on the experiment and the reflection.</p>
3.	<p>Q: From your point of view, what is self-directed learning?</p> <p>A: Self-directed learning means students will acquire the knowledge without forced by the adults, such as their parents and tutors. Students are likely to 'sit and get' in traditional classroom. In the usual classroom in the past, my students have a tendency to ask for teachers showing them what to learn or where to copy the right answers from the task book. However, I think flipped classroom changes students' role into an active learner who need to take charge in their learning process if they want to explore new things. As a result, it provides them a responsibility to learn or to create the knowledge actively, rather than copying the answers from the blackboard or books. This is a practice of self-directed learning.</p>
4.	<p>Q: Do you think whether flipped classroom approach can develop students' self-directed learning skill? Why or why not?</p> <p>A: Regarding to the previous question, I can cite one of my science lessons as an example. You know that there is a chapter about water filtration system in General Studies, so I asked my students to preview the water filtration system and basic</p>

	<p>knowledge about water treatment before the class. Then, they were guided to make a water filter for filtrating the dirty water in the lesson. This practice forced students to gather information for selecting the most effective filter media in order to design the best water filter. Therefore, these kinds of flipped classes can nurture students' habit of taking their ownership in learning process and promotes their awareness of self-directed learning.</p>
5.	<p>Q: From your point of view, what are the important factors of an ideal flipped classroom for enhancing students' self-directed learning?</p> <p>A: Teacher is actually an important factor in flipped classroom model. The majority of teachers undoubtedly familiar with traditional teaching so they were confused with changing their usual teaching pattern. Change will present unknowns, so most of the teachers are unwilling to get out of their comfort zone.</p>
6.	<p>Q: What are the difficulties you encountered with flipped classroom approach? Please explain more about it.</p> <p>A: There are three students live in Shenzhen in my class, they needs to cross the boundary from the mainland to Hong Kong each day. They cannot access to certain websites like YouTube and Google so I can require them to watch some videos in YouTube before the General Studies lessons. These kinds of situations are very common at our school. However, we always share the link of YouTube video on school intranet, because it is convenient to select the suitable ETV or the latest news videos on YouTube. Due to this issue, our selection of online materials for students' learning was reduced.</p>
7.	<p>Q: Do you have any suggestions about the above difficulties? Please explain more about it.</p> <p>A: The issue of cross boundary students is hard to be solved. Yet, we tend to print</p>

some key points from the lecture video for them to preview. Also, as I know, some teachers will download the videos into an usb, so that the cross boundary students still can watch it in mainland.

Interviewee: Ethan

1. Q: What is flipped classroom?

A: I think flipped classroom is the opposite with the traditional classroom, that's why it is named "flipped". For example, the independent works like the assignment that will be conducted under teachers' instruction.

2. Q: Have you ever applied the flipped classroom approach in your lesson? If yes, can you mention them out briefly?

A: Yes, I have. To start a flipped course, I have to prepare a PowerPoint or search for an appropriate video that will be posted online; grade the assigned sample quizzes as well as respond to students' questions on the online forum; then eventually conduct an in-class activity related to the online materials. Thus, preparing a flipped classroom is an extra workload to each teacher, because there was numerous preliminary works.

3. Q: From your point of view, what is self-directed learning?

A: I think self-directed learning is a life learning skills in this 21st century. It means students take the initiative to learn with their own methods, like searching the Internet or reading books. Their learning process should not arranged by others.

4. Q: Do you think whether flipped classroom approach can develop students' self-directed learning skill? Why or why not?

A: Yes, a little bit, because the teaching content is still determined by the teachers. Students are just following the teachers' instruction to complete the tasks. More

	importantly, most of the students are not self-discipline on their learning.
5.	<p>Q: From your point of view, what are the important factors of an ideal flipped classroom for enhancing students' self-directed learning?</p> <p>A: I think students' self-discipline is important. For example, some of my student will use "internet was down" or "computer broke" as an excuse for not doing homework. As a teacher, it is troublesome for teachers to decide whether to punish them or trust them. If the students are not self-discipline, it is hard to apply this model effectively.</p>
6.	<p>Q: What are the difficulties you encountered with flipped classroom approach? Please explain more about it.</p> <p>A: In addition to the extra workload, lack of motivation is a serious issue influencing the effectiveness of flipped teaching. Not all the students are responsible and autonomous in learning. Some students are not as motivated as others, so there is no guarantee that whether they will cooperate with this new model. When the class has one uncooperative student, I still need to reteach the online materials.</p>
7.	<p>Q: Do you have any suggestions about the above difficulties? Please explain more about it.</p> <p>A: In order to encourage our students to watch the videos, I think we should not talk too much in the pre-recorded videos. Also, they should not set a very concrete topic in the videos so that students can have their self-exploration on that topic first. Afterwards, they can share what they have found with their peers.</p>

