A Project entitled

**Application of Flipped Classroom for
Self-Directed Learning in
Hong Kong Secondary Schools:
The Combination of Technology and
Self-Motivation in
Out-of-School Learning**

Submitted by

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Declaration

I, *Wong Miu Fung*, declare that this research this research report represents my own work under

the supervision of Dr. *Cheng Kwok Shing*, and that it has not been submitted previously for

examination to any tertiary institution.

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Abstract

This research involves an experimental study of Flipped Classroom application in a Hong Kong secondary school from a student teacher perspective. The study investigated the views of students on introducing Flipped Classroom for their Self-Directed Learning in information technology subjects, Computer Literacy (CL) for junior secondary students, Information and Communication Technology (ICT) for senior secondary students. It also examined the motivational effects of Flipped Classroom towards the Self-Directed Learning of students. This mixed methods research included questionnaire results completed by 97 students and semi-structured interview results from 11 students. In addition to literature review of Flipped Classroom and Self-Directed Learning, the design of questionnaire and interview were theoretically supported by Technology Acceptance Model (TAM) and Self-regulated Learning (SRL). Matching the mixed methods research results with the firsthand experience and observation of Flipped Classroom as a student teacher, Strengths, Weaknesses, Opportunities, Threats (SWOT) of Flipped Classroom were further explored despite the proved positive views of students and motivational effects of Flipped Classroom towards Self-Directed Learning. Suggestions were also included in this paper for future application of Flipped Classroom for combining technology with self-motivation of students especially their out-of-school learning.

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Research Objectives

This research aims to investigate and explore the motivational effects of Flipped Classroom towards students' Self-Directed Learning. The investigation and exploration are expected to be theocratically supported and experimentally applied. Systematic and scientific measurements are designed to evaluate the effectiveness of Flipped Classroom for enhancing the Self-Directed Learning willingness and ability of students.

Since secondary students are selected as the target group, this research also expected to be different from the previous researches of Flipped Classroom in Hong Kong which mainly focused on universities and post-secondary institutes, for example, the 'iClass' system created by The University of Hong Kong was reviewed as one of the successful Flipped Classroom models in Asia with concrete examples of how the medical classroom was flipped (Chua & Lateef, 2014; Wong & Chu, 2014; Sharma, Lau, Doherty & Harbutt, 2015).

In addition to higher education, the theoretical benefits of Flipped Classroom seem to be applicable to primary and secondary education, with the aid of technology both pre-class and in-class learning activities can be more diversified because of the Flipped Classroom pedagogy (Wong & Cheung, 2015).

Bridging the previous research gap between Flipped Classroom and Out-of-school Self-Directed Learning, this research aims to contribute with higher research value.

Research Questions

1. What are the views of students on introducing Flipped Classroom in secondary school?

2. What is the impact of Flipped Classroom on the motivational effects of students' Self-Directed Learning?

3. What are the Strengths, Weaknesses, Opportunities and Threats (SWOT) of Flipped Classroom?

Question 1 focuses to collect more in-depth firsthand data such as personal opinions from students after the experiential Flipped Classroom. Stances of students towards Flipped Classroom somehow reflect the feasibility of introducing Flipped Classroom in Hong Kong secondary schools based on the posteriori of students which they need to experience once before they reflect their feelings, thoughts and ideas.

And then Question 2 aims to find out the significantly influential factors of Flipped Classroom in Self-Directed Learning motivation of students. Both positive and negative motivational effects will be considered and studied. Specific reasons and examples are expected to be listed out.

As for Question 3, Strengths, Weaknesses, Opportunities and Threats (SWOT) of Flipped Classroom is supposed to provide a more comprehensive review combining teacher observation with supportive quantitative and qualitative data.

Literature Review: Flipped Classroom

Emphasized by Sharma, Lau, Doherty and Harbutt (2015), the rationale behind Flipped Classroom:

> Flipping the classroom centres on the delivery of print, audio or video based material prior to a lecture or class session. The class session is then dedicated to more active learning processes with application of knowledge through problem solving or case based scenarios. The rationale behind this approach is that teachers can spend their face-to-face time supporting students in deeper learning processes. (p.327)

Therefore, teachers perform as facilitators rather than instructors in the Flipped Classroom, and interactive teaching and learning activities should be the focus of the lesson instead of one-way teaching. Students firstly watched the pre-class instruction at home and then teachers would lead the in-class interaction to finish the assessment or dispel confusion of students. As pointed out by Bergmann and Sams (2012), "Flipping the classroom establishes a framework that ensures students receive a personalized education tailored to their individual needs" (p.6).

Dr. Eric Mazur of Harvard University also advocated the view that since advanced internet technologies stimulate the knowledge transfer, teachers should refocus their teaching on knowledge internalization instead of information transmission to fulfill flipped learning (November & Mull, 2012). In other words, the class time for information transmission such as solely direct instruction should be minimized, while the class time for knowledge internalization such as teacher-student interaction or peer interaction should be maximized by the nature of Flipped Classroom.

In other words, Flipped Classroom reinvents teaching and learning through devoting more class time to constructivist activities and meaningful learner-instructor interactions (Khan, 2012).

Literature Review: Self-Directed Learning

The process of Self-Directed Learning first starts with the individuals taking the initiative with or without the assistance of others to diagnose their own learning needs, and then formulating their own learning goals and identifying available human and material resources for learning, after that they choose and implement appropriate learning strategies and finally evaluate their learning outcomes (Knowles, 1975).

Linking back into Flipped Classroom, problem-based learning (PBL) was defined as one of the theoretical frameworks for the Flipped Classroom, and one of the six characteristics of PBL mentioned 'new information is acquired through Self-Directed Learning' with the goal of developing Self-Directed Learning skills and intrinsic motivation (Bishop & Verleger, 2013). Therefore, Flipped Classroom hopefully develops students' Self-Directed Learning and stimulates students' self-motivation in out-of-school learning.

Research Methodology

This research involved 97 students from a Hong Kong Band2A CMI secondary school as individual subjects under the consent of the school. The 6-week trial of experimental Flipped Classroom was conducted in the Computer Literacy (CL) lessons from Form 1 to Form 3, and Information and Communication (ICT) lessons of Form 4. There were 8 participated classes in total, for Form 1 to Form 3 each class was in half size because of the limited area of the computer room at school:

2 classes in Form 1:	2 classes in Form 3:
1B, 1D	3C, 3D
3 classes in Form 2:	1 class in Form 4:
2B, 2C, 2D	4AB mixed

The participated numbers of students were different in each class as every participant could decide if they agreed to participate in the research. In some cases, the parents did not sign the consent form, this kind of participation would not be counted even if participants signed the consent form. The qualified and counted participants in each class are shown below:

1B: 13	3C: 16
1D: 13	3D: 15
Form 1 Sub-Total = 26 students	Form 3 Sub-Total = 31 students
2B: 6	4AB mixed: 10
2C: 13	
2D: 11	
Form 2 Sub-Total = 30 students	Form 4 Sub-Total = 26 students

Therefore, Form 1 to Form 4 Total = 97 students

Delivery Mode

During the 6-week trial of experimental Flipped Classroom, each Form was taught with different units. Therefore, different delivery modes of Flipped Classroom were adopted. Existing video and screenshot tutorials online were selected as the out-of-school learning materials for Form 1 word processing lessons. Form 1 students had to finish the hands-on exercise during the lesson by live demonstration in front of the whole class.
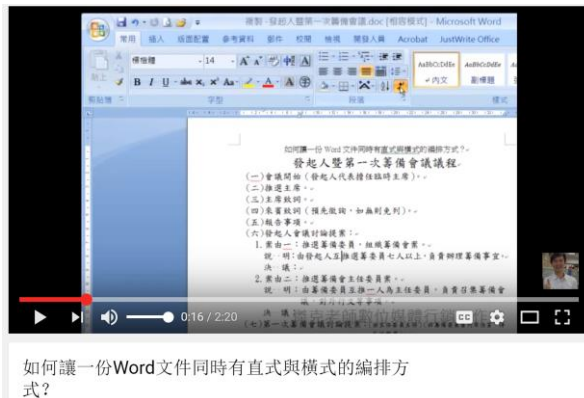
Similar approaches were applied for Form 3 number and symbol coding system, while the delivery combined with the previous knowledge of spreadsheet for including some practical software skills for the topic instead of solely mathematics calculation.

As for the Form 2 Scratch, a tailor-made sample game was designed to Form 2 students with guided questions. The guided questions helped students explore the game by themselves. The game was an upgrade version from the one listed in their workbook. Students were expected to find out and explain the differences during the in-class activity, conceptual knowledge could be even more important than basic completion of game design by each student because students could create and customize their own games without any assistance if they truly understood the programming logic.

Since Form 4 recently started with text-based programming, the Flipped Classroom oppositely focused on graphical programming for them to self-study the basic programming concepts by Hour of Code provided from code.org. The students left behind were expected to catch up the topic easier through graphical programming and thus resulted in less learning diversity.

The examples of Flipped Classroom self-study online materials are shown below:

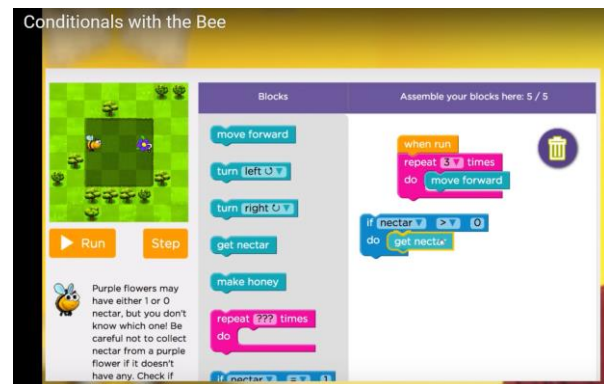| Form 1: Word processing	Form 3: Number and symbol coding system
如何讓一份Word文件同時有直式與橫式的編排方式?	你不知道的事情 計算機(2) 二進制 十進制 十六進制
Form 2: Scratch programming	Form 4: Pascal programming
Bigger Fish Deeper Sea by s1106386	Conditionals with the Bee

Design-Based Research Framework

The experimental trial of Flipped Classroom was also theoretically refined and enhanced through the characteristics of design-based research by emphasizing posteriori with complex social interaction and followed by flexible design revision (Barab & Squire, 2004). Adapted from the theory, the design-based research cycle will support both lesson delivery and retrospective planning with the flow of thinking from reviewing "what, how and why" to revise the arrangement according to the situation. Students were asked to answer the related questions during the in-class activity, for example, what they have learnt from the materials and lessons, how the materials helped them to prepare the lesson, why they thought so. After the lesson, the flow of thinking continued with retrospective purpose, for instance, what did students achieve from the lesson, how the lesson should be improved, why the delivery mode of lesson should be kept or adjusted.

Combining teaching and learning reflection into revision, the delivery modes were enriched. At the beginning, there was only video and screenshot tutorials as the online Flipped Classroom materials since the knowledge application would be conducted during the in-class activity of Form 1 students for learning word processing skills. Students had to finish the task in front of class to get the daily mark. After few students were volunteered to complete the task, the remaining students were too shy to follow even if they knew the answer. Therefore, they were encouraged to come up in pair and every student could get the daily mark eventually throughout the lessons.

Moving on to other forms without the daily mark policy, knowledge exploration was emphasized in the task-based learning of Flipped Classroom. Both tailor-made and existing sample game were provided to students with designed questions prior to the lessons. Students would be chosen to answer those questions as the opening of lesson before the in-class demonstration and hands-on exercises.

Providing sample game exploration instead of video and screenshot tutorial was mainly because programming required computation thinking rather than software skills. Students could not directly skip the game to the end like video or screenshot, they really had to code it right even if the programming became block-based. Therefore, the design-based research characteristics also resulted in variety of Flipped Classroom teaching and learning materials matching with the specific topics.

Data Collection and Analysis

This research adopts mixed methods approach with quantitative questionnaire and qualitative interview. The questionnaire was uploaded onto the Google Form and the data collected was converted into a csv file and eventually imported to the SPSS for basic statistics with calculation of mean and standard deviation. 97 participants completed the questionnaire. And 11 out of 97 participants voluntarily participated in the semi-structured interview. The interview contents were audio recorded for finding out the common themes. Both questionnaire and interview questions were designed according to the categories from Technology Acceptance Model (TAM) and Self-Regulated Learning (SRL).

Technology Acceptance Model (TAM) included various indicators such as perceived usefulness, attitude, behavior intention, self-efficacy, subjective norm, etc (Davis, 1986). These kinds of indicators can become evidences of showing how students change before and after their experiences of Flipped Classroom, for example, comparing their confidences or value judgements towards programming, they might feel unconfident in programming or think it had no value before Flipped Classroom teaching and learning, while their thoughts may be totally different after it. And these kinds of technology acceptance for Flipped Classroom would possibly affect their effectiveness of Self-Directed Learning and self-motivation in out-of-school learning. As for the question design, learning habit, learning preference and learning difficulty also supplement as the 3 major perspectives of questionnaire statements theoretically based on Self-Regulated Learning (SRL) Model reflecting students' attitude and efficacy (Pintrich, 1994). For example, "I would use the Flipped Classroom online resources provided from teacher to prepare my lesson" can be one of the statements related to learning habit and behavior intention, "I prefer Flipped Classroom rather than traditional lesson." can reflect the learning preference and attitude of students, and "It is easy for me to access the Flipped Classroom online resources provided from teacher." can be the statement regarding learning difficulty and self-efficacy. 5 options will be listed for every questionnaire statement: strongly agree, agree, neutral, disagree and strongly disagree. Strongly agree will score the most for 5, from high to low, agree for 4, neutral for 3, disagree for 2 and strongly disagree for 1. The higher students score, the more positive the attitude of they have towards Flipped Classroom, and the higher the feasibility Flipped Classroom reaches.

Table 1 Scores of items assessing students' perceived usefulness of Flipped Classroom

	No.	M	SD
Usefulness			
1. Learning a topic through Flipped Classroom is useful	97	3.72	1.058
2. Fulfilling learning objective through Flipped Classroom is workable	97	3.75	1.011
3. Flipped Classroom can satisfy my learning needs	97	3.79	1.030

Table 2 Scores of items assessing students' attitude of Flipped Classroom

	No.	M	SD
Attitude			
4. I enjoy the in-class lesson of Flipped Classroom	97	3.78	1.012
2. I enjoy the self-learning process of Flipped Classroom	97	3.79	1.060
3. I prefer Flipped Classroom rather than traditional lesson	97	3.89	1.030

Table 3 Scores of items assessing students' behavior intention of Flipped Classroom

	No.	M	SD
Behavior Intention			
1. I would use the Flipped Classroom online resources provided from teacher to prepare my lesson	97	3.80	0.986
2. Flipped Classroom makes me more enthusiastic in self-learning during my leisure time	97	3.78	0.949
3. I wish to keep learning through Flipped Classroom in the future	97	3.86	1.010

Table 4 Scores of items assessing students' self-efficacy of Flipped Classroom

	No.	M	SD
Self-Efficacy			
1. It is easy for me to access the Flipped Classroom online resources provided from teacher	97	3.89	0.967
2. I am confident to learn a topic through Flipped Classroom	97	3.91	0.958
3. I can fulfill the requirements from teacher in Flipped Classroom	97	3.96	0.923

Table 5 Scores of items assessing students' subjective norm of Flipped Classroom

	No.	M	SD
Subjective Norm			
1. My classmates agree with the learning model of Flipped Classroom	97	3.86	1.031
2. My parents support me to learn through Flipped Classroom	97	3.81	0.917
3. My teacher provides me sufficient support throughout the process of	97	3.92	0.965

In overall, the mean from 5 different categories ranged from 3.72 to 3.96, reflecting the impact of Flipped Classroom on the motivational effects of students' Self-Directed Learning tend to be positive, especially in self-efficacy which scored the highest among 5 categories, answered to the research question 1.

As for the focus-group interview, the 11 voluntary participants were also the endorsed participants from those 97 students: 3 Form 1 students, 2 Form 2 students, 4 Form 3 students, 2 Form 4 students. Most of them had no experience in the topic taught in the Flipped Classroom before the lesson. Only Form 1 students mentioned they learnt about the word processing in the Primary school, while they felt those lessons were not as interesting as Flipped Classroom because of too much direct instruction of teacher. And one of the Form 2 students also mentioned he has used the offline version of Scratch in his Primary school. Since these students were minority in number, the impact of students' previous knowledge towards the same topic has been minimized as expectation.

Since this research assumed students had no experience in Flipped Classroom before, the semi-structure interview did not include pre-designed question for students' previous experience of it, while 2 Form 3 students recalled their similar experiences from their recent Mathematics lesson.

Their Mathematics teacher applied a platform called Schoology and uploaded teaching resources onto it. And the follow-up in-class activities also matched with the online resources and the teaching topic. One Form 4 student recalled his teacher sent him a learning game to try at home, and then they had further discussion during the lesson. Possible differences in opinions could thus be studied when comparing the reflections of these 3 experienced students as minority with the remaining interviewees as majority.

Combining the SWOT analysis into the perspective of perceived usefulness, the interview followed by investigating the strengths and weaknesses of Flipped Classroom. Students were asking to answer the most useful feature and the biggest limitation of it according to the 6-week-trial of experimental lessons. Most students mentioned Flipped Classroom provided them flexible way of learning according to their own progress, and more opportunities for practical practice for more in-depth knowledge. A Form 3 student recalled "I can actually skip the part I understood and focus on the part I did not know when I was watching the videos at home." A Form 2 student said, "I could practice more on Scratch with the game you sent us and we knew more about programming because of it since it was not only about gaming." However, students also mentioned monitoring, technical difficulties and timeliness could be the limitations of Flipped Classroom. "I could not try to follow the video at home because I did not have the Microsoft Office." mentioned by a Form 1 student. "Teacher could not monitor how students learn at home." reflected by a Form 4 student. "We could not immediately ask teacher if we did not understand about the learning resources at home." told by a Form 2 student, while another Form 3 student reflected differently "We only need to tell teacher about what we do not understand so teacher do not need to repeat the easy parts during the lesson".

As for the attitude of students towards Flipped Classroom, students were asked to answer if they enjoyed the in-class activity and the self-learning process of Flipped Classroom by reasons. None of them recalled any bad feelings towards the Flipped Classroom. On the contrary, they told about the reason why they did enjoy the Flipped Classroom. Most of them described their Flipped Classroom learning experience as "interactive" and "interesting". Besides, a Form 2 student told, "Flipped Classroom stimulates my curiosity to find out the answer by myself". Although there was no negative description from students, a Form 3 student compared his feelings between the in-class activity and the self-learning process, "in-class activity is more interesting than the self-learning process." With further asking he said it was because in-class activity involved more face-to-face interaction.

Motivation of Self-Directed Learning was the main indicator to measure the behavior intention of students. They were asked to answer if Flipped Classroom enhanced their intention of self-learning. "I feel great if I successfully clear the game." a Form 4 student recalled his Hour of Code experience in Flipped Classroom with sense of achievement. "With the online practice in Flipped Classroom I can have better preparation before the lesson." a Form 1 student recalled his preview experience in Flipped Classroom. On the other hand, a Form 3 student mentioned her lack of intention because of laziness, "I may be too lazy to have preparation or revision if I have understood the topic already." Besides, when Form 1 students reflected they did not have homework burden in Flipped Classroom, Form 3 students oppositely mentioned Flipped Classroom could be a homework burden for them since they needed to finish the exercise on time. They were also asked what if teacher did not clarify the Flipped Classroom exercise as their homework, they honestly laughed and told, "Then we will simply skip the exercise."

Therefore, how Flipped Classroom was operated could affect the behavior intention of students, while the personalities and characteristics of students most critically determined their perceptions and actions towards the Flipped Classroom.

If students thought it was easy for them to adapt to the Flipped Classroom, they had higher self-efficacy towards it. A Form 2 student told, "Since I am used to watch online tutorials, I can understand and follow the Flipped Classroom videos more easily." showed students familiar with self-study fit in the Flipped Classroom more smoothly. "I can play the coding game whenever and wherever I am." reflected the convenient accessibility of Flipped Classroom learning resources. The Form 1 student without Microsoft Office software at home was further asked if he had unpleasant experience when accessing the Flipped Classroom materials, he said he did not feel too frustrated because "I can still watch the videos and jot notes." No negative user experience was reported by students since they felt they were capable and confident to learn through the Flipped Classroom.

Students had to think about who will support or against the Flipped Classroom for evaluating the subjective norm of it. "I think my classmates would also support Flipped Classroom like me if they also think it is fun." A form 1 student tried reasoning the overall feedback for Flipped Classroom by his classmates. Most students thought parents, teachers and schools would also support Flipped Classroom if they think it can help their children or students learn better, while some students mentioned it could be against by conservatism. "I guess some parents might not support it since they are used to study by textbook in the past, they might not trust or believe

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their children can learn anything from a video or even a computer video." a Form 2 student tried to think different from his own stance. "I guess some teachers would also be against Flipped Classroom since it might increase their workload." Form 3 students tried to extend the laziness factor to the teacher level by analogy.

Summarizing the views of students from the 5 categories above, neither unpleasant feelings nor frustrating experiences from the experimental Flipped Classroom were mentioned. Therefore, students' views on introducing Flipped Classroom in secondary school tend to be positive and supportive, answered to the research question 2.

Table 6 Keywords of Common Themes From Students' Feedback Towards Flipped Classroom

| Perceived Usefulness	Attitude	Behavior Intention	Self-Efficacy	Subjective Norm
Flexible	Curiosity	Achievement	Accessibility	Feedback
In-Depth	Interactive	Practice	Familiar	Participation
Practical	Interesting	Preparation	Personality	Interest
Monitoring		Homework		Conservative
Technical		Laziness		Workload
Timeliness		Understood		

As a student teacher introduced the experimental Flipped Classroom in this research, the above quantitative questionnaire results and qualitative interview results are supplemented with teacher observation for a more comprehensive SWOT Analysis.

Table 7 SWOT Analysis of Flipped Classroom within 3 Reasons

Strengths	Weaknesses
1. Flexible and personalized learning pace in control	1. Rely on internet connection inevitably
2. Wider and deeper learning across topics through practice-makes-perfect basis	2. Rely on participation of students even out-of-school
3. Interactive and inspiring nature for stimulating thoughts and ideas	3. Rely on reflection of students for teacher to understand the situation
Opportunities	Threats
1. Arouse students' interest once again in a different way from the traditional lesson	1. Possible cheating during out-of-school learning process
2. Transform students' enquiry into customized in-class activity	2. Conservative stakeholders prefer doing nothing but the same
3. Cultivate students' self-study and self-exploration habits with designed guideline	3. Sidetracked students focus wrongly during their online learning

According to the concise SWOT Analysis, the neutral but critical role of students' learning motivation towards Flipped Classroom determines either it plays to its strengths or plagued by its weaknesses. Even though Flipped Classroom could perform as a multiplier of Self-Directed Learning effectiveness with its positive motivational effects proved above, any number multiplied by zero is still zero, students with no motivation and participation still cannot enjoy the benefits of Flipped Classroom. However, it was unreasonable to blame Flipped Classroom for it because those students cannot be considered as actual participants of it. For example, we

cannot blame sports for not making us healthier if we do no sports whatsoever. For same reason if students with no participation and motivation in Flipped Classroom failed to improve their Self-Directed Learning, it was not the fault of Flipped Classroom because they did not experience anything with it at all.
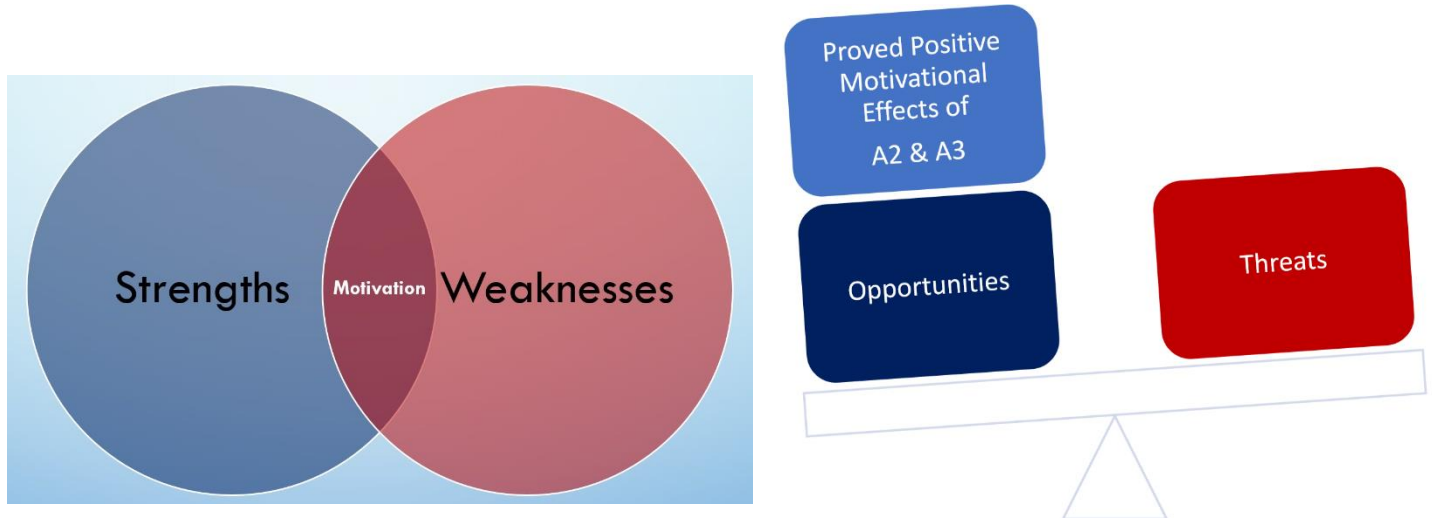
When strengths and weaknesses are more likely the nature of Flipped Classroom which are less controllable, opportunities and threats are much more controllable because they depend on how we apply Flipped Classroom. Assume opportunities and threats share the same influence, there are still some potential opportunities from the proved positive motivational effects of Flipped Classroom towards Self-Directed Learning in research question 1 and 2. Considering these hidden factors, the SWOT analysis answered in the research question 3 can be more accurate and comprehensive.

Suggestions

During the 6-week trial of Flipped Classroom, students' change of behavior existed. The supporting teacher of Form 2 reflected a student pay more attention than usual during the lesson. That student even could answer the questions related to the Flipped Classroom materials provided prior to the lesson. Although the reasons for the motivational changes of that student can be other than the positive motivational effects of Flipped Classroom towards Self-Directed Learning, for example, personal or situational reason like interest towards topic, teacher can still try to implement Flipped Classroom to get students involved in a different way from the traditional lesson. Let students feel the difference and they may behave different because of it. The origin of Flipped Classroom for dealing with the student absence somehow carried out the similar idea.

Even though there was no significant difference between the feedback from minority students experienced in Flipped Classroom and non-experienced students as majority, the opposing views of homework burden and laziness were actually raised by those 2 experienced students despite they also mentioned other supporting views. They also perceived the reduced one-way instruction as students had to do more in class, while most students thought less direct instruction in Flipped Classroom made the lesson more interactive. When the more experienced students could reflect more opposing views of Flipped Classroom, it implies teacher needs to be aware of boredom when repeating the same teaching method. No matter how inspiring or how successful the Flipped Classroom this time, it does not mean teacher need to apply it for every topic. Extremes meet and less is more, teaching innovation should never stop.

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Future Work

Since the population scale was only limited in one school in this research, the research results could possibly be different in another school. Moreover, the participants were from Form 1 to Form 4 only. The motivational effects of Flipped Classroom towards Self-Directed Learning still remain uncertain for more senior students like Form 5 and Form 6, its influences on academic achievement were also unsure, particularly for public-exam-oriented learning. The future work of Flipped Classroom study can also explore its impact on other subjects, and involve more teachers' participation for their views on Flipped Classroom based on their firsthand experience.

(Word Count: 4,493)

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Appendix

a. Questionnaire Questions in Chinese

認知實用度(Perceived Usefulness)

句子	非常同意	同意	中性	不同意	非常不同意
1. 透過翻轉教室學習課題是有用的					
2. 以翻轉教室完成學習目標是可行的					
3. 翻轉教室能滿足我的學習需要					

態度 (Attitude)

4. 我享受透過翻轉教室上課的過程					
5. 我享受透過翻轉教室自學的過程					
6. 比起傳統上課，我更喜歡翻轉教室的學習模式					

行為動機 (Behavior Intention)

7. 我會善用老師提供的翻轉教室網上資源備課					
8. 翻轉教室令我更熱衷於課餘自學					
9. 我希望未來能夠繼續以翻轉教室模式學習					

自我效能 (Self-Efficacy)

10. 接達老師提供的翻轉教室網上資源對我來說是容易的					
11. 我對透過翻轉教室學習課題有信心					
12. 我能夠完成老師在翻轉教室對我的要求					

主觀規範 (Subjective Norm)

13. 我的同學認同翻轉教室的學習模式					
14. 我的父母支持我透過翻轉教室學習					
15. 我的老師在翻轉教室過程中給予我足夠的支持					

Google Form Results:

https://docs.google.com/a/s.eduhk.hk/forms/d/1cYKJ3DK35Iz2OBg_gg5vKakWoFyhk7pIzixGcbcoMYQ/edit#responses

b. Semi-Structure Interview Questions in Chinese

學習背景 (Learning Background)

1. 在透過翻轉教室學習相關課題之前，你是否已曾經接觸/學習過相關課題？例如。。。

認知實用度(Perceived Usefulness)

2. 你認為透過翻轉教室學習課題最有用的地方是甚麼？為甚麼？

3. 你認為透過翻轉教室學習課題的最大限制是甚麼？為甚麼？

態度 (Attitude)

4. 你享受翻轉教室上課及自學的過程嗎？為甚麼？

行為動機 (Behavior Intention)

5. 你認為翻轉教室提升了你自主學習的動機嗎？為甚麼？

自我效能 (Self-Efficacy)

6. 你覺得翻轉教室的教學模式容易適應嗎？為甚麼？

主觀規範 (Subjective Norm)

7. 你覺得身邊有哪些人會認同翻轉教室的教學模式？為甚麼？

Recordings

Form 1: https://drive.google.com/file/d/0BxhjFQcsfY3jeE5GODNMNDdHNG8/view?usp=sharing

Form 2: https://drive.google.com/file/d/0BxhjFQcsfY3jczBlNWg0d3dvaXM/view?usp=sharing

Form 3: https://drive.google.com/file/d/0BxhjFQcsfY3jRGlZTVpEWFk5TFU/view?usp=sharing

Form 4: https://drive.google.com/file/d/0BxhjFQcsfY3jZ1ZmUjBIMEJVYzg/view?usp=sharing

c. Translated Interview Common Themes Analysis

F1	F2
+ ***no homework burden***	+ guided self-learning matches with the in-class activity, ***remember more***
+ can try at home	
+ more **interactive** in-class activity with **reduced one-way instruction**	+ more flexible based on different self-learning progress, pause on demand or skip when understood
+ information searching skill during self-learning	+ more practice during the self-learning
+ students learn more in Flipped Classroom by *interactive* in-class activity relaxing and friendly	+ stimulate students' curiosity to find out answers by themselves during the self-**learning process**
+ more dedicated to learning if it is fun	+ arouse students' interest by variety of learning materials, for example, improve typing by online competitive typing games
@ In-class activity is more interesting than learning at home	Learning style of students are different. It is easier for students to fit in Flipped Classroom if they are **used to** watch tutorial videos
@ Cannot try at home if there is no office software at home (**technical limitation**)	+ more room to think about the same topic
	@ ***Can only ask question directly in-class even if encountered problems at home***
	@ Cannot know if students have completed
	@ If students have **no interest** towards the subject, they will not learn or explore by themselves even if they were **leaving behind**
	@ possibly opposed by conservative stakeholders, for example, parents learnt by traditional textbooks in their youth may not understand how to learn by videos or games

F3	F.4
+ *remember more* because out-of-school learning and in-class activity match with each other + can boost the in-class process because students only have to ***ask teacher*** what they did not understand at home + expand self-learning questions and findings into ***interactive*** in-class activity + more opportunity to use computer + easy to adapt to it because students are **used to** online platforms @ *no immediate feedback* from teacher if encountered problems at home @ can be a **homework burden** to students if teachers require them to finish self-learning exercise by a deadline @ but if it is not a homework, some students with **low learning incentive** may not even view the resources at home as they are not self-motivated @ students actually have to do more when time for **direct instruction is reduced** @ resources selected by teachers may not be as interesting as students can find	+ reduce learning difficulty by allowing students to learn from different ways + online resources as better preparations for the new topic + help students **left behind** to catch up + learn whenever and wherever you want, more freedom if self-directed @ students' diversity in their **learning progress** even if the resources are the same @ can be unnecessary if students master the topic already @ may **lack incentive** to do so as no one to push @ teachers may oppose because of more workload and monitoring