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The Education University of Hong Kong

Honours Project

Department of Curriculum and Instruction

"Investigating the application of flipped classroom approach in Secondary school computer lesson in enhancing students' learning autonomy"

Submitted by

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Declaration

I, *Yip Wing* Tung , declare that this research report represents my own work under the supervision of *Dr. Yang Min, Assistant Professor of the Department of Curriculum and Instruction,* and that it has not been submitted previously for examination to any tertiary institution.

Signed

Yip Wing Tung

5/5/2020

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1. Abstract

As a future educator of technology education in secondary school, an essential and responsibility for me are to explore the practical approach to supporting students' learning. The present research aimed to explore the potential of the flipped classroom approach in improving a group of form two students' learning interest and efficiency in computer lessons at a local secondary school. A mixed-method approach was applied to collect both quantitative and qualitative data. It is hoped that the research results could be beneficial and encourage to computer education with regards to whether the advocated learning benefits of flipped classrooms can be realized for my students, which in turn would provide valuable information for educators in the technology education field.

Keyword: flipped classroom, autonomy, technology, secondary school

2. Introduction

In the 21st century, with the growth of technology, the traditional teacher-centered approach may not be appropriate for teachers to apply in education since today's students are "learners of the digital era" (Rapetti & Cantoni, 2010) especially in technology education. In Hong Kong, "flipped classroom" has become a new teaching and learning strategy for both teacher and students that suggested by the Education Bureau to apply in schools. Flipped classroom is a teaching model that changes the traditional lecture-based teaching into student-centered, which enables teachers to spend less time in direct instruction of content and thus affords more opportunities for teacher-student and peer interaction and learning support for students (Ozcan & Genc, 2016). Students are required to acquire knowledge by watching teacher-prepared instructional videos or resources before the lesson.

Since it has a number of advantages, flipped classrooms have been supported by different scholars as a practical approach to teaching. The flipped classroom has impacts on students in learning, such as fostering students 'active learning and academic performance. Moreover, students' learning attitudes, motivation, and self- directed learning are also enhanced in high school when applying a flipped classroom approach (Chao, Chen & Chuang, 2015). One of the advantages is on students' self- directed learning as it is one of the most important elements for students in studying technology education since it related to innovation and creativity with basic knowledge. In turn, self-directed learning is a way to achieve learner autonomy so that students could gain skills and attitudes for life-long learning. Another advantage is the improved efficiency of learning and teaching because of additional time available for teach-guided learning activities.

3. Literature Review and Research Questions

Literature Review

3.1 Definition and models of flipped learning

There are many terms for flipped classroom strategies such as reversed instruction and inverted classrooms (Bergmann & Sams, 2012) and flipped learning (add references). Based on Figure 1, flipped classrooms change the traditional learning environment, whereas students acquire the content of the learning topic by practices at first and assimilating their knowledge by discussion or debates to help them get access to the concepts (Brame, 2013).

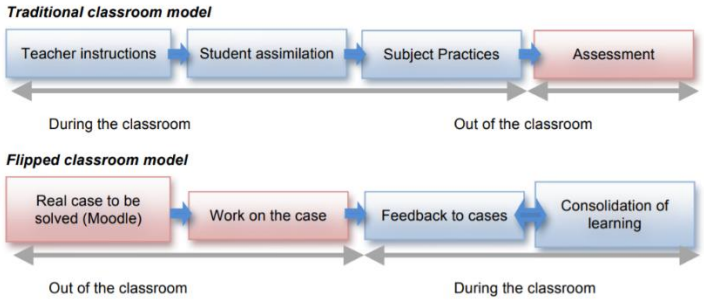


Figure 1. Traditional classroom model versus Flipped classroom the case

Bishop & Verleger (2013) suggested that the flipped classroom approach includes

inside and outside classroom methods. That is, it may involve students in group learning activities in the classroom and individual learning activities through technology-based instruction outside the classroom. Figure 2 summarizes the procedures of Flipped Classroom Model.

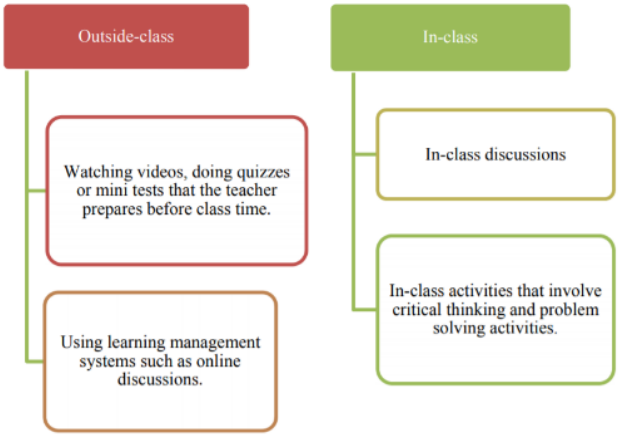


Figure 2. Procedures of Flipped Classroom Model

Moreover, Bishop & Verleger (2013) stated that it is essential to include video lectures, inside class activities and interactive learning activities in order to meet the requirement of the flipped classroom. Based on Kong (2014), the work in the flipped classroom could be separated into three parts: pre-class for learning preparation, in-class learning activities, and post-class learning consolidation. In the pre-class preparation, students could use online learning platforms in an autonomous way to learn. In the in-class activities, both teachers and students need to be engaged in discussing, presenting, and simulating the lesson content (Tucker, 2012). For the post-class learning consolidation, students could undertake revision on learning materials to strengthen the learning outcomes base on the lesson.

In sum, in flipped classrooms, the teacher does not simply use an inversion of the usual teaching sequence. Still, more importantly, they need to stimulate students' own learning initiatives by engaging them in activities that require them to think and practice independently. Under flipped classrooms, it is no longer a teacher's monologues in a lesson but returning learning time to students, which allows them to collaborate, understand and solve problems at a higher level (Acedo, 2013). Students are no longer merely sitting on their seats and waiting for teachers' one-way teaching. Still, they need to take further steps to cooperate, discuss, or even complete a task with others more consciously.

3.2 Teachers and students 'attitudes on a flipped classroom

Understanding both teachers and students are critical on determining the best way for implying flipped classroom as this approach would only be successful if both of them are embracing it, and they are the stakeholders that associative with the most. An online survey conducted by ClassroomWindow and Flipped Learning Network (2012) examined teachers' perceptions of flipped classrooms. It is found that half of the respondents observed there was an improvement in their student's standardized test scores after the implication of the flipped classroom approach. Furthermore, near 90% of students improve their learning attitude. Apart from teachers' perception of the flipped learning approach, students' views on it are also could not neglect as their attitude are the effective force in the learning process and outcome. Herreid & Schiller (2013) illustrated that certain STEM (Science, Technology, Engineering, Mathematics) educators have revealed that the use of the flipped classroom approach had positive impacts on students, especially in behavior. Gaughan (2014) indicated that nearly eighty percent of students in her study felt that the videos helped them most of the time. Nonetheless, over twenty percent of students reported that videos did not help much in preparing the following lesson. The negative responses from students were mostly due to the difficulties in watching the videos before the lessons so that they were unprepared for the lesson. Overall, Gaughan (2014) admitted that a flipped classroom was regarded as a successful method that could apply in school because most students in her research contributed to group discussions with enthusiasm.

3.3 Relationship between flipped classroom approach and students' learning autonomy in school education

Regarding Overmyer (2012), there is a potential to increase students' motivation, engagement, and learning autonomy in applying the flipped classroom method. There are two significant advantages of utilizing the flipped approach that helps students to develop learning autonomy. Firstly, students could have the flexibility to move based on their own pace, levels, and interests to focus on different videos or materials. In the flipped classroom, instructional videos provide an opportunity for learners to "rewind, replay and review," which can make them handle the teaching theme with ease (Walsh, 2013). It could also promote student autonomy, differentiation, and personalization of learning (Davies et al., 2013). Secondly, activities focusing on lower-order skills such as memorization would be removed from class-time as in-class time is for interaction and collaboration, and higher-order skills such as analyzing and evaluating can be

engaged in class with teacher and peer supports (McGivney-Burelle & Xue, 2013). Moreover, a study by Long, Ming & Chen (2013) showed that learning motivation could significantly influence the ability of autonomous learning directly. The term autonomy includes a variety of different forms and behavior such as learning context, the process of learning, and learner characteristics. Autonomy also referred to independent learning after school or home study. Research indicates that learner autonomy in the flipped classroom approach has important effects on students' self-responsibility and learning strategies (Bayat, 2011). Flipped classroom approach gives student adequate chances and helps them to develop autonomy on participating in outside class activities since learners could select various learning instruments and adapt them differently. In the present research, there is an importance to analyse whether flipped classroom can help students of different levels of academic achievements to develop their learner autonomy.

Research Questions

There are two research questions in the study:

1. How does flipped classroom approach affects students' learning autonomy?
2. What are students' attitudes and perceptions on flipped classroom?

4. Research Design and methods

4.1 Research background

The research was conducted in computer lessons from 23rd October to 29th November in 2019 in a coeducational secondary school, which was my placement school at the same time. The course design and theme were based on the placement school schedule.

4.2 Research participants

There were 23 secondary two students in the same class for the experiment target, and it was voluntary participation. Since it is essential to follow the teaching schedule of my placement school, the teaching theme in the secondary two students was iMovie, which means all the teaching materials during the application of flipped classrooms were related to this video editing software. Before the commencement of this study, the study was passed the ethics review process of the Education University of Hong Kong. Moreover, participants have been informed of the purpose and method of the study and conducted with the knowledge and consent from the placement school principal, participants themselves, and their parents.

4.3 Methods and tools of data collection

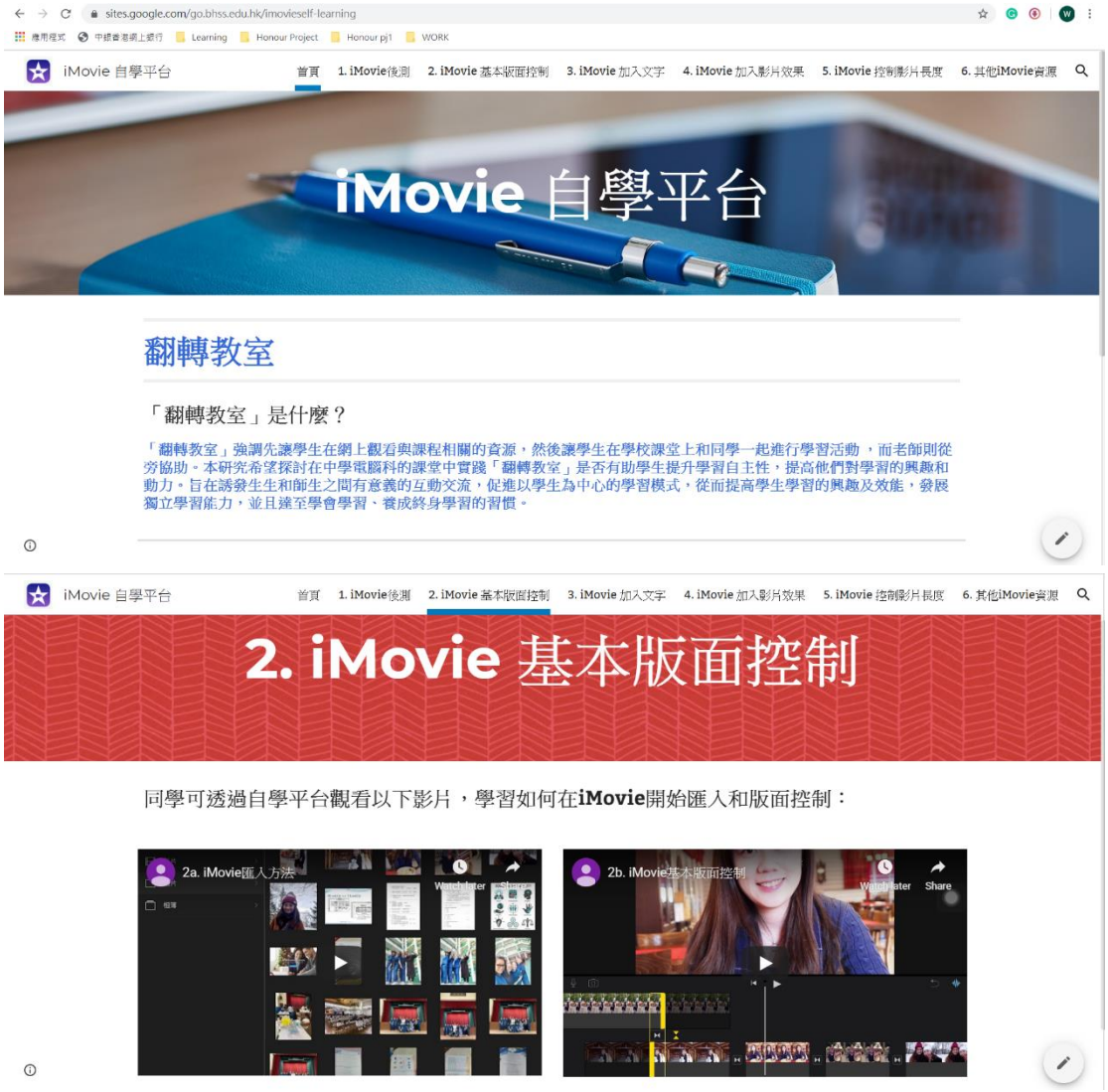
To develop a flipped classroom framework, design-based research was applied in the study. According to Anderson and Shattuck (2012), design-based research is situated in a real educational context, using the mixed method. The design-based research method is suitable for iterative, cyclical processes of design, implementation, analysis, and evaluation. Due to time constraint, there was only one cycle was implemented in this research. There are four interconnected phases in design-based research: (1) analysis students' prior knowledge by pre-test and design, (2) implementation and evaluation in an iterative process, (3) analysis, and (4) reflection (Herrington, Reeve & Oliver, 2010). In this research, both quantitative and qualitative data were collected. There is an appropriate course design for experimental students on the pre-test, post-test, and questionnaire in the quantitative method and focus group interview for the data collection. I used a class that will teach by myself as an experimental group for the implementation of the flipped classroom.

4.3.1 Out-side class activities in the flipped classroom

A designed website with instructional videos

Outside class activities for the experimental class, instructional videos, and relevant websites and resources were given to students for access before the lesson. I used a

Google Site to create a website that includes all the instructional videos, pre-tests, pro-tests, and other relevant resources for students during the teaching theme - iMovie. Instructional videos have been based on the subject and topic that I taught during the placement, which was iMovie. I used online platform YouTube and Google Drives and shared it in the designed Google site so that students could directly watch them via YouTube application or in Google Drives. There are nine instructional videos in total, and students could learn step by step from section two on the designed website.



Link: https://sites.google.com/go.bhss.edu.hk/imovieself-learning

Implement pre-test and post-test on academic performance

This study included pre-test and post-test to explore students' academic performances and observe the effectiveness of the teaching approach between flipped classrooms and traditional lecture classrooms. For the sampling strategy in pre-and post-test was convenience sampling. I used a convenient sample which was a class I taught in the

placement school. There were 23 students took part in pre-test and post-test. Questions are based on the theme iMovie and taken up with three different levels of multiple choices from the easiest to hardest. Both pre-test and post-test are involving ten questions.

For pre-test and post-test, I would analyze the differences in the result in each question, such as the correct percentages.

4.3.2 In-class activities in flipped classroom

For in-class activity, students have received worksheets and required to complete in a group with two to three persons. They reconvene in the class for group discussions, group work, and presentations. Students were created their video by using iMovie this software and based on the requirement listed in the worksheet. At the end of the lesson, all students successfully completed the group works and presentation.

Observation

The observation was carried out while applying the flipped classroom approach in class to increase the validity of analysis during the lessons. Moreover, it also observed the level of engagement and involvement during the group discussion and presentation in flip class. It aims to record students' facial expressions on both positive and negative expressions. Apart from class observation, there was an online observation in the pre-class and out-class activities in the flipped classroom. Observations would not be for detailed analysis but using them for validating and supporting the result in pre-test and post-test, questionnaire and interview.

4.3.3 Questionnaire about students' autonomy and learning outcomes

The questionnaire was taken to explore and analyze students' learning autonomy and learning outcomes before and after applied flipped classroom teaching and learning method. For the sampling strategy in the questionnaire was convenience sampling same as pre-and post-test. There were 23 students completed the questionnaire. The questionnaire was using the combination work of two types of research called "Exploring the Student's Learning Outcomes in the Context of a Flipped Classroom Teaching Model and the Interaction between Learning Outcomes and the Satisfaction Factors" conducted by Gu Huei-Zhen in 2017 and "Teaching ICT with the Flipped

Classroom Approach in Higher Education Settings" by Lai, Ng & Yang in 2018 as references. After modifying the questionnaire that fit my topic, a final of the questionnaire was adjusted to from a five-point Likert scale.

I would use the Likert scale to measure how students feel about the effect of the flipped classroom and their learning autonomy. The choices in the questionnaire would come from "Strongly disagree" to "Strongly agree" or "Highly dissatisfied" to "Highly satisfied." These chooses are representing a number scale from rating 1 to 5. I would analyze each question with a mean and analysis is there any differences after applying the flipped classroom in the questionnaire. Since my placement school is a Chinese as the medium of instruction school, therefore the designed questionnaire was in Chinese version, but the English version was also prepared. There are 14 questions in total, and questions one to four would be regarding students' perception and satisfaction of learning activities and understanding by applying the flipped classroom approach. For example, "The way teacher taught in flipping the classroom?" and "The arrangement of teaching activities in the flipped classroom?". Question five to nine are more focused on their learning habitat and attitude while in using flipped classroom in the lesson. For example, "I will try to learn as much as possible when watching the video" and "I can learn the topic iMovie of my computer lesson on my own.". Question ten to thirteen are focus on their changes in learning. For example, "Before/ After the implementation of flipped classroom teaching, my learning habits are?". Detailed questionnaire could refer to Appendix A.

4.3.4 Focus group interview

The qualitative data collected through the student's semi-structured interview. For the sampling strategy in group interview was purposive sampling. The selection criteria to choose student took part in interview was based on students' achievement in the class group-work. Therefore, 6 students with high, middle and low achievement were interviewed. Students' perception interview questions were based on Snowden (2012). Students' discussions were given to obtain their perspectives on applying flipped classroom in computer lessons. To see whether there are any advantages, challenges, and differences from using flipped classroom approach and modify the best way in teaching and learning for students in the computer lesson. After the completion of interviewing with students, I based on the content from the students' interview recordings and turned it into a transcript. Moreover, I selected specific important

responses and opinions from the recording to help analyze the results more specific and accurate.

4.4 Ethical Considerations

As a responsible researcher, it is responsible for me to treat all participants equally without any discrimination, no matter their role at school. The research will avoid any physical and psychological harm for all participants as ethical issues were taken into consideration. As those students who are under 16 could not give consent for participating in the research; therefore, a consent form would be given to parents that they noticed and agreed to their children on participation in the questionnaire. Moreover, unnecessary information of students would not be included in the research. All the participant information would keep confidential. The focus group interview was conducted inside the campus that could ensure the discussion in a high level of privacy and under a no disturbing condition.

4.5 Research Implementation

This study adopted one group pre-test post-test research design that including pre-test and post-test to observe students' learning autonomy and academic performance under the application of the flipped classroom method. Before accepting the flipped classroom, all participants completed a pre-test on the designed website one week before the implementation of the flipped classroom started. After completed the pre-test, I taught how to use the website to watch those instructional videos.

Figure 3. An overview of the research process

Table 1: Timeline of the learning activities and data collection for experimental students

Event	Theme	Learning activity/Data collection method
Lesson 0 (31nd October 2019)	Basic operation of Microsoft Excel	● Continuing to use traditional lecture method in class Before the end of lesson, the teacher would ● assign pre-test about the theme

		"iMovie" which is the next lesson topic that starts to apply flipped classroom ● announce the usage of flipped classroom and the Google site about the next lesson topic "iMovie" ● inform student could go to visit the google site, watch instructional videos students need to ● complete pre-test in class before the end of lesson ● visit the google site after class, watch instructional videos
Lesson 1 (4th November 2019)	Basic operation of iMovie	● First attempt to apply the flipped classroom method in class Before lesson, students may ● watch online instructional videos on the Google site ● complete post-test after watching online instructional videos on the Google site During lesson, students may ● involve in-class discussion ● involve in group work At the end of lesson, students need to ● hand in the classwork After lesson, teacher collects group works
Lesson 2 (6th November 2019)	The essential operation of iMovie	● Second attempt to apply the flipped classroom method Before lesson, students may ● watch online instructional videos on the Google site

		• complete post-test after watching online instructional videos on the Google site During lesson, students may • involve in-class discussion • involve in group work At the end of the lesson, students need • hand in classwork • present their videos • complete post-test after watching online instructional videos on the Google site • complete the questionnaire After lesson, teacher collects group works and presents their finished videos. After lesson, the teacher invites students for a group interview. The date for group interview would be confirmed within one week.
Focus Group interview (29^{th} November 2019)	The essential operation of iMovie	

4.6 Methods of Data Analysis

Based on Creswell (2014), there is mixed method design called explanatory sequential that could apply in educational research. The main purpose of this method design are cross-verification and validation. By following this design, researchers need to collect quantitative and qualitative data and do comparison on the outcomes. In this study, the outcomes of pre-test, post-test, questionnaires and interviews would be analyzed and informed.

After collecting all the questionnaires from students, I imported all quantitative data into a spreadsheet to convert all questionnaire responses to number format for further use Statistical Package for the Social Sciences (SPSS) to analyze. Moreover, excel forms were imported to SPSS version 26.0 for Windows and using descriptive statistics

and paired-samples t-test to perform analytical processing. Regarding Hinton, McMurray & Brownlow (2014), using descriptive statistics could generate an accurate description and dispersion of the overall data.

For the focus-group interview, I extracted the content of the interview and through content analysis introduced by Carter & Neville (2014) in the use of triangulation to analyze students' wordings and expressions and extract part of the sentence and cognitive language for systematic and objective analysis by using descriptive statistics.

5. Findings

5.1 Students' perceptions and opinions on flipped classroom

Before the course, most of the students had no preconceived ideas and never experience about flipped classroom. Teachers normally demonstrate how to use software in class time with the usage of e-books.

*"Maybe something like **leaving the classroom**?"* (Student 4)

*"No, I **never heard about it**."* (Student 3)

*"In previous days, we got hardcopy books. But for now, it changes to **e-books**."* (Student 5)

According to the result from questionnaire, a majority of the students' hold a positive perception towards the implication of flipped classroom. Referring to Figure 4, 78.3 % of students declared that they felt satisfaction of the way to imply flipped classroom in computer lesson than traditional classroom while just 21.7% of them chose "Fair". Apart from the implication of flipped classroom, most of the students also had a high agreement on the arrangement of the learning activities that used during classroom.

Way teacher taught in flipping the classroom, I feel

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	5	21.7	21.7	21.7
	Satisfaction	10	43.5	43.5	65.2
	Very Satisfied	8	34.8	34.8	100.0
	Total	23	100.0	100.0	

Figure 4. Students' perception on flipped classroom

Referring to Figure 5, students had same responses on the activities setting as shown in Figure 4. 78.3 % of students stated that they felt satisfaction on the arrangement of learning activities in flipped classroom while only 21.7% of them chose "Fair". Furthermore, some students in focus-group interview also given some positive reviews on flipped classroom.

*"We **usually sleep** during computer lessons **before**."* (Student 3)

*"Most of the time we read textbook in class **before** which **is boring**."* (Student 5)

Compared with previous teaching method, which is traditional classroom, students have lower intension on sleeping and felt interesting with the usage of flipped classroom such as the instruction videos and self-learning platform.

Arrangement of teaching activities in the flipped classroom, I feel

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	5	21.7	21.7	21.7
	Satisfaction	10	43.5	43.5	65.2
	Very Satisfied	8	34.8	34.8	100.0
	Total	23	100.0	100.0	

Figure 5. Students' perception on the arrangement of flipped classroom

5.2 Effect of flipped classroom on students 'learning outcome in pre- and post-test

Referring to pre-test and post-test on the teaching theme "iMovie," Figure 6 shows that there is 23 numbers of valid samples and the means scores that students got before and after applying the flipped method on the same online quiz. Before the application of flipped classroom, the mean score of students in pre-test is 2.7 out of 10 which means most of the students had a bad performance as the passing mark is 5 while the post-test is 5.7. This data shows that the mean scores were higher after the course and most students have a better performance in post-test with a passing mark. The difference of mean scores between pre-test and post-test is 3, which means most of the students did have improvement on understanding and subject knowledge after the flipped classroom instruction.

Scores on Pre-test and Post-test

		Difference	Pre-test	Post-test
N	Valid	23	23	23
	Missing	0	0	0
Mean		3.00	2.70	5.70
Std. Deviation		2.468	1.717	1.795

Figure 6. Students' scores on pre-test and post-test in iMovie quiz

Apart from comparing the mean scores of pre-test and post-test, paired-samples t-test has also used as referring to Figure 7, the p-value = 0.00007<0.05 which proves that the results show a significant level and students the significant difference in learning achievement after the teaching experiment.

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Score on Pre-test and Post-test before and after flipped classroom	-3.000	2.468	.515	-4.067	-1.933	-5.830	22	.000

Figure 7. Students' scores on pre-test and post-test in paired-samples t-test

5.3 Effect of flipped classroom on students 'learning outcome in questionnaire and interview

Referring to the questionnaire results on "understanding the content" as shown in Figure 8, 78.2% of students agreed that they could follow and comprehend the content during the flipped classroom which means flipped method did have influence on their learning progress and knowledge-absorption. The majority of students were able to follow the video instruction on the learning content as a way to support their learning progress. It seems that in a significant portion of students have positive learning outcomes on flipped classrooms. However, not all the students considered the flipped classroom environment capable on their learning. Some students in focus-group interview also reviewed that they had certain concern and reflect on learning in flipped classroom:

"Attending lessons at school as ***teachers can express better*** *in the classroom"* (Student 3)

"Teachers can ***express more detailed*** *in person."* (Student 5)

Students mentioned that teacher can have a better and deeper explanation in traditional teaching method rather than recorded lessons by using instructional videos so that students may learn more concrete and better in absorb information.

Fully understand the content of the class by flipped classroom approach

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	5	21.7	21.7	21.7
	Agree	9	39.1	39.1	60.9
	Strongly agree	9	39.1	39.1	100.0
	Total	23	100.0	100.0	

Figure 8. Students' understanding on the content and knowledge in flipped classroom

5.4 Effect of flipped classroom on students 'learning interest

Although more than half of students hold neutral view on their learning desire in flipped classroom as shown in Figure 9, the remaining students stated strong desire on it which means students have yearn for learning under flipped classroom.

Overall, the desire of learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	13	56.5	56.5	56.5
	Strong	10	43.5	43.5	100.0
	Total	23	100.0	100.0	

Figure 9. Students' learning desire in flipped classroom

On the "enhanced learning interest" as shown in Figure 10, 73.9% of students indicated the agreement, while just 26.1% of them chose "Fair". It can be interpreted that a majority of students found that flipped classroom activities were beneficial to their learning of the topic and also increased their learning interest. Students in focus-group also have below responses to the question: when asking the question "What class style/instructional method can enhance your learning interest?":

*"Watching **iMovie videos** can let us know the steps of how to **make it by ourselves**."* (Student 1)

"*I prefer **self-learning platform** because it is **more interesting***. (Student 3)

*"I think is **self-learning platform** because it **is more newness**."* (Student 5)

Students replied that flipped classroom is possible to increase their learning interest as it is a kind of interesting and newness learning method. Moreover, those instructional videos could also provide a chance for students to manage their learning process and receiving knowledge mostly by their own. For the observation, most students were opening the self-learning website automatically consciously when doing the group discussion and they were focusing on those instructional videos. Moreover, most of them were enjoying to watch it and focusing with their groupmates on discussion.

Enhanced learning interest by flipped classroom approach

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	6	26.1	26.1	26.1
	Agree	9	39.1	39.1	65.2
	Strongly Agree	8	34.8	34.8	100.0
	Total	23	100.0	100.0	

Figure 10. Students' perception of flipped classroom in enhancing their learning interest

5.5 Effect of flipped classroom on students' learning autonomy

Referring to the questionnaire results on "self-learning on the lesson topic" as shown in Figure 11, 73.9% of students agreed that they could learn on their own on the topic "iMovie" by watching instructional videos. Moreover, in order to enhance students' understanding, 65.2% of them reviewed that they had the action by pausing or repeating those segments of those instructional videos as shown in Figure 12. It is possible to prove that flipped classroom could promote student autonomy and personalization of learning (Davies et al., 2013) as students have intension in rewinding and replying

(Walsh, 2013). Furthermore, more than half participants reported in Figure 13 that they were try as much as possible when watching the videos. They had intention on attempting to gain for themselves as much under flipped classroom. From the observation, most students were opening the self-learning website automatically consciously when doing the group discussion and some of them even add the self-learning platform in favorite in their iPad. Most of them were focusing on those instructional videos during the discussion and some of them apply some functions and effects I did not mentioned or teach in the website which means some students had further learning after watching those videos.

Can learn the topic iMovie of my computer lesson on my own

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	6	26.1	26.1	26.1
	Agree	13	56.5	56.5	82.6
	Strongly Agree	4	17.4	17.4	100.0
	Total	23	100.0	100.0	

Figure 11. Students 'self-learning ability in flipped classroom

Frequently pause or repeat segments of the videos in order to increase my understanding of the material

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	8	34.8	34.8	34.8
	Agree	9	39.1	39.1	73.9
	Strongly Agree	6	26.1	26.1	100.0
	Total	23	100.0	100.0	

Figure 12. Students' intention on watching instructional videos

Try to learn as much as possible when watching the video

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fair	10	43.5	43.5	43.5
	Agree	8	34.8	34.8	78.3
	Strongly Agree	5	21.7	21.7	100.0
	Total	23	100.0	100.0	

Figure 13. Students' intention while watching instructional videos

Referring to Figure 14, it shows the results of students learning habit before and after the application of flipped classroom. In overall, most students had a positive changed on their learning habit after flipped classroom. Before the application, one student reported that he/she did not have any learning habits while one student reported that he/she changed to learn in every day. Students not only changed their learning habit after flipped classroom, their time that spent on learning and study are also have a significant increase as the histogram shown in Figure 15. Before the implementation of flipped classroom, the average learning time for students is around 54 minutes in every week while it changed to 74 minutes in every week after the implementation.

Before the implementation of flipped classroom teaching, my learning habits are:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Learning Habits	1	4.3	4.3	4.3
	Before test/exam	5	21.7	21.7	26.1
	Sometimes	13	56.5	56.5	82.6
	Fixed Time	4	17.4	17.4	100.0
	Total	23	100.0	100.0	

After the implementation of flipped classroom teaching, my learning habits are:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Before test/exam	2	8.7	8.7	8.7
	Sometimes	14	60.9	60.9	69.6
	Fixed Time	6	26.1	26.1	95.7
	Everyday	1	4.3	4.3	100.0
	Total	23	100.0	100.0	

Figure 14. Students' learning habits before and after the flipped classroom

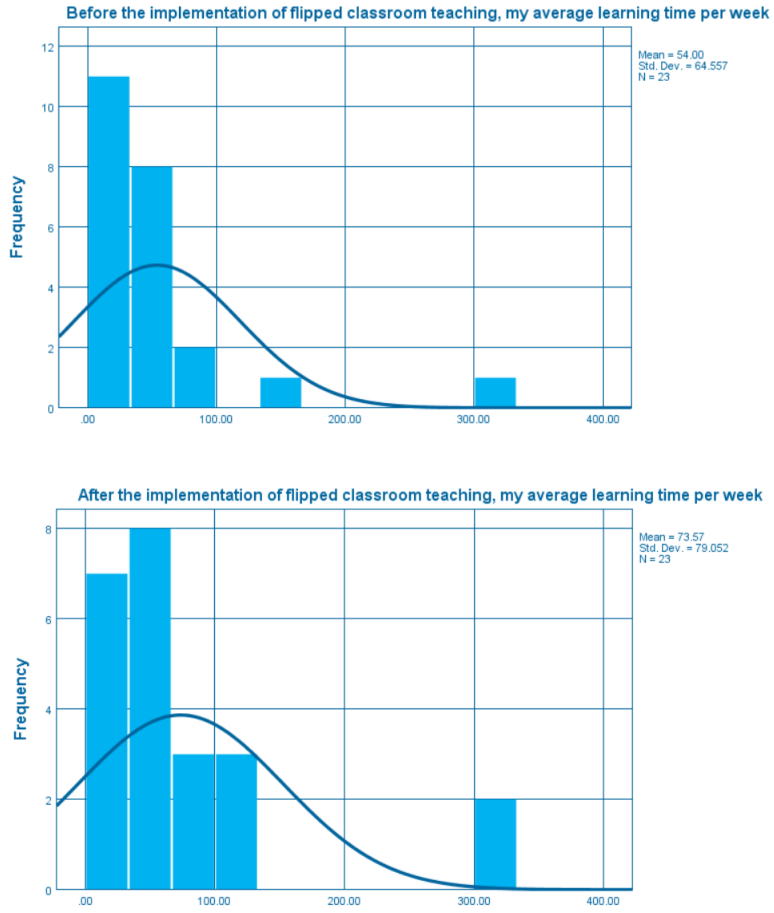


Figure 15. Students' average learning time before and after the flipped classroom

Students in focus-group also have below responses to the question: when asking the question, "Do you think you have a low/high learner autonomy when you have computer lessons?":

"Low." (Student 1)

*"Of course, **high autonomy**."*(Student 2,3,4,5)

*"We learn **very actively** in class."* (Student 4)

*"We might **lack motivation** if doing this **at home ourselves**."* (Student 1)

*"**Still do more** and work **at school**"* (Student 4)

Thus, it can be seen that most of the students had to enhance their learning autonomy after flipped classrooms from the result on the questionnaire and responses on interviews. Some students reviewed that their motivation for learning may differ due to their learning environment. They mentioned that they might have higher motivation in learning in class or at school instead of staying at home.

6. Discussion

After combining those results from pre-test, post-test, questionnaire, observation, and interview in this research, it shows the following phenomena:

1. Students have a positive attitude and feel satisfaction in the application of flipped classrooms in a computer lesson.
2. Flipped classrooms have generally positive effects on students learning autonomy to a great extent.

Positive attitudes and feel satisfaction on the flipped classroom

Although the flipped classroom is a new thing for students as most of them never heard about the term flipped classroom or have any experience in this pedagogy before this research, most of the students still feel satisfaction and hold a positive opinion on the way and structure towards it. This research shows that there is a possibility that students' having a positive perception of the flipped classroom that may boost their learning interest and academic performance in some circumstances. For example, they enjoyed learning and did not resist or feel inadaptable during the flipped classroom. Moreover, the previously mentioned feeling and action are positive signs as students were willing to explore and try during the learning process. Although after completing flipped classroom, students 'post-test mean scores were not exceptionally despite their positive attitudes, they have high participation and reactions during class which could not be neglected. Since the teaching theme iMovie is more on practical instead of simply knowledge, most of the students have good performance on their final products(videos) based on students' reactions during the presentation. Due to the fairness of the research, student products were not used as indicators of performance. Some students had already have some basic knowledge on using video-editing software apart from iMovie, therefore, I did not choose to use the final product as the indicators of performance

instead of using a post-test as all students did not use this video-editing software before. However, it proved that learning students' learning anxiety and negative emotion in learning becomes less during the flipped classroom. It helps to promote or further apply flipped methods (Marlowe, 2012).

Flipped classroom have active effects on students learning autonomy to a great extent

Under flipped classroom, students had a high engagement in both in-class and out-class activities such as group discussion, watched those videotaped lectures and online materials at home. Before starting the class, all students already watched those videos at home, and they directly have a discussion with their classmates in exchanging ideas in class. Students already have the intention to be prepared for a lesson." (Smith, 2003). Although there is no standard measurement that could estimate students' changes in the level of learning autonomy, the research result has shown that most of the students spent more time on their study and further changing their learning habitat. They become more responsible for their learning after the flipped classroom as they would like to spend more time in their study and willing to repeat or pause those instruction videos for better understanding. It shows that those videos and self-learning websites are beneficial to their learning autonomy at the same time (Johnson, 2013).

Moreover, it also motivates collaborative works believed that students tried to explore more by themselves or discussion with their classmates.

However, there is still some situation that may affect students learning autonomy under the flipped method. Some students point out that the environment may affect their learning process. According to Ammar (2018), he stated that sometimes students'degree of learning could influence by the environment, such as different places and learning atmosphere. Some students seem to be more motivated when working with the learning material at arbitrary times while one student prefers to have a traditional lecture than the flipped classroom. She thinks the classroom gave more motivation for her, and she could be more focused on learning in class instead of at home.

In general, this research has shown that the advantages of applying flipped classrooms in computer lessons outweigh the disadvantages. It also revealed that there is some limitation of it. Based on the views from students, the flipped classroom may not have

that detailed demonstration and explanation than traditional lectures due to the restriction of time in instructional videos. Therefore, teachers may need to put effort into encouraging students to question more during the discussion. Perhaps teachers may also provide students with more opportunities for autonomous learning such as using flipped classroom, so that students will be readily adapted to self-paced learning activities.

7. Limitation

This research discovered that flipped classroom is possible to enhance secondary school students' learning autonomy. Since the experiment was taken in a secondary school, certain restrictions needed to coordinate with it. There are two limitations in this research, which are related to the small-scale of the study and lack of a research cycle. Firstly, the research was taken in my placement school, and not all the teaching themes are suitable to apply flipped classrooms, as flipping is not a "one size fits all" teaching strategy referring to Young (2017). Therefore, all data could only collect from one class based on the placement schools' teaching theme. This study does not include any control groups but only one experimental group in the same level. Regarding Lin (2015), a small sampling size may affect the power of the representativeness. Thus, it would be better to have another group as a control group to do a comparison or evaluation on the effectiveness in a deeper and more concrete to enhance the representation power. Due to the teaching schedule was fixed by placement school. Therefore this research could not entirely follow the structure of design-based research introduced by Anderson and Shattuck (2012). It mentioned that one of the elements in the design-based study are iterative cycles and have a period to redesign it after a cycle. In this research, we could not teach the theme in a research cycle but only in a single cycle. There is no time to improve the initial design after implementation, which may also affect the outcome and effectiveness of the flipped classroom.

8. Suggestion and Conclusion

Apart from applying the flipped classroom in technology subject, there are also some researchers found that there are solid advantages in applying flipped classroom in language and science subjects. AlJaser (2017) proved that flipped classrooms could promote students to become more independent learners in language learning, especially in the English language. Furthermore, it is also possible to enhance students' motivations and participation in science class (Elian & Hamaidi, 2018). Therefore, not only technology educators could be encouraged to apply flipped classrooms in their teaching but also those English or Science teachers.

It should be understood that as those restrictions have noted above, which may influence the findings of this research. It could not represent all the secondary school students' perceptions and attitudes on flipped classrooms in enhancing learning autonomy. However, it is undoubted that flipped classrooms could be one of the beneficial pedagogies for both teachers and students. Although not so many teachers have relevant experience in using flipped classroom on their teaching as it is not that mature or popular in Hong Kong, there is still a reference value from this research result for those educators who aimed to change a teaching strategy or wish to enhance students' autonomy in learning on students. "Learning is more than scoring," in order to achieve a better learning outcome, it is a responsibility for educators to try different teaching methods such as flipped classroom as it has numerous positives effects proved by different researchers on students not only on their academic performance but also on their motivation and learning interests.

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10. Appendix A:問 卷 調 查

<探 討 在 中 學 電 腦 課 應 用 翻 轉 課 堂 以 增 強 學 生 學 習 自 主 性 問 卷 調 查>

姓名_____ 學號( ) F.2C

註解: 翻轉教室上課是指將傳統上「課堂講課，回家寫作業」的教學流程倒轉，讓課堂上有更多元的活動。學生在下課時利用網上平台學習，課堂上由老師引導討論或完成任務等，從中獲得知識與技能。

1. 通過翻轉教室上課的方式，我能完全理解課堂內容。

□非常同意

□同意

□一般

□不同意

□非常不同意

2. 通過翻轉教室上課的方式，我提升了個人對學習的興趣。*learning interest*

□非常同意

□同意

□一般

□不同意

□非常不同意

3. 我對於教師在實施翻轉教室時的授課方式感到：

□非常滿意

□滿意

□一般

□不滿意

□非常不滿意

4. 我對於在翻轉教室上課時的教學活動安排感到：

□非常滿意

□滿意

□一般

□不滿意

□非常不滿意

5. 我喜歡能夠在上課時與老師交談，並在解決問題時得到幫助。***learning interest***

□非常同意

□同意

□一般

□不同意

□非常不同意

6. 我經常暫停或重複視頻片段，以增加我對課題的理解。

□非常同意

□同意

□一般

□不同意

□非常不同意

7.觀看視頻時，我會盡量學習。

□非常同意

□同意

□一般

□不同意

□非常不同意

8. 通過翻轉教室上課的方式，我可以自學有關 iMovie。

□非常同意

□同意

□一般

□不同意

□非常不同意

9. 總體來說，我對於本課程的學習渴望感到：

□非常強烈

□強烈

□一般

□薄弱

□沒渴望

10. 在實施翻轉教室教學前，我的學習習慣為：
□每天 □固定時間 □偶爾 □考前 □沒有學習習慣

11. 在實施翻轉教室教學後，我的學習習慣為：
□每天 □固定時間 □偶爾 □考前 □沒有學習習慣

12. 在實施翻轉教室以前，我每週的平均的讀書時間：每週約_____分鐘。

13. 在實施翻轉教室以後，我每週的平均的讀書時間：每週約_____分鐘。

14. 我願意/不願意參與有關翻轉教室活動的焦點小組訪談。

<Questionnaire on exploring the application of flipped classroom in middle school computer class to enhance students' learning autonomy>

Name_____ Class No.( ) F.2C

Note: Flipped classroom refers to reversing the traditional teaching process of lecturing in class and writing homework at home which aim in more diverse activities in class. Students can use the online platform to learn out of class, teachers can guide discussions or complete tasks in class, so as to acquire knowledge and skills

1. I can fully understand the content of the class by flipped classroom approach.

□Strongly agree

□Agree

□Fair

□Disagree

□Strongly disagree

2. I enhanced my learning interest by flipped classroom approach.

□Strongly agree

□Agree

□Fair

□Disagree

□Strongly disagree

3. The way teacher taught in flipping the classroom, I feel:

□Very Satisfied

□Satisfaction

□Fair

□Not satisfied

□Very dissatisfied

4. The arrangement of teaching activities in the flipped classroom, I feel：

□Very Satisfied

□Satisfaction

□Fair

□Not satisfied

□Very dissatisfied

5. I like being able to speak with my teacher during class and receive individual help when solving problems.

□Strongly agree

□Agree

□Fair

□Disagree

□Strongly disagree

6. I frequently pause or repeat segments of the videos in order to increase my understanding of the material.

□Strongly agree

□Agree

□Fair

□Disagree

□Strongly disagree

7. I will try to learn as much as possible when watching the video.

□Strongly agree

□Agree

□Fair

□Disagree

□Strongly disagree

8. I can learn the topic iMovie of my computer lesson on my own.

□Strongly agree

□Agree

□Fair

□Disagree

□Strongly disagree

9. Overall, the desire of learning in this course:

□Very Strong

□Strong

□Neutral

□Weak

□No Desire

10. Before the implementation of flipped classroom teaching, my learning habits are:
□Everyday □Fixed time □Sometimes □Before test/exam □No learning habits

11. After the implementation of flipped classroom teaching, my learning habits are:
□Everyday □Fixed time □Sometimes □Before test/exam □No learning habits

12. Before the implementation of flipped classroom teaching, my average study time per week：_____minutes every week.

13. After the implementation of flipped classroom teaching, my average study time per week：_____minutes every week.

14. I agree/disagree to participate in focus group interviews about flipped classroom.

Appendix B: Interview Questions

1. 你之前上電腦堂是如何的?你有聽過翻轉教室教學嗎?
2. 你認為翻轉教室教學與一般資通科課堂有什麼分別?
3. 你認為上電腦堂時自己有低/高學習自主性?為什麼?
4. 你認為翻轉教室教學有什麼地方吸引你?
5. 你認為以上提及吸引的地方電腦堂時會提升自己的學習自主性嗎?為什麼?
6. 你在翻轉教室教學的學習過程中遇到最大的困難/得著是什麼呢?試舉例。
7. 你認為怎樣的上課方式會令提升你學習興趣?
8. 你希望以後的課堂會多運用翻轉教室教學嗎?為什麼?

1. How do you feel about your computer lessons before? Have you ever heard of "flipped classroom approach"?
2. What do you think about the difference between flipped classroom approach and traditional classroom approach?
3. Do you think you have a low/high learner autonomy when you have computer lesson? Why?
4. Which part you think flipped classroom teaching method attract you?
5. Do you think the above mentioned attract parts could enhance your learner autonomy? Why?
6. What is the biggest difficulty that you encountered during the learning process in flipped classroom? Try to give an example.
7. What class style/instructional method can enhance your learning interest?
8. Would you like to have more application of flipped method in lesson in the future? Why?

Appendix C: Pre-test template

前測

姓名: 學號:

請圈上正確答案。

1. [容易程度]iMovie 是什麼?

A. 媒體播放器

B. 影片製作編輯軟件

C. 影片分享器

D. 不知道

正確答案: B

2. [容易程度]iMovie 內的濾鏡功能有什麼作用?

A. 增強或更改剪輯片段的外觀

B. 繪製旋轉文字

C. 自動顯示片段的字幕

D. 不知道

正確答案: A

3. [中等程度]iMovie 內最短的延長過場效果選項是?

A. 0.1 秒

B. 0.5 秒

C. 1 秒

D. 不知道

正確答案: B

4. [中等程度]如想在 iMovie 加入內置的音效，可以在哪些選項加入?

A. 時刻、主題音樂和音效

B. 媒體、主題音樂和音效

C. 歌曲、主題音樂和音效

D. 不知道

正確答案: B

5. [困難程度]iMovie 內的“Ken Burns”功能有什麼作用?

A. 放大或縮小

B. 快速結束效果

C. 旋轉調整

D. 不知道

正確答案: A

6. [中等程度]如想在 iMovie 中加入標題文字，可以在片段或照片上哪個位置加入?

A. 上方或下方

B. 上方、中央或下方

C. 中央或下方

D. 不知道

正確答案: C

7. [中等程度]在時間列中點一下剪輯片段時，選取的片段其外框會變成什麼顏色?

A. 白色

B. 黃色

C. 紅色

D. 不知道

正確答案: B

8. [困難程度]淡入和淡出效果是指?

A. 開頭從黑色畫面淡入和在結尾淡出至黑色畫面

B. 開頭從白色畫面淡入和在結尾淡出至白色畫面

C. 開頭從啡色畫面淡入和在結尾淡出至啡色畫面

D. 不知道

正確答案: A

9. [困難程度]在過場效果之外，影片剪輯片段中的什麼顏色部分去代表未使用的影片且不會在播放時顯示?

A. 黑色

B. 灰色

C. 啡色

D. 不知道

正確答案: B

10. [困難程度]iMovie 的內置主題由以下幾項組成?

A. 相片 、過場效果和音樂

B. 螢幕標題、過場效果和音樂
C. 濾鏡、過場效果和音樂
D. 不知道

正確答案: A

Appendix D: In-class Observation Checklist and Comment Form template

In-class Observation Checklist and Comment Form

What did you observe?	Rate 1-5 (1 is low, 5 is high)
1. Students asking questions	
2. Students working collaboratively	
3. Students on task/engaged in their work	
4. Active exchange of ideas	
5. Students are challenged	

Comments:

Appendix E: Focus group interview transcript

Date: 29 November 2019
Time: 3:30 p.m.
Venue: Room 310
Respondents: 6 Students from F.2C
Total Interview Time: 9mins37seconds

Transcript 內容	
	Q1:你之前上電腦堂是如何的?你有聽過翻轉教室教學嗎? ***How do you feel about your computer lessons before?*** ***Have you ever heard of "flipped classroom approach"?***
研究員 Interviewer:	第一條問題就是，你之前上電腦課的情況如何?你們有沒有聽說過翻轉教室教學呢?你們一開始之前上電腦堂是如何的? The first question is, "How do you feel about your computer lessons before?"
學生 3(S3):	下，睡覺。 We usually sleep during computer lessons before.
研究員 Interviewer:	除了睡覺呢?你們平時上堂主要做練習多還是學理論多? Except sleeping, did you guys learn computer knowledge in a more practical or theoretical way during lessons before?
學生 3(S3):	我們都是玩比較多。 We normally played in lessons.
學生 4(S4):	聽書多呀，我們是遊走學習。 I think we learnt our knowledge through reading the textbooks and walk around.
研究員 Interviewer:	即是直接有本書會跟住本書既。 You guys have hardcopy books for computer lessons?
學生 5(S5):	之前是書，現在就是電子書。 In previous days, we got hardcopy books. But for now, it changes to e-books.
學生 4(S4):	電子書。 Yes, e-books.
研究員 Interviewer:	即是之前有本實體書，現在就是電子書。你未上我之前呢一堂之前，你有沒有聽說過翻轉教室既教學法?

	Got it, so it changes from hardcopy books to e-books now. For flipped classroom approach, have you guys heard of any before?
學生 3(S3):	沒有。 No.
研究員 Interviewer:	有沒有聽過關於類似的? Haven't heard of something similar before?
學生 4(S4):	離開教室囉。 Maybe something like leaving the classroom?
學生 3(S3):	沒有聽過關於類似的。 No, I never heard about it.
	Q2:你認為翻轉教室教學與一般資通科課堂有什麼分別? ***What do you think about the difference between flipped classroom approach and traditional classroom approach?***
研究員 Interviewer:	你認為翻轉教室教學，即是我之前我地個主題是 iMovie，我們學 iMovie 的時候我就整了個網頁，讓你們自己回家看影片學習，而不是我給予你們一些實用書。你認為這一個教學的方法同我們一般平時上堂可能教 Excel 的方法有什麼分別? For flipped classroom approach, like the previous theme we learnt for iMovie, I had made a website with video recordings to show the steps for making the movie, instead of asking you guys to follow the hardcopy books' theory. Do you think there are differences between these two types of teaching methods?
學生 3(S3):	有。 Yes.
學生 4(S4):	好多分別。 Yes, many differences.
研究員 Interviewer:	例如有什麼分別? Can you tell me the differences?
學生 5(S5):	之前只是聽，依家多了親自做。 Watching iMovie videos can let us know the steps of how to make it by ourselves.

研究員 Interviewer:	你覺得哪一個好些?你覺得有一個網頁或者有其他資源可以讓你回家做呀?還是你喜歡上課聽老師教完你們再親自做? Do you guys prefer having online resources for you to follow the steps or having the teachers in classrooms?
學生 3(S3):	當然聽完之後親自做。如果不聽的話我們不懂做。 I think having teachers to teach in classroom is better as we can ask questions directly if we don't understand.
研究員 Interviewer:	那如果是 iMovie 這樣用一個網頁版讓你們自己學，你們覺得這個方法好些還是上課老師教? Then how about having a website for iMovie or letting the teachers to teach in classrooms is better?
學生 3(S3):	當然上課教完，老師說得好些。 Of course attending lessons at school as teachers can express better in classroom.
學生 6(S6):	但是那些影片都是老師錄喎。 The videos are also recorded by teachers.
學生 5(S5):	上課時會詳細些。 But teachers can express more detailed in person.
研究員 Interviewer:	即是你覺得上堂會詳細些? So you think attending lessons in classroom are more clear for you to understand?
學生 1(S1):	在家會時日都不想做。 Yes, and we might lack of motivation if doing this at home ourselves.
	Q3:你認為上電腦堂時自己有低/高學習自主性?為什麼? ***Do you think you have a low/high learner autonomy when you have computer lesson? Why?***
研究員 Interviewer:	你們認為上電腦堂的時候自己有個低還是高學習自主性呢? Do you think you have a low/high learner autonomy when you have computer lesson? Why?
學生 1(S1):	低。 Low.
學生 2(S2) +學生 3(S3)+學生 4(S4)+ 學生 5(S5):	當然高啦。 Of course high autonomy.

研究員 Interviewer:	為什麼呢?給予一些意見吧! 為什麼覺得自己有低還是高學習自主性呢? Why? Give some comments! Why do you think you have a low/high learner autonomy?
學生 4(S4):	因為我們很積極地去學習。 Because we learn very actively in class.
研究員 Interviewer:	好積極地去學習，嗯。但你們覺得上電腦堂時本身有高學習自主性還是因為用了翻轉教室會不會提高你的學習自主性?你會不會在家看多了東西?可能會用多了網頁去自己嘗試做?還是都是學校上堂做多些? Ok,you learn very actively. Do you think you have a high degree of learning autonomy is itself or because of using flipped classroom to enhance your learner autonomy? Would you watch or learn more at home? Maybe use the self-learning platflorm more and try to do? Or still do more at school?
學生 5(S5):	都有小小關係，但不會話看多好多。 A little bit relation but would not watch more.
學生 4(S4):	學校。 At school.
研究員 Interviewer:	都是學校做多些。 Still do and work more at school.
	Q4:你認為翻轉教室教學有什麼地方吸引你? ***Which part you think flipped classroom teaching method attract you?***
研究員 Interviewer:	你覺得翻轉教室教學吸不吸引到你在家裏看影片學習? Do you think flipped classroom teaching method attract you to watch learning materials like videos to learn?
學生 3(S3)	不會。 No.
學生 5(S5)	會。平時上堂都是看書多，好悶。 Yes. Most of the time we read textbook in class before which is boring.
學生 3(S3):	因為在家用電話看那些影片時，媽媽都以為我在玩和打機。 Because when I use my smartphone to watch those videos, my mum assumed that I am playing games.

研究員 Interviewer:	即是你覺得你用其他資源，例如在屋企用電話反而會影響你的學習? You mean that when you use other learning materials except textbook would affect your learning?
學生 6(S6):	不會。 No.
學生 3(S3)	不會。 No.
	Q5:你認為以上提及吸引的地方上電腦堂時會提升自己的學習自主性嗎?為什麼? ***Do you think the above mentioned attract parts could enhance your learner autonomy? Why?***
研究員 Interviewer:	你認為以上有地方吸引到你們上電腦堂時增加自己的學習自主性?有沒有什麼意見? Do you think the above mentioned attract parts could enhance your learner autonomy? Why?
學生 5(S5):	可以當在家裏上堂。 It seems like we could learn at home.
學生 4(S4):	可以在家裏好像補習一樣。 It seems like we are having a tutorial class at home.
	Q6:你在翻轉教室教學的學習過程中遇到最大的困難/得著是什麼呢?試舉例。 ***What is the biggest difficulty that you encountered during the learning process in flipped classroom? Try to give an example.***
研究員 Interviewer:	你覺得在翻轉教室教學的學習過程中最大的困難是什麼?例如看影片時有沒有困難? What is the biggest difficulty that you encountered during the learning process in flipped classroom? For example do you have any difficulty when watching the videos in the self-learning platform?
學生 2(S2) +學生 3(S3) +學生 4(S4)+學生 5(S5):	(搖頭) (Shake head)
研究員 Interviewer:	沒什麼困難。那麼你們遇到一些步驟不懂會如何處理?你們會不會有這種困難?iMovie 個題目的時候?

	No difficulty. When you find some steps you do not know how would you solve it? Do you have any problem like this when learning the theme iMovie?
學生 4(S4):	都不會。 No.
學生 3(S3):	順利呀。 Quite well the learning process.
研究員 Interviewer:	都算順利。 Ok. It all went smoothly.
學生 5(S5):	當然啦。都有問過老師，問下她。 Of course, we have asked teacher how to do.
研究員 Interviewer:	你們認為得著是什麼呢?你們透過上學習平台有沒有什麼得著?例如可能認識多些 iMovie 的東西，會自己找多些 iMovie 的?有沒有什麼得著? What do you think you learn or get? Did you get anything through the learning platform? For example, you may know more about iMovie and you will find more iMovie yourself? Is there anything you got?
學生 3(S3):	每個人有不同意見啦，我是有得著的。 Everyone have different opinons and I have learnt something.
學生 4(S4):	有。知道 iMovie 大概是什麼。 Yes. Know what is iMovie about.
研究員 Interviewer:	你自己對於 YouTube 個個運用呀應用提高了?iMovie 的應用運用提高了?對於拍片有多些興趣？對於 Ipad 有多些認識? Have you improved your use of YouTube? Your application of iMovie has improved? Have more interest in filming? Know more about Ipad?
學生 4(S4):	對用 iPad 拍攝有興趣同熟悉多了。 Know more and increase my interest on filming by using iPad.
研究員 Interviewer:	即是對於攝影功能方面有得著？ You means you have got something in filming?
學生 4(S4):	是呀。之前都不太懂用。 Yes. I did not know how to use before.
	Q7:你認為怎樣的上課方式會令提升你學習興趣?

	What class style/instructional method can enhance your learning interest?
研究員 Interviewer:	你認為哪一個上堂方式會提升你的學習興趣？你們喜歡有一個網上自學平台還是上課老師給予練習你自己做？ Which class style/instructional method can enhance your learning interest? Do you like online self-learning platform or teacher assign exercise or homework for you to do?
學生 5(S5):	我認為是學習平台，較新奇。 I think is self-learning platform because it is more newness.
研究員 Interviewer:	為什麼？為什麼學習平台可以提升你的學習興趣？ Why? Why do you think self-learning platform could enhance your learning interest?
學生 3(S3):	因為較有趣。 Because it is more interesting.
學生 4(S4):	因為老師會迫我們做。 Because teacher will enforce.
研究員 Interviewer:	這是自主的，你們自己可以選擇做或者不做。即是你們較喜歡反轉教室還是傳統上課方式？還是老師製作一些額外的東西你們在家或學校以外都可以學到？ This is autonomy, you could choose do or not to do. It means you prefer flipped classroom or traditional classroom? Do you think you cold learn the same at home or out of school if teacher make extra teaching materials to you?
學生 5(S5):	我較喜歡上堂。 I prefer having lesson in class to learn.
研究員 Interviewer:	你喜歡傳統上課多些？ You prefer traditional learning method?
學生 5(S5):	是的。 Yes.
	Q8:你希望以後的課堂會多運用翻轉教室教學嗎?為什麼? ***Would you like to have more application of flipped method in lesson in the future? Why?***
研究員 Interviewer:	那麼你們會不會希望未來會有多些機會運用反轉教室的教學呢？

	Would you guys want to have more chances to use flipped classroom for learning?
學生 5(S5):	可以呀。 Ok.
研究員 Interviewer:	那麼你們想不想遲些可能下學期其他主題例如學 App Inventor 一個學習程式，你會想運用翻轉教室有一些片段上課前去學習，還是好像傳統學習給予你們工作紙，老師上堂教完就立刻做? Do you guys want to apply flipped classroom in next theme such as “App Inventor” and give you some instruction videos before you go to class or traditional classroom provide you worksheet and complete it after teacher teach you in lecture?
學生 3(S3):	可不可以不在紙上做? Can we not finish it in a paper form?
學生 4(S4):	想用 Ipad 做。 Want to do it through Ipad.
研究員 Interviewer:	你們會不會想有額外的資源去事前學習，例如有平台或者老師透過拍片，你們回家可以看因爲如果有些同學在學校缺席他們就未必懂，你們認為翻轉教室這個教學方法有沒有效?
學生 3(S3):	有。 Yes.
學生 4(S4):	有。 Yes.
學生 5(S5):	有，因為老師的短片在輔助之下，自己再想下就可以完成到。 Yes, because with help of the instruction videos that recorded by teacher, I further think some ideas then I could complete it.
研究員 Interviewer:	你們覺得對於你們的學習來說，iMovie 如果不是用這個傳統方法用網上學習平台，你們比較喜歡那一種？自主學習還是我上堂教你們你們再自己做? If iMovie this theme still using traditional lectures instead of self-learning platform, which one you prefer to use? Self-learning one or teacher teach in class and give you time to finish?
學生 4(S4):	自主學習。

	Self-learning.
研究員 Interviewer:	因為對於 iMovie 你們認為你們本身需不需要對 iPad 有一定的認識? Based on the learning theme “iMovie”, do you think you need some understanding on using iPad?
學生 3(S3):	要呀。 Need.
學生 5(S5):	是。 Yes.
研究員 Interviewer:	如果本身對於 ipad 不太認識的話，你們認為會不會有困難，或者有沒有聽過其他同學有說過 iMovie 好難或者不太知道如何運用? If someone is not familiar with the usage of ipad, do you think it will have difficulties or do you heard any classmates have mentioned iMovie is difficult or do not know how to use it?
學生 3(S3):	不會。 No.
學生 4(S4):	沒有。 No.
研究員 Interviewer:	你們自己都可以都掌握到運用 iMovie? You guys could handle to use and apply iMovie?
學生 4(S4):	自己學。 I learnt it by myself.