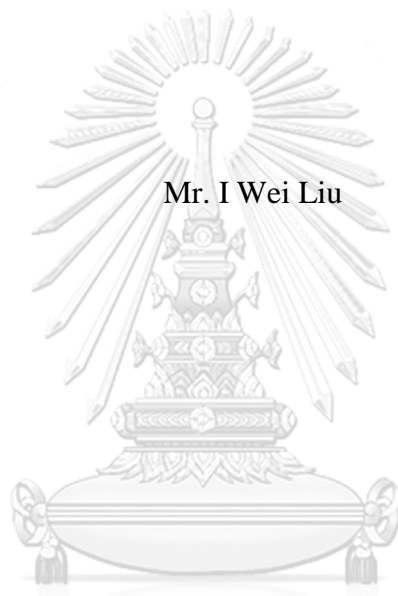# THE EFFECTS OF DEBATE INSTRUCTION THROUGH A FLIPPED LEARNING ENVIRONMENT ON SPEAKING ABILITY AND CRITICAL THINKING SKILLS OF THAI HIGH SCHOOL STUDENTS

Mr. I Wei Liu

A Dissertation Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy Program in English as an International
Language
(Interdisciplinary Program)
Graduate School
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ผลของการสอนโต้วาทีผ่านกระบวนการเรียนแบบกลับด้านต่อความสามารถทางการพูด และการคิดอย่างมีวิจารณญาณของนักเรียนไทยระดับมัธยมศึกษา

นายไอ เว่ย หลิว

Thesis Title	THE EFFECTS OF DEBATE INSTRUCTION THROUGH A FLIPPED LEARNING ENVIRONMENT ON SPEAKING ABILITY AND CRITICAL THINKING SKILLS OF THAI HIGH SCHOOL STUDENTS
By	Mr. I Wei Liu
Field of Study	English as an International Language
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ไอ เว่ย หลิว : ผลของการสอนโต้วาทีผ่านกระบวนการเรียนแบบกลับด้านต่อ ความสามารถทางการพูด และการคิดอย่างมีวิจารณญาณของนักเรียนไทยระดับ มัธยมศึกษา (THE EFFECTS OF DEBATE INSTRUCTION THROUGH A FLIPPED LEARNING ENVIRONMENT ON SPEAKING ABILITY AND CRITICAL THINKING SKILLS OF THAI HIGH SCHOOL STUDENTS) อ. ที่ปรึกษาวิทยานิพนธ์หลัก: ดร. พรพิมล ศุขะวาที, 292 หน้า.

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อ (1) พัฒนาการเรียนการใช้คำแนะนำการโต้สาระวาทีใน ห้องเรียนกลับด้าน, (2) ศึกษาผลสัมฤทธิ์ของความสามารถในการพูดภาษาอังกฤษของนักเรียน หลังจากได้รับการปรับใช้คำแนะนำการโต้สาระวาทีในห้องเรียนกลับด้าน, (3) ศึกษาถึงผลสัมฤทธิ์ ของทักษะการคิดเชิงวิพากษ์ของนักเรียนหลังจากใช้คำแนะนำในห้องเรียนกลับด้าน และ, (4) ศึกษาความคิดเห็นของนักเรียนเกี่ยวกับการใช้คำแนะนำในการโต้สาระวาทีในสภาพแวดล้อม ห้องเรียนกลับด้านนักเรียนชั้นมัธยมศึกษาตอนปลาย ในกรุงเทพมหานครจำนวน 22 คนที่ได้รับ เลือกเป็นกลุ่มตัวอย่าง

ผลการวิจัยพบว่า 1) ความสามารถในการพูดภาษาอังกฤษของนักเรียนดีขึ้นหลังจากใช้ คำแนะนำการโต้สาระวาทีในห้องเรียนกลับด้าน 2) มีการพัฒนาการในทักษะการคิดเชิงวิพากษ์ของ นักเรียนหลังจากใช้คำแนะนำการโต้สาระวาทีในห้องเรียนกลับด้าน 3) นักเรียนมีความคิดเห็นเชิง บวกต่อคำแนะนำในการโต้สาระวามีในห้องเรียนกลับด้าน ผลการศึกษานี้ให้หลักฐานเชิงประจักษ์ ถึงประสิทธิภาพของสภาพแวดล้อมในห้องเรียนกลับด้านและให้ข้อมูลเชิงลึกที่เป็นประโยชน์ สำหรับนักเรียน, นักศึกษา, ผู้สอนและสถาบันการศึกษาในการสอนการพูดภาษาอังกฤษ

| สาขาวิชา | ภาษาอังกฤษเป็นภาษานานาชาติ | ลายมือชื่อนิสิต | |
| ปีการศึกษา | 2560 | ลายมือชื่อ อ.ที่ปรึกษาหลัก | |

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I WEI LIU: THE EFFECTS OF DEBATE INSTRUCTION THROUGH A FLIPPED LEARNING ENVIRONMENT ON SPEAKING ABILITY AND CRITICAL THINKING SKILLS OF THAI HIGH SCHOOL STUDENTS. ADVISOR: PORNPIMOL SUKAVATEE, Ph.D., 292 pp.

The study aim (1) to develop debate instruction in a flipped learning environment, (2) to investigate the effects of students' English speaking ability after implementing the debate instruction in a flipped learning environment, (3) to investigate the effects of students' critical thinking skills after implementing debate instruction in a flipped learning environment, (4) and to investigate the students' opinion towards using debate instruction in a flipped learning environment. Twenty-four high school students in English programs in Bangkok were chosen as the sample group.

The findings revealed that 1) there was a significant improvement of the participants' English speaking ability after taking DIFLE, 2) there was a significant improvement of the participants' critical thinking skills after taking DIFLE, 3) the students had positive opinions towards debate instruction in a flipped learning environment. This research provides empirical evidence for the effectiveness of flipped learning environment and gives useful insights for future students, teachers, and institutions in teaching speaking English.

Field of Study: English as an   Student's Signature   ....
                  International Language   Advisor's Signature   ....
Academic Year: 2017

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จุฬาลงกรณ์มหาวิทยาลัย

CHULALONGKORN UNIVERSITY

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CHAPTER I
INTRODUCTION

1.1 Background of the Study

In face of the challenges prompting the new generation, skills in speaking ability and critical thinking has gained more recognition as essentials that educators must work to instill in their students. The Partnership for 21st Century Learning, a coalition between business community, education leaders, and policymaker in the United States, has also listed speaking ability and critical thinking skills as two of the most important skills needed in the near future. They stated that these skills are needed in preparing students for post-secondary education and the workforce (Voogt & Roblin, 2012).

In terms of post-secondary education, English speaking and critical thinking ability has become indispensable for students who wish to continue their higher education for many reasons. The first reason is that speaking ability is what students need for admission to universities. Standardize exams such as TOELF, IELTS, and CU-TEP have now all incorporated speaking in to its scoring criteria. With an increasing number of Thai university offering international programs, the probability of students using English for admission interviews and as functional language in their tertiary education is more likely.

Furthermore, the nationally standardized General Assessment Test (GAT) also involves assessing students' ability to identify relationships of concepts in a passage. These tasks are present in critical thinking skill which partly consists of conceptualizing, analyzing (Haase, 2010), and identifying arguments. Improvement in critical thinking therefore is necessary for students to enroll in Thai programs in general admission.

Secondly, proficiency in English speaking ability and critical thinking opened up possibilities of studying as an international student abroad, while the lack of ability in these areas hindered the efficiency of learning overseas. This means that even if they are admitted into university, they might not be successful in the chosen area. Studies have found that the problem of low speaking and critical thinking skills in students

create difficulties for Asian international students as they are unable to comprehend the course material conveyed through spoken language due to the prior educational experiences which prioritize grammar instead of conversational skills (Sawir, 2005). Students' lacking familiarity with spoken English, both for production (speaking) and reception (listening), could therefore result in difficulties in understanding lectures and taking notes (Choi, 1997; Wong, 2004) and academic performance in their chosen field of tertiary studies which is linguistically demanding (Brooks & Adams, 2002) and primarily uses spoken language.