Interviewee: Fiona

1.	Q: What is flipped classroom?
	A: Flipped classroom is a more interactive teaching approach. For example, students

	can exchange their ideas or have discussions on the online platforms. On the other hand, teachers can save time to teach the basic knowledge through uploading some useful information on school Intranet.
2.	<p>Q: Have you ever applied the flipped classroom approach in your lesson? If yes, can you mention them out briefly?</p> <p>A: Of course. Most of the General Studies teachers have applied this approach in our school. We tend to upload some related video or PowerPoints in the school Intranet and then arrange them (students) to preview it or discuss in the online forum. Lastly, we will have some class activities during the lesson. Yet, the exams in Hong Kong are basically structured to assess students' proficiency on recalling the information from task books. Under the exam-oriented education system, this model is ineffective to help students getting higher scores on tests. Thus, I prefer teaching student in traditional classroom, which is more effective to help students getting higher marks with practicing rote learning.</p>
3.	<p>Q: From your point of view, what is self-directed learning?</p> <p>A: Self-directed learning is a good habit for students. I believe self-directed learners are responsible for the learning and management in the whole learning process. When they encounter any problems in learning, they will find out the answer by themselves instead of asking teachers for help.</p>
4.	<p>Q: Do you think whether flipped classroom approach can develop students' self-directed learning skill? Why or why not?</p> <p>A: A little bit, but I wouldn't say yes or no. It actually depends on different factors, like the students' ability, students' interest and students' demands.</p>
5.	Q: From your point of view, what are the important factors of an ideal flipped classroom for enhancing students' self-directed learning?

	A: Internet is an important factor undoubtedly. Although our school is not located in Tin Shui Wai or Sheung Shui these kinds of places, we still have some cross-boundary students. They are difficult to adapt to the flipped course because they even cannot watch the YouTube video.
6.	Q: What are the difficulties you encountered with flipped classroom approach? Please explain more about it.
	A: This approach requires trust between learners and teachers. For example, you can imagine that the group activities and class interaction will become useless when students are not motivated to preview the basic knowledge. Flipped classroom can function smoothly only if the learners are motivated to complete their work at home, like the pre-teaching videos, online forum or assigned homework. Another difficulty I encountered is the technological issue that I need to apply the latest technologies in teaching. Sometimes, it is difficult to select the suitable videos so I have to take the video by myself. It is not an easy task for me.
7.	Q: Do you have any suggestions about the above difficulties? Please explain more about it.
	A: Since some teachers are not good at using digital devices, our school arranged some ICT training and workshops for us. These professional development events taught us how to take a video, how to edit the video and how to share the link with students, so it is quite practical to the senior teachers, like me.

Interviewee: School principal

1.	Q: What is flipped classroom?
	A: Flipped classroom is a new teaching approach which is introduced in recent years. It focuses on student participation in their learning progress, so many people

	define it as a learner-centred teaching method. With this approach, students will acquire the background knowledge outside the class as well as conduct some higher-order thinking activities in class.
2.	<p>Q: From your point of view, what is self-directed learning?</p> <p>A: Self-directed learning emphasizes on students' responsibility, which is about someone can apply appropriate learning strategies according to his/her learning needs. Also, the self-directed learners always evaluate their learning outcomes in order to manage their learning progress.</p>
3.	<p>Q: Do you think whether flipped classroom approach can develop students' self-directed learning skill? Why or why not?</p> <p>A: To a certain extent, flipped classroom can develop students' self-directed learning skill, because students need to review the materials before the lessons. In this way, they will bear a participatory and active role, or they will become more responsible for pursuing the knowledge by themselves. However, many issues should be addressed before that.</p>
4.	<p>Q: From your point of view, what are the important factors of an ideal flipped classroom for enhancing students' self-directed learning?</p> <p>A: There are many important factors affecting an ideal flipped classroom. I think teachers' professionalism is one of the factors. Since the implementation of flipped classrooms requires teachers to spend much time and energy to prepare the courses, teachers' teaching pressure will be increased in this situation. Therefore, our school needs to form some teacher professional groups in order to provide peer support for them.</p>
5.	<p>Q: What are the difficulties you encountered with flipped classroom approach? Please explain more about it.</p>

	<p>A: I will say this approach involves significant investment. It takes times, money and human resources to flip the class. In the beginning, I needed to spend a lot of time on doing the researches of flipped classroom and having numerous meetings with my colleague, because I have to introduce this new pedagogical model to them. Also, it is difficult to arrange the human resource to develop this approach, because many teachers already have heavy pressure and school workload. Apart from the times and human resources, money is another problem. Our school had to invest much capital on purchasing the e-learning software and digital devices, like laptops and tablets.</p>
6.	<p>Q: Do you have any suggestions about the above difficulties? Please explain more about it.</p> <p>A: The majority of our students come from the nearby public housing estate, so their disadvantaged background will become a burden in flipped teaching model. That's why I need to purchase more digital devices so that they can preview the information at school.</p>