Other studies have also revealed obstacles in Asian international student's learning approach when compared to their Western counterparts. A study showed that Asian international students are more likely to apply surface approach to learning (Ballard & Clanchy, 1997), an approach that puts emphasis on memorization and reproduction of the content rather than understanding the text, advancing their own arguments, and drawing conclusions (Donald & Jackling, 2007; Zhong, 2006). The study suggested that Asian international students lacked proper education in English speaking ability and critical thinking.

Thai high school students encounters similar obstacles with their Asian peers. Considering the limited literature available on Thai students' ability in critical thinking, the findings of ones that were available were far from satisfactory: A study done by Wang Jing in 2000 on student critical thinking in Higher Education Institution in northern Thailand reflected lower critical thinking ability compared to Chinese student. This might be attributed to the teaching method in Thailand that focused on transfer of knowledge rather than developing problem solving or critical thinking, and promoted rote learning than practice and training. As a result, Thai students are used to being obedient in learning (L. Subrahmanyan & Kisilevsky, 1988; Tripatara, 2001);

With the shortcomings of the student's English speaking ability and critical thinking skills, Thailand's traditional instructional methods in teaching English, such as the traditional classroom format are also deemed by many as rather ineffective. Kongkerd (2013) concedes that the current pedagogical approaches to English teaching in Thailand are unable to assist learners to become competent English users. It is further elaborated that the issue lies within the format of teaching, where the class is heavily teacher-oriented, which suggests that the classroom's pace, environment, and rules are

mainly dictated by the teacher, providing minimal opportunities for the student to interact with the teacher in class. Moreover, the lack of classroom activities or practical implementations of their communication skills inhibits their growth of English speaking ability, as a teacher-oriented classroom discourages the students to vocalize themselves in order to practice their English speaking ability (Peterson & Fennema, 1985). The English speaking ability of students under the traditional classroom format reflects negatively when compared to other countries. Multiple comparative statistics suggest that student's incompetency in English usage lies within the mismatch between the theoretical framework of teaching methods and actual implementation of such framework, leading to the unsatisfactory results of low English proficiency of Thai learners in comparison to that of students in other Southeast Asian countries (Deerojanawong, Prapphal, & Udomittipong, 2001; Khamkhien, 2011). Such unfavorable result has been consistent for a decade (2000 – 2010) under the traditional classroom format. Thus, it is often agreed by scholars that Thailand's teaching instructional format is inadequate (Khamkhien, 2011; Peterson & Fennema, 1985).

The lack of effective learning environment to enhance student's critical thinking and speaking ability does not only concern post-secondary students but also has practical implications for students that seeks to be in the workforce. The World Economic Forum has stated in its 2016 report on the future of job estimated that more than one third (36%) of jobs across all industry were expected to demand critical thinking skills. At the same time, demand for speaking skills in future jobs are expected to grow as well.

While the future of industries require that the new generation excel in 21st century skills, Thai high school students still lag behind. Various studies have shown that despite interaction with English at very young age in the primary level, secondary students were still incapable to effectively use English oral production (Khamkhien, 2011; Kitjaroonchai, 2012; Nuktong, 2010; Verapornvanichkul, 2011).

The situation in education would become more severe by the time student enter into workforces either immediately or in the future with the expected increase in competition in AEC. Despite the increasing regional demand for workers and the magnitude of change and room of opportunities, researches have concluded that Thai students still lack the necessary skills essential for their competitiveness in the

prospective market (Nguyen, 2014). One empirical study found that Thai employees were reluctant to assist English-speaking customers, and might even put their calls on hold (Saiyasombut & Voices, 2012), while another study reports failures of aviation industry to develop their employees' English mastery, resulting in a customer service delays and market losses (Wattanacharoensil & Yoopetch, 2012). Hence, enhancement of students' English speaking ability and critical thinking give them the edge in this competition while the lack of them, on the other hand, would mean lower chance for students' career opportunities.

The lack of critical thinking and speaking ability of Thai high school students could be attributed to the educational system, which fails to foster both skills. Part of this could be explained by the emphasis on standardized test that leave no space for critical thinking. The education system, nevertheless, reflects a larger perception of Thai society that values conformity than individuality. Therefore, students are taught to follow social norms rather than being critical or opposing to old ideas (Ramsden, 2003)

In an effort to enhance Thai student's speaking and critical thinking ability, this study used debate as a medium of instruction. Debate is an exchange of arguments whereby two opposing sides argue for different stance with reasons supporting their decision. Though there are academic debates organized in competitive setting, this study focuses on the use of debate as an instructional method to be used in classroom. Studies have shown that debate as an instructional method is effective in enhancing students' English speaking ability and critical thinking (Agustiawati, Petrus, & Sitinjak, 2015a; Alasmari & Ahmed, 2012; D Krieger, 2005; Tumposky, 2004; Zare & Othman, 2013). This study uses the Broad Participant Model (BPD), which is a debate model that uses fairly strict debate rules and dyadic debate structure for academic rigor while complemented with the role of debriefers to increase participation in the classroom.

It is hypothesized that debate is effective in enhancing student's English speaking ability because it is a complex task that requires students to perform interactive and extensive speaking, the two hardest tasks in Brown's oral production taxonomy, which starts from the process of delivering, answering to questions, and rebutting claims by the other side. These factors are closely related to the components of debate, which includes rebutting arguments, answering questions from the other side, and argument delivery. In addition, debate instruction is also expected to improve

students critical thinking because it engages students in multiple processes of recognition, manipulation, construction and evaluation of information and arguments. This is in line with vast amount of research that report positive relationship between debate and enhancement of students' critical thinking (D Krieger, 2005; Tumposky, 2004; Zare & Othman, 2013).

Despite many positive effects from debate instruction to the intellectual and linguistic development of students, one major problem remains to be resolved; its application in classroom setting proves to be very limited. This is due to the fact that critical thinking is inexorably linked to domain knowledge that is the subject on which students are expected to debate. While teaching students to think critically using debate instruction format is already a difficult and time-consuming task in itself because of certain vocabulary needed to proceed in debate context, instructor must also compartmentalize her class hour to give basic knowledge for students on the subject matter prior to the debate.

In order to overcome this limitation, this study explores the possibility of using flipped classroom to allow instructors to better manage their times to better apply debate as a class instructional strategy. Flipped classroom is a reversed version of the traditional classroom, where passive lectures in class hours are replaced with more interactive tasks to enhance students learning through actions (Bransford, Brophy, & Williams, 2000). Instead of having merit on its own, flipped classroom opens up a whole range of new possibilities for instructors to create more interactive class activities and to create more effective student engagement and learning environments (Bonwell & Eison, 1991)

As aforementioned, due to time-consuming nature of teaching students the fundamentals of critical thinking in debate, a traditional classroom format is highly time-restrictive. Thereby, when flipped classroom is used in conjunction with debate, it helps instructor use time in class more efficiently. Instructor can assign students with a task to watch clip videos on the week's debate topic and allow students to prepare their debate by themselves. Through flipped classroom environment, students can educate themselves at their own desired pace without being subjected to collective pace of traditional classrooms, which teachers are restricted by the class time given by the school, thus must teach at a certain pace, and such pace may not be suitable for all

students (Black, Harrison, Lee, Marshall, & Wiliam, 2004). Flipped classroom is especially efficient in this digital era, with multi-purpose smart-phones devices morphing into an essential part of people's life. In this respect, students are not solely restricted to in-class education, but, with smart-phones and other technological devices, students are able to gain access to online materials on a convenient basis regardless of their location.

In this study, upon the completion of the assigned video clips, students are tasked to answer certain online questions in relation to the information presented in the video clips. Such questions are designed for students to reflect what they have learnt, and potentially encourage them to generate new ideas before the commencement of the next class. In this regard, the preparation and reflection of study materials beforehand foster students' critical thinking skills, allowing them to develop self-analytical skills before engaging in activities in class, which would serve as a practical, effective student engagement environment (Herreid & Schiller, 2013)

As a solution to the problems aforementioned, this study provides a synthesis by using Debate Instruction through a Flipped Learning Environment, hereinafter referred to as DIFLE. It is the aim of this study, therefore, to inquire into the possibility of using debate and flipped classroom to improve Thai students' English speaking ability and critical thinking skill and which would help instructors better manage their instructional time and outside-of-class self-learning by students themselves. The needs of future demand for better critical thinking and English speaking ability of Thai high school students act as a ground which justifies this study to determine the effects of DIFLE.

1.2 Research Questions

1. Effects of Debate Instruction in Flipped Learning Environment on Thai High School Students

    1.1 What are the effects of Debate Instruction in Flipped Learning Environment on Thai High School Student's English speaking ability?

    1.2 What are the effects of Debate Instruction in Flipped Learning Environment on Thai High School Student's critical thinking?

2. What are the opinions of high school students towards learning debate using flipped classroom?

1.3 Research Objectives

    1.1 To study the effects of Debate Instruction in Flipped Learning Environment on Thai High School Student's speaking skills.

    1.2 To study the effects of Debate Instruction in Flipped Learning Environment on Thai High School Student's critical thinking skills.

    2. To study the opinions of high school student towards learning Debate Instruction in Flipped Learning Environment.

1.4 Statements of Hypotheses

    A study by Sanjva et al. (2014) in an Indonesian school, a Southeast Asian nation where context of teaching English as second language is very similar to Thailand, reported positive correlation with improved use of English language and complexity of content discussed as a consequence of the study using debate as an instructional method. Furthermore, the result of various study such as that done by Zare and Othman (2013) and Krieger (2005) also suggests that debate gives beneficial outcomes to students in the area of critical thinking skills as well as confidence. A study on flipped classroom by Strayer (2007) also states that its two components, consisting of computerized learning of material of outside of class and in-class activity, would ultimately create a learning environment that employs interactive activities inside of

class. Based on the results of previous studies, the hypotheses of the current study were set as the following:

1. After implementing Debate Instruction in Flipped Classroom, the posttest score of English speaking ability would increase from the pretest score at a significant level.

2. After implementing Debate Instruction Using Flipped Classroom, the posttest score of English critical thinking would increase from the pretest score at a significant level.

1.5 Scope of the Study

1.5.1. The population of this study was Thai high school students in grade 10 to 12 students who has at least 2 years of experience in formal education in an English Program or Bilingual Program. Such criteria were essential as the speaking skills emphasized in this study required an intermediate level command of English (Brown, 2004). The research was conducted on 24 students who enrolled in "Kev's Academy", an institute which offers language program.

1.5.2. The study consists of three variables. The independent variable was Debate Instruction in Flipped Learning Environment. The two dependent variables were student's English speaking ability and critical thinking skills.

1.5.3 The data were analyzed using the mixed method. The quantitative method was used to analyze the mean difference between pretest and posttest score and the 5-point Likert scale of opinion survey. The qualitative method was the content analysis of students' opinions expressed in open-ended answer in the questionnaire and the focus group.

1.6 Definition of Terms

1.6.1 Debate Instruction
Debate Instruction referred to an instructional method which uses debate as a format for structured argumentation between students in classroom setting as opposed to competitive debate. The activity required students to present conflicting positions and give reasons in support of the given stance.

In this study, *Debate Instruction* referred to the instruction method using the Board Participation Debate (BPD) model. In BPD, the class was organized into three parts: the predebate, delivery and postdebate phase. In the predebate phase, all students were required to do an independent research on a given topic to be debated. In the debate delivery phase, students who were assigned debater role were divided into two opposing sides to debate against each other's position on a determined topic. Other students who were not debating in the round were given debriefer role, requiring them to ask questions during debate and give critical review after the debate. In the postdebate phase, all students in the class participate in the postdebate discussion where arguments presented in the debate were examined, student's performance on English speaking ability and critical thinking were given by peers and the instructor, thus creating a feedback loop for the enhancement of students' performance in the area of English speaking ability and critical thinking. As debate sessions were held every third class, the first two classes were organized using active learning activities, forming one unit. The class activities vary, ranging from speaking and argumentation exercise with the purpose of improving students English speaking ability and critical thinking and, additionally, form better understanding of the debating topic.

1.6.2 Flipped Learning Environment

Flipped Learning Environment referred to a classroom that is inverted from the traditional classroom. In traditional learning environment, passive learning where teacher gives information to students in a one-way communication with minimal student participation, such as lectures, was done primarily in class hours, while active learning, such as homework, was done outside of classroom and without any supervision from class instructor. Flipped Learning Environment, on the other hand, swaps the nature of tasks inside and outside classroom. That is, passive learning was done outside classroom with the help of online learning technology, and active learning, such as role playing and debate, was done inside classroom, and with instructor's guidance.

In this study, Flipped Learning Environment referred to the structuring of teaching that allocate less active learning activities regarding debate and critical

thinking to time outside the classroom while making room for more active debate activity. The Flipped Learning Environment played a crucial role in the pre-debate phase of the debate sessions conducted in this study. Prior to a debate session, students were given a link to videos on Youtube to watch the introductory videos and an online lecture video. The introductory videos consisted of one or several videos regarding the topic of the upcoming debate which gave basic knowledge about the topic and the general positions taken considering the topic. For instance, if the debate topic was regarding the death penalty, the introductory videos provided basic explanation of what death penalty is, the controversies behind the topic, and the pros and cons of each side. The online lecture videos, on the other hand, were lectures on the principles of public speaking, presentation, debate and argumentation which were sequenced to follow the progress of DIFLE program. These videos focus more on the technicalities, rules, and strategies of debate. At the end of the videos, questions and guidelines were given to facilitates students their independent research on the topic. These questions may range from simply stating facts from the videos to open-ended questions that encourages students to state their opinion regarding the issue at hand.

1.6.3 Debate Instruction in Flipped Learning Environment

Accordingly, *Debate Instruction in Flipped Learning Environment* or *DIFLE* in this study referred to a 9-session teaching and learning process that situated Debate Instruction under the inverted class structure of Flipped Learning Environment, lasting over a span of 9 times plus 2 more times for pre and post test.

The 9 DIFLE sessions are divided in to 3 units, each consisting 3 sessions. Each session has three phases: the predebate phase, the debate delivery phase and the postdebate phase.The predebate phase includes the assigning of online materials and documents in relation to a certain lesson topic prior to the actual class to the students. This phase itself is a form of Flipped Classroom Environment, where students self-learn certain knowledge and skillset through online and digital means before the actual class. Furthermore, questions were asked regarding those online video, which allows for the teacher to evaluate the level of understanding of the students on those topics, and prepare the relevant focal point for the upcoming class.

In the debate delivery phase, the teacher would prepare handouts and in-class activities based on the pre-requisite that students have completed their tasks prior their attendance of the class. These activities, assisted through the teacher's lead and various type of handouts, include keywords identification, defining the motion, and flow of claim, and so on. For instance, students may be given several motions to define in class, and the way to define each motion depends on their prior understanding through online materials. In the DIFLE approach, instead of teaching the students how to define a motion in class, the teacher only assists the students in guiding them to define a motion. Furthermore, at the end of each unit, each students are expected to deliver a debate speech, to which they will have obtained such skills out-of-class and in class participation and learning. Finally, in the postdebate phase, the teacher leads a class discussion, where students critically evaluate each other in regards to their speech and the debate as a whole, while the teacher express his or her final opinion, and the reasons as to why one particular side has won the debate.

The instructor's role was crucial in leading the discussion, opening new perspectives and giving feedback to students as well as drawing links on the materials they have learnt online. Peers also gave feedback to other peers.

1.6.4 Speaking Ability

Speaking ability referred to the degree of proficiency which students is endowed to communicate orally in order to interact and exchange information with other people. It means the productive ability of students to give opinions and evidence supporting those ideas in a coherent and persuasive manner. In this study, the term *speaking ability* referred to the ability to use speaking microskills and macroskills (Brown, 2004). The speaking microskills evaluated by this study was the speaking fluency which referred to the ability of orally communicate with no or minimal hesitation and the correctness of pronunciation and intonation of words and sentences. The speaking macroskills in this study referred to the ability to employ speaking strategies such as the use of language tools (signposts and connectors) and the ability to show relationship between ideas through emphasis. The term speaking ability was used interchangeably with the term *oral communicative ability*.

Brown's list of speaking skills is subdivided into microskills, which includes student's ability to deal with smaller stretches of language, and macroskills including larger elements such as fluency, function and style.

1.6.5 Critical Thinking

Critical thinking, in this study, referred to the ability procession information through cognitive function such as inference, recognition of assumptions, deduction, interpretation, and evaluation of assumption (Bernard et al., 2008). It posited that critical thinking is a general skill that could be transferred across discipline but required sufficient background of the domain-knowledge. Therefore, debate provided opportunity to develop both critical thinking as a general skill and domain-specific knowledge. Each lecture video taught the general structure of critical thinking and required student to apply these thought structure to the debate topics in other units. The introductory videos, guiding questions, and independent research in the predebate phase had also been designed to ensure that students had sufficient knowledge in the subject under discussion.

This study, which aimed to study the effects of Debate Instruction in Flipped Learning Environment, must measure the Thai high school students' ability to perform tasks that require critical thinking skills. DIFLE used debate instruction which required students to engage in interactive and extensive speaking tasks, coupled with lessons in logic, argument analysis, evaluation, and synthesis given through online lecture videos as a mean to enhance students' critical thinking. Critical thinking skills were essential to the students in all three phases of each lesson. In the pre-debate phase, open-ended questions were given to allow room for students to further process what they have learnt through the video. During the debate delivery phase, class activities and debates promotes the use of critical thinking skills through argumentation construction and rebuttal formations. In the post-delivery phase, open-ended questions and discussions also requires student's critical thinking skills. To measure the effects of DIFLE on critical thinking ability of Thai high school student, the present study used Watson-Glaser Critical Thinking Appraisal, which was designed to test different aspects of

critical thinking, including inference, recognizing assumptions, deduction, interpretation, and evaluating assumptions, in the pretest and posttest.

1.6.6 High School Students

High school students in this research refer to a group of Thai high school students in grade 10 to 12 students who has at least 2 years of experience in formal education in an English Program or Bilingual Program. Such criteria was essential as the speaking skills emphasized in this study required an intermediate level command of English. (Brown 2004) The research was conducted on 24 students who enrolled in "Kev's Academy", an institute which offers language program.

1.6.7 Opinions toward DIFLE

Opinion towards DIFLE referred to students feeling after their experience in the 9-session DIFLE program. The opinions regarding aspects and components of DIFLE as an instructional method gave picture of DIFLE from the perspective of the learner. Students' opinions were quantified using 5-point Likert scale and were qualitative analyzed through content analyze using their answers in the open-ended opinion questionnaire and focus group.

The aspects of DIFLE on which the opinion focused was 1) the overall teaching of DIFLE, 2) the effects of DIFLE on critical thinking skills 3) the effect of DIFLE on English speaking ability 4) the predebate phase on independent research and teaching content, 5) the predebate phase on class activity, 6) the debate delivery phase, and 7) the postdebate phase.

This study focuses on the approach highlighted by Triandis (1977), Liaw (2007), and Jain and Kaur (2014), where student's opinion are divided into three components: affective, cognitive and behavioral components. Each of these components of opinion consist of positive or negative element.

The affective component is associated with the neural representation, which reflects the emotional, mood and feeling segment of an opinion, where the expression of emotions are surfaced and reacted upon external factors derived from an individual's values and belief. In other words, this type of affective-based opinion is utilized to

validate one's belief or values. In specific to this study, such component is categorized into positive or negative affectiveness. Positive affectiveness is the positive expression of opinion towards an external object, which includes, but not limited to, the expression of delight, love, and excitement. For instance, a positive affective opinion towards this study would be "I think the classroom environment is very friendly and engaging. It's not like we only come in and listen, but we want to be part of the classroom discussion as well. It was fun". Conversely, negative affectiveness includes, but not limited to, the dislike, disdain, hate, or anxiety towards an external object (Jain & Kaur, 2014; Liaw, 2007) or, in this respect, towards this study. A negative affective opinion towards this study includes "The preparation for debate can sometimes be stressful".

The cognitive component is associated and related to an individual's mental belief and disbelief about something and have towards an external object. In this regard, the cognitive component functions as a "storage" for individual to organize their processed information, whether short or long term. An example of the cognitive component would include, for example, a belief that the object of opinion hold value for that individual. Specific to this study, the cognitive component is categorized into positive and negative cognitive. Positive cognitive would consist of positive belief and evaluation towards this study. For example, a positive cognitive opinion is "debate would help me think of arguments and have my own opinions when faced with problems". Negative cognitive consist of negative belief and evaluation towards an external object (Liaw, 2007)

Behavioral component is the verbal and nonverbal behavioral tendency to do, not do, or intend to do something in regard to the object of that opinion. This component of attitude reflects the intention of a person leading to response tendencies and overt actions when exposed to an external object. This deduces that such behavioral responses and actions would likely show some degree of organizational structure or predictability (Wicker, 1969). Similar to affective and cognitive components, the behavioral component can be categorized into positive or negative behavior. Specific to this study, positive behavior would include favorable responses to do something regarding that external object, while negative behavior conveys the opposite, unfavorable responses to a certain external object (Triandis, 1977). For instance, a positive behavior opinion would be "The debates changed the way I spoke. Before I cannot even make it to a 1

minute speech. Now I can speak a lot more. I think it is because I feel more comfortable communicating with others and are better in expressing myself."

The understanding and evaluation of students' opinion toward the class, therefore, is critical to the holistic understanding of the course since opinion reveal students' opinion on the DIFLE.

CHAPTER II
LITERATURE REVIEW

Trends in education has moved towards a more rigorous 21st century that requires education to put learner in the center, thus promoting learning through practice. Teachers are expected to "Teach less" while making students "Learn more" from activities in class. In this study, debate, an activity in line with the learner-centered approach, is explored to see its possibility in enhancing students speaking ability and critical thinking, two skills essential to the 21st century learning.

In order to study the effect of the DIFLE in the enhancement of speaking ability and critical thinking of Thai high school students in classroom context, we must see the current and past dialogue regarding the teaching methods and its relation to the improvement of the target skill traits, as well as reviewing empirical studies of the effectiveness of the teaching instruction. The literature review starts off by examining speaking ability desirable as a study outcome, following by the use of debate as instructional tool for enhancing speaking ability. Furthermore, the study reviews previous findings on enhancement of student's critical thinking. As debate requires great amount of in-class active participations, it limits application of debate as an instructional method. Therefore, the use of flipped classroom approach to compensate for the limitation of debate which require great amount of classroom hour by allowing teachers to more appropriately balance the in-class and outside-of-class learning is also explored.

2.1 Speaking Ability

Speaking ability is an ability to orally communicate in order to interact and exchange information and ideas between interlocutors (Chaiyaphat, 2013). With the speaking ability, a speaker could clarify information, convey feelings, refer to objects, or recount events.

Brown (2004) has devised a taxonomy of oral production which categorizes speaking tasks into five types: imitative, intensive, responsive, interactive, and extensive (Brown, 2004). Each type is situated within the continuum of speaking

ability, with imitative speaking on the lowest end and extensive on the highest. *Imitative speaking* refers to the ability to merely imitate sounds, words, phrases or even sentences. The speaking task does not elicit the speaker's ability to comprehend the meaning of their oral production but focus on the phonetic level. *Intensive speaking* prompts students to produce short and expected stretches of language, with examples being sentence and dialogue completion and limited picture-cued tasks. *Responsive speaking* requires student to respond the language interaction at a limited length and choice of topics, and perhaps coupled with follow-up questions. *Interactive speaking* is different from responsive speaking in terms of complexity and length. The session might include multiple participants and cover multiple exchanges; for instance, interview and role play. Lastly, *Extensive speaking* refers to oral production which involves complex and relatively long monologues that require little verbal interaction. This includes formal delivery such as speech or oral presentation, and casual delivery such as story telling.

Brown also laid components of speaking skill would make up the criteria for assessment that teacher could use as objectives or desired outcomes. Brown's list of speaking skills is subdivided into microskills, which includes student's ability to deal with smaller stretches of language, and macroskills including larger elements such as fluency, function and style. The total of 16 objectives are as follow:

Microskills

1. Produce differences among English phonemes and allophonic variants.
2. Produce chunks of language of different lengths.
3. Produce English stress patterns, words in stressed and unstressed position, rhythmic structure, and intonation contours.
4. Produce reduced forms of words and phrases.
5. Use an adequate number of lexical units (words) to accomplish pragmatic purposes.
6. Produce fluent speech at different rates of delivery.
7. Monitor one's own oral production and use various strategic devices – pauses, fillers, self-corrections, backtracking – to enhance the clarity of the message.

8. Use grammatical word classes (nouns, verbs, etc.), systems (eg., tense, agreement, pluralization), word order, pattern, rules, elliptical forms.

9. Produce speech in natural constituents: in appropriate phrases, pause groups, breath groups, and sentence constituents.

10. Express a particular meaning in different grammatical forms.

11. Use cohesive devices in spoken discourse.

Macro skills

12. Appropriately accomplish communicative functions according to situations, participants, and goals.

13. Use appropriate styles, registers, implicature, redundancies, pragmatic conventions, conversation rules, floor-keeping and yielding, interruption and other sociolinguistic features in face-to-face conversations.

14. Convey links and connections between events and communicate such relations as focal and peripheral ideas, events and feelings, new information and given information, generalization and exemplification.

15. Convey facial features, kinesics, body language, and other nonverbal cues along with verbal language.

16. Develop and use a battery of speaking strategies, such as emphasizing key words, rephrasing, providing a context for interpreting the meaning of words, appealing for help, and accurately assessing how well your interlocutor is understanding you.

In order to assess students' linguistic ability once they perform a speaking task, the design of the task should include and use *one or several of these skills* as a checklist.

However, developing speaking ability does not prove to be a simple task as studies both at both national and international scale has presented challenges that hinders students' ability to improve their oral production. A study by Bruner et al. (2014) a hindrance to Thai students' English learning effectiveness due to the fact that conversations in role-plays engaged by students in the study lack authenticity as they are mostly scripted. The collectivist cultural norm also results in Thai students "often shied away from individual communicative tasks such as volunteering, asking and answering questions and expressing opinions for fear of 'losing face'." (A.

Subrahmanyan, 2013). The expectation revolving around speaking make oral skill become more of a challenge in the eyes for the students, as it may be perceived as a yardstick for which students measure their language proficiency (Baleghizadeh & Nasrollahi Shahri, 2014). Furthermore, speaking skill is intertwined with the speakers' capacity of vocabulary. Thus the lack of the learning techniques (AKIN & SEFEROĞLU, 2004), the complex processing entailed in speaking skill (Celce-Murcia, 2001), and the limited domain knowledge could pose problem when students engage in speaking.

In order to promote oral communicative capacity, the study nonetheless advices Thai students to become more autonomous in their learning and engage more in genuine, real-time communication tasks. (Bruner, Sinwongsuwat, & Radic-Bojanic, 2015). Additionally, to achieve higher proficiency in English speaking skill, students must be able to perform the more difficult tasks in Brown's taxonomy. Both of these improvements could be attained using *classroom debate*. In order to debate, students must exhibit their ability to give monologues for their speech delivery which is considered a major component of debate. This extensive speaking task is considered the highest speaking skills in Brown's taxonomy. Furthermore, there are times when students must ask and answer to other debaters' questions during his or her speech, an interactive task considered the second highest in Brown's speaking continuum. While exhibition of microskills in debate is important for making the speech comprehensible in terms of language ability, debate is distinctive in its improvement of macroskills. Students has to use language level appropriate to academic argumentation, and act according to rules of debate (social situations). They are also required to make connections between focal and peripheral ideas and couple them with nonverbal cues for persuasiveness. Browns' taxonomy is therefore helpful in putting debate in the context of speaking skill evaluation. Despite its collaborative nature, debate greatly promotes student's autonomy as students, in the end, are still required to make their line of arguments that makes sense for them personally. The proficiency in English language also interconnect with the ability to think critically about materials and issues at hand, as we shall discuss further in the review of critical thinking. The implication is that DIFLE might be more suitable for students who are already familiar with English speaking and grammatical use, hence the requirement that participants in the DIFLE

must have a background of at least 2 years in English or bilingual Program. The responsiveness required in refuting claims from opposing side also creates a genuine and real-time communication which would have positive effect on student's speaking ability.

2.1.1 Confidence and Speaking Ability

Confidence is an integral psychological factor that promotes and assists learner's oral speaking ability. Gurler (2015) emphasizes that among all other language skills, speaking is of an exclusive place to have effective communication and self-confidence is one of the facilitators to start the speech. There are several linkage between confidence and speaking ability in this respect.

First, self-confidence itself creates self-opportunity for the learners to willingly express their thoughts with minimal doubt or nervousness. Thus, once the learner is able to speak effectively and fluently, the learner's confidence will be further enhanced, leading the learner motivated to speak more, creating a build-up effect and direct correlation between self-confidence and speaking abilities (Prada Arango, 2015). Moreover, as confidence is such an imperative part that positively attributes to one's speaking ability, in fact, the absence or minimal presence of confidence is found to be one of the greatest barriers that affects the speaking ability of the learners (Jamila, 2014).

Second, such stance is further supported by other scholars, where they emphasize that among various personality aspects such as emotion, motivation, attitude, self-confidence, and anxiety, self-confidence is one of the most influential variables that affect speaking skills and foreign language learning (Prada Arango, 2015). This implies that self-confidence also indirectly stimulates the development of critical thinking, in such a way that self-confidence enables and motivates the learner to think critically towards a specific topic, and ultimately have the confidence to express the information that the learner wants to express. This, in turn, is essential in delivering speeches, where students are required to self-evaluate their arguments and express them in a clear and persuasive manner, to which having self-confidence is the main focal factor to the development of speaking abilities.

2.2 Debate

The term 'debate' could simply be defined as "a formal method of interactive and representational argument aimed at persuading judges and audience."(Alasmari & Ahmed, 2012). However, the term was used in various context, both outside and inside classroom or academia. It might be used in various settings which belong to different spheres such as personal, technical, and public (Trapp, Driscoll, & Zompetti, 2005). For the purpose of this study, the form of debate in discussion is one used in classroom setting with set off rules regulating productive argumentation among class members.

2.2.1 Debate instruction

Debate can come with different models depending on the purpose of the debate. Even though public debate used for political contexts are also qualified in the broad definition of debate, this study restricts its discussion to only debate organized for academic purposes. In academia, one of the model is to use debate as a competition that comes with different formats (eg. British Parliamentary (BP), Asian Parliamentary (AP), Policy Debate), having different teams debate to determine the winner. The other model is classroom debate employed by instructors as part of their curriculum or their main structure of the class activity (Oros, 2007). The models for different classroom debate models and format are shown in Table 1. The distinction of classroom debate from competitive debate is its flexibility and its educational purpose. Though this in no way implies that competitive debate is not educational, but rather that classroom debate lends itself to specifically optimize the learning opportunities for students. Furthermore, while competitive setting is determined by rigid rules and with the purpose of winning and losing debate, classroom debate, on the other hand, might borrow some of their rules to create variety for improving student's skills. Due to this flexibility of classroom debate, nevertheless, there are multiple formats of classroom debate for different learning purposes among which instructor has to select for her or his class.

2.2.2 Different Components and Models for Classroom Debate Instruction

Table 1: Comparison between three different models of classroom debate instruction

		SCDs	Pre-set Questions Debate	Whole Class Debate
Roles	Participants	- Debate team of 2 to 3 members	- Debate team of 2 to 5 members - Debriefers set case prior to debate by writing reports	- Whole class divided into opposing sides
	Instructor's Role	- Give questions and guiding structure - Moderate the debate when conversation is monopolized and may take caution in time keeping - Facilitate classroom discussion and debrief the process at the end of the debate.	- Gives questions and guiding structure - Moderates the debate when conversation is monopolized - Facilitate classroom discussion and debrief the process at the end of the debate.	- Moderates the debate when conversation is monopolized - Facilitate classroom discussion and debrief the process at the end of the debate.
Pre-debate	Topics	- Vary and incorporated into a course syllabus from the outset	-Vary; depending on instructor	- Vary; depending on instructor
	Positions	Dyadic	Dyadic	Two view points or more
	Preparation	- All students prepare both positive and negative points of the topic - Particular stance (affirmative or negative) is determined immediately before debate - At least one week for quality debate	- Students, or 'Debriefers' prepare case for debate by writing reports on debate topic and give questions to debaters - Debaters prepare for speech -Instructor gives questions and guiding structure in advance	- All students prepare both positive and negative points of the topic - Particular stance (affirmative or negative) is determined immediately before debate
Delivery	Rules	-Strict	-Fairly Strict	-Flexible
	Procedure	- Speeches alternate between two benches - Clear division of speakers' roles - Rigorous argumentation	- Debates answer pre-set questions from report writers -Speeches alternate between two benches -May allot definite time for cross-examination	- Teams randomly selected in class - Each student argues for their assigned position - Multiple students present their arguments in their round

		SCDs	Pre-set Questions Debate	Whole Class Debate
			- Debaters answer preset questions and may field new questions from report or other sides argument	
	Points of contact	- Rebuttals could be integrated into the debate - Discuss with the whole class after presentation	- Cross examination or - Discuss with the whole class after presentation	- Has specific round for rebuttals - Discuss with the whole class after presentation
Post-debate	Discussion	- Instructor facilitates an open forum for whole class discussion - Give immediate feedback in practice debates	- Instructor facilitates an open forum for whole class discussion - Debrifers provide oral critical review of the debate(s)	- Instructor facilitates an open forum for whole class discussion - Use class polling
	Evaluation	- Audience are given rubric to evaluate and the debate and inform debaters for improvement -Graded by instructor and - May couple with written assignments	- Audience are given rubric to evaluate and the debate and inform debaters for improvement - Find compromise position -Graded by instructor	- Vote, polling or more detailed evaluation could be used - Find compromise position

In all of the models, certain common components of debate can be found. In general, debate could be divided into three phases: pre-debate, delivery, and post-debate phase. Each phase prompts student to cooperate with their teammates in constructing arguments and counter-arguments against opposite team.

In pre-debate phase, students are given the debate motion and assigned benches or positions – affirmative, negative or multiple. Students then discuss the issues, assign different speaker roles, and set direction of the bench with their teammates. In this phase, topics and length of preparation time depend on agreement in class. Classroom debate might use various types of topics or ones related to the subject at hand depending on the purpose of the class and even assign debate topics in advance. Instructor might include pre-debate discussion and games in order to familiarize students to the debate

topic. This helps ensure the quality and general direction of the debate. Furthermore, while typical debate models are usually dyadic, that is representing only two opposing viewpoints (government/affirmative or opposition/negative), classroom debate is flexible to ideas more that two, such as Whole class debate (Northern Illinois University, n.d.).

Delivery phase includes the oral presentation of the ideas and is considered the main part of the session as students deliver their prepared arguments in support of their bench's stance. What differentiate debate from other types of public speaking, however, is that debaters are required to response to points made by the other sides by means for refutations, and pose questions through "points of contact". While listening to other debaters, individual debaters are might be allowed to also raise questions for clarifications. Delivery phase is sequenced so that the speech alternate between different sides for the purpose of creating an interactive flow of arguments until all debaters have spoken. As classroom debate is flexible in its use, instructor might allow for the use of quoted material and have multiple to no points of interaction depending on the skills instructor intend to advocate.

In the final phase of post-debate, competitive ends with adjudicators declaring a decision which team won the debate based on the persuasiveness of debaters' arguments reached by their logical justification. The importance of post-debate discussion lies in student's ability to explain the mental process that lead them to certain conclusions. The instructor must therefore spend time more on the reflection on the discussion of the topic. The reflection is crucial as it gives students deeper understanding of the topic as well as give feedbacks on students' performances. Both student's speaking skills and argumentation could be improved with evaluation by the instructor. It also an opportunity for the class to identify themselves from their position and retrospectively look at their positions to see things in a broader term. Post-debate might be used to discuss logical flaws found by either side of the debating parties or point out misinformed points. The topics of discussion might include, the quality of arguments used, other issues not considered in the debate, and changes students has in response to certain ideas. The whole class would benefit even if they are not immediately involved in the class's debate as they would be able to share ideas that

might differ from the two sides. This would eliminate two-sidedness problem Tumposky (2004) raised against debate.

Structured Classroom Debate (SCD) model is the strictest and most typical of all three in its structure of rules. Debaters are divided into two bench of two to three members. What differentiate SCD from other models is that it is the most encompassing, as it integrated into the curriculum of the course. It is preferable that debaters prepare both sides of the arguments and the instructor announce the side one the day of debate (Oros, 2007) in order to avoid "staged" debate which lacks the authenticity. The speeches are given alternate from bench to bench, creating an interactive dynamic in the debate. Because of its argumentative rigor, and some might be graded, instructor might organize ungraded practice rounds to improve students' ability. After the debate instructor opens up forum to invite other students not immediately involved in the week's debate to share different view points as well as broaden certain issues which were overlooked. Students and instructor might use same rubric to evaluate the performance of debaters and able to give feedbacks.

Pre-set Question model is very similar to SCD in terms of its structure. However, what make the two model different is that Pre-set question have students not immediately participating in the week's debate be 'debriefers'. Their roles are two folds: first is to set case or questions for the debate in class and requires prior research on the subject by the students themselves – hence the name "pre-set question"; second, they are to give oral analysis of the debate they witness in the post-debate process (Tessier, 2009). While the first affirmative speaker in SCD model set the case and the policy, Pre-set questions give this role to debriefers. This decreases the unpredictability of the debate. It also engages other students more because they must listen to the debate carefully in order to give post-debate oral critical analysis (Hall, 2011). At the post-debate phase, all class members might also use same evaluation criteria for the performance, and the discussion could be turned towards finding compromising solutions to the debate.

Lastly, Whole class debate is the most flexible of all three and is arguably the least intense. The instructor give topic to students prior to debates but all of them are asked to come up with arguments for both sides of the bench. Immediately before the debate, students are divided into half and are assigned a side. Students from different

bench could them be paired for the debate, or the whole class could participate. The speeches alternate between affirmative and negative side for 10 minutes each round and stop with a pause before moving into rebuttal rounds. Procedures of Whole class debate could be modified in various ways such as assigning more than two view points for students to defend. Postdebate phase might conclude with polling of students to see which line of argument is more persuasive and the discussion would focus on constructive arguments and finding compromise.

Regardless of different formats of debate, there are certain features in common which holds the value of debate. The first aspect of debate is collaborative as allows student to learn from each other. In the preparation process, students are invited to discuss and share information on the subject matter as well as their opinion. The diverse viewpoints mean student must be attentive to understand the message on communication. And by putting forward their own argument in their own language, students are constructing their own understanding of the concept at hand through communication with peers (Huryn, 1986). Second of all, debate is problem-based learning because it invites students to devise alternatives to solve social problems and argue in support of against those policies.

Both nature of debate is in line with the constructivist theory which believes that learning occurs when subject engage in a social interaction that is relevant to them and that allows them to construct knowledge related to there past in such a way that is personally meaningful (Hein, 1991). Another important aspect of debate is that it is not restricted to only one form of learning but engages learners with both cognitive and practical functions, both reflection and action which is consistent with Dewey's (1990) claim: "Here is the organic relation of theory and practice: the child not simply doing things, but getting also the *idea* of what he does; getting from the start some intellectual conception that enters into his practice and enriches it; while every idea finds, directly or indirectly, some application in experience and has some effect upon life. This, I need hardly say, fixes the position of the 'book' or reading in education. Harmful as a substitute for experience, it is all-important in interpreting and expanding experience." (Dewey, 2013).

2.2.3 The Broad Participants Debate Model

Since each models have its own unique-ness and limitation, This study seek to synthesize these models. This study used an adaptation of a model named Broad Particiapants Debate (BPD) which systhesizes particular components of all thee classroom debate models and enhances the inclusivity of debate and intensiveness of classroom discussion.

Table 2: Elements of Broad Participant Debate Format

		Broad Participant Debate
Roles	Participants	- Debate team of 3 members - Debriefers provide oral critical review of the debate(s)
	Instructor's Role	- Give guiding structure - Moderates the debate when conversation is monopolized and may take caution in time keeping - Facilitate classroom discussion and debrief the process at the end of the debate.
Pre-debate	Topics	- Vary; depending on instructor
	Positions	- Dyadic
	Preparation	- Uses flipped learning environment for preparation on the topic - All students prepare both positive and negative points of the topic - Determine debaters and their teams immediately before debate - Particular stance (affirmative or negative) is determined immediately before debate
Delivery	Rules	- Fairly Strict

	Procedure	- Teams randomly selected in class - Clear division of speakers' roles - Speeches alternate between two benches - Rigorous argumentation
	Points of contact	- Rebuttals could be integrated into the debate - Every student in the audience could ask questions through Point of Information's (POIs) - Discuss with the whole class after presentation
Post-debate	Discussion	- Assign Debriefer roles immediately after debates finishes - Debriefer provide oral critical review of the debate(s) - Use class polling - Instructor facilitates an open forum for whole class discussion
	Evaluation	- Audience are given rubric to evaluate and the debate and inform debaters for improvement - Find compromise position - Graded by instructor

In the predebate phase of Broad Participant Debate model, topics will be set by the instructor approximately one week prior to debate but specific questions will not be given. The dyadic debating teams of 3 students are determined immediately before the debate starts and time for preparation will be given briefly among team members.

As the name suggest, the reason for this to ensure greater level of participation from all students, thus broader range of particiants. As students do not know whether or not they will get to debate in this particular week, each student would have to be meticulous in their research on the topic, or else risk losing marks for poor performance. This model emphasises the seriousness of students doing their own research of on the topic because it propels studetns to find different and choose usable evidence after determine the credibility of the sources. The preparation of BPD model makes use of

flipped classroom in order to lay out general background of the topic that is easily comprehensible for students, priming them for further research on their own. Though this model makes use of debriefers from Pre-set Question model, their roles in setting the case and providing reports in preparational phase is cut as their job of setting the case would restrict the scope of debate and thus decrease participation of other student to engage in research, the diversity of information gathered in research and the creativity of debaters for proposing cases.

The delivery phase has strict rules and mainly borrows the format from SCDs model. Restricted to limited allotted time, speeches alternate between two opposing benches and engage with other side's argument through rebuttals integrated into each speaker's speech. Each speaker has clear division of their roles as part of contribution to the debate as a whole. The first speaker of the affirmative side, for example, is required to propose solutions to the problem at hand and may give serveral constructive arguments, while the first speaker of negative bench must give counter-argument to the proposed solution and give her or his own constructive arguements. Second speakers of both benches (in teams of three students) are expected to give rebuttals to the previous speaker and give constructive arguments in support of their own team. The last speakers, or the whip, are expected to give rebuttals and provide comparative analysis of the whole debate and frame it in favor of their own team. Unique to this model, students in the audience could participate in the debate by raising POIs and ask questions to the debater during her or his speech.

The reason for having such clear division is that it allows students to constantly see the overview of the debate and thus determine contribution by each individual speaker to the whole debate and so create a dynamic debate. This BPD uses the academic rigour in argumentation distinctive to SCD model, and lacking in other models, in order to enhance students critical thinking and interactive engagement between teams through integrated rebuttals. This forces student to develop autonomy in constructing their own speech and truely understand the topic without relying on peers in the delivery. Furthermore, by allowing students sitting in the audience to poses questions to debaters, this model engage all students in the debate thus raising the level of participation and the responsiveness required on the speaker.

The post debate phase of BPD, instructor then announce the names of students who would be debriefers for the previous debate. After some preparation time, they are required to give critical analysis of the debate they just witnessed and assess the validity of each side's arguments. It is necessary that debriefer give satisfactory level of logic as to how they arrive to such conclusion. However, students will not know in advance whether they will be a debriefer, thus they will have to actively focus on the debate and not only passively listen.

The reason for having a debriefer is to allows other students not immediately debating to participate in giving their reasons for finding one argument more convincing that the other. It is rather these rationales given by students that instructor must pay close attention for it shows the flaw in logic that lead students to make invalid arguments and is important to be mentioned in the open discussion. Instructor then opens forum for all opinions which may diverge from the ones put forth during debate and urges students to give compromise between the two sides. Borrowing from Whole class debate formant, after the discussion, the class may open to polling from all students to see general opinion as to which team succeed better in convincing the audience. The post-debate phase of classroom debate is very crucial to the development of critical thinking of students since all arguments are laid down for the comments and debaters get to learn what they did wrong in the debate.

This study adapts the Broad Participant Debate Model in an attempt to accentuate academically rigor as well as inclusivity found from each aforementioned models, and is designed to be consistent with the objective to enhance both student's critical thinking ability and help them achieve higher English speaking ability. However, the problem with the BPD model it that due to its strict rules inherent in SCD model, instructor must spend more time instructing students on the mind-set, rules and debating skills. When coupled with emphasis on inclusivity from participation of debriefer and audience, the guidance from instructor, and the complexity of the debate task itself, it necessarily means that classroom debate demands much more time in its explanatory functions and is almost impossible to fit all the activity in one class hour, with average of 50 minutes per class in Thai context. In order to execute the process effectively, the teacher needs great amount of time for class activities. The model proses

that the research of topic for students to do outside class through flipped classroom while debate activity is divided into two classes while assign.

2.2.4 Rubric for DIFLE

In light of the BPD model, expectations of debate revolves around criteria set prior to debate, hence a clear set of criteria is necessary for focused development objectives. Oros (2007) has suggested set of questions (Table 3) which could be used as criteria for evaluating student's performance both in term of argumentation (1,2, and 4) and rhetorical ability (3). These criteria could also be used to evaluate oral presentation and written argumentation. The criteria listed also encompasses Brown's (2004) macro skills regarding coherence of arguments and the interactive and extensive speaking task regarding the ability to deliver monologue and respond to interlocutor's message.

Table 3: Evaluation criteria for the oral debate component
- *Has the team provided clear, coherent arguments?*

- *Has the team met the burden of proof, based on course materials and/or outside research?*
  - *In other words, is adequate supporting evidence provided?*
- *Were presentations clear and persuasive?*
  - *Are the speakers easy to understand?*
  - *Do the speakers make eye contact with the audience?*
  - *Is the team's delivery both dynamic and effective?*
- *Effectiveness of argumentation and reasoning.*
  - *Were the arguments and counterarguments presented logically consistent?*
  - *Do the speakers find flaws or inconsistencies in their opponent's reasoning?*
  - *Is the team able to confront opposing arguments and rebuild their own case?*

> *Overall, teams should be graded not only on the content of their presentations but also on the clarity and persuasiveness of their presentations.*

All of the three components and criteria are present in and applicable to all three models of classroom debate. However, these criteria are not specific when it comes to evaluating students' level of performance observed in the classroom and they do not encompass the aspect of language usage manifested in the performance. Thus, the study must use evaluation in form of rubric which offers a more specific and qualitative assessment, and which encompass the aspect of student's language ability as well.

Evaluation form in Table 4 shows a rubric used in this study. It is an adaptation, and synthesis of the two existing rubrics used to evaluate critical thinking and student's language ability respectively. The former was offered by Winona State University to evaluate classroom debate, while the latter was *Speaking Rubric for Fluency Activities* offered by Pearson Education as an adaptation of O'malley and Pierce (1996) speaking assessment. For the purpose of this study's objectives, the synthesized primary rubric differentiates the categories into traits of critical thinking and speaking ability. This is the first design before being adapted against the criteria of target skills enhancement.

Table 4: Primary Rubric for evaluation of student's performance in critical thinking and speaking skills during delivery phase

	5	4	3	2	1
Predebate Research Skills					
1.1)Understanding and Additional Research	Student understands the issue at a profound level and did additional research.	Student under the issue at a moderate level and did few additional research.	Student understands the basic information of the issue but did not do any additional research.	Student has misunderstanding of issues and did not do any additional research.	Students has complete misunderstanding of the issues and did not do any additional research.
Critical Thinking					
2.1)Case Construction	The problems and motion were clearly, thoroughly, and fairly defined and are consistent with proposed solution/counter-model.	The problems and motion were sufficiently and fairly defined and are consistent with proposed solution/counter-model.	The problems and motion were minimally and fairly defined, and are consistent with proposed solution/counter-model.	The problems and motion were vaguely and defined, and is slightly consistent with proposed solution/counter-model.	The problems and solution/counter-model were not, or unfairly, defined and are not consistent with solution/counter-model.
2.2)Argument Construction	All arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.	Most arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.	All arguments were clearly tied to an idea (premise) but the organized was sometimes not clear or logical.	Arguments were not tied well in an idea.	Arguments were not tied to an idea at all.
2.3)Refutation	All counter-arguments were accurate, relevant and strong.	Most counter-arguments were accurate, relevant and strong.	Most counter-arguments were accurate, relevant, but several were weak.	Some counter arguments were weak and irrelevant.	Counter-arguments were not accurate and/or relevant.
2.4)Use of Information	All information presented in this debate was clear,	Most information presented in this debate was clear,	Most information presented in this debate was clear and accurate,	Some information presented was accurate, but there were some	Information has some major inaccuracies OR was

	5	4	3	2	1
	accurate and relevant.	accurate and relevant.	but not usually relevant.	minor inaccuracies.	usually not clear.
Speaking Ability					
3.1)Speaking Fluency	Speaks smoothly, and communicates without hesitation; Pronunciation and intonation are always very clear/accurate.	Speaks smoothly, with little hesitation that does not interfere with communication; Pronunciation and intonation are almost always very clear/accurate.	Speaks with some hesitation, but it does not usually interfere with communication; Pronunciation and intonation are usually clear/accurate with a few problem areas.	Speaks with some hesitation, which often interferes with communication; Pronunciation and intonation errors sometimes make it difficult to understand the student	Hesitates too often when speaking, which often interferes with communication; Frequent problems with pronunciation and intonation
3.2)Speaking Strategies	Employment of speaking strategies such as signposts, connectors and paraphrasing were pervasive; Student was able to clearly emphasize ideas and their relations.	Employment of speaking strategies such as signposts, connectors and paraphrasing were frequently; Student was able to emphasize ideas and their relations.	Employment of speaking strategies such as signposts, connectors and paraphrasing were occasional; Ideas and their relations were sometimes clearly presented	Employment of speaking strategies such as signposts, connectors and paraphrasing were scare; Ideas and their relations were unclearly presented	Employment of speaking strategies such as signposts, connectors and paraphrasing were non-existent; Ideas and their relations could not be distinguished.

Speaking skills are categorized into speaking fluency and speaking strategy, which parallels Brown's (2004) categorization of micro and macro skills. In this case, micro skills relates to speaking fluency, which referred to the ability of orally communicate with no minimal hesitation and the correctness of pronunciation and intonation of words and sentences. This definition connects to the two sub-elements of speaking fluency, namely, speech flow and pronunciation and intonation, which are related to the proficiency in communication and pronunciation. Such a definition of

speaking fluency parallels to Brown's (2004) item of micro skills, which are (i) producing fluent speech at different rates of delivery, and (ii) produce English stress patterns, words in stressed and unstressed position, rhythmic structure, and intonation contours. Conversely, macro skills refers to the ability to employ speaking strategies such as the use of language tools and the ability to show relationship between ideas through emphasis. This directly connects with the element of speaking strategies of the DIFLE rubric, to which the two sub-elements of speaking strategies (use of signposts, emphasis of idea) depicts and parallels the definition of macro skills established by Brown (2004). In this case, Brown's (2004) macro skills item that are related to speaking strategies are (i) appropriately accomplish communicative functions in academic settings, including proper level of words, (ii) conveying links and connection between events and communicate such relations as focal and peripheral ideas, events and feelings, new information and given information, generalization and exemplification, and (iii) developing and using a battery of speaking strategies, such as emphasizing key words, rephrasing, providing a context for interpreting the meaning of words.

The critical thinking part uses Information, Rebuttals, Uses of Facts/Statistics, Organization, and Understanding of Topic as criteria to evaluate the student's critical thinking ability. The element of case construction of the DIFLE rubric assesses the students' ability to clearly, relevantly and accurately present the information in the debate. This element relates to *recognize assumptions* of the RED Model, which conveys the students' ability to distinguish between fact and opinion, and the ability to notice and question the information presented in front, and not assume such information immediately upon receipt. In this respect, a satisfactory case construction requires the student to clearly define the problems and motions and tie consistently with the proposed solution, and requires them to draw a conclusion or solution that logically flows with the supporting argument and evidence that they have presented. Thus, the ability for the student to distinguish between fact and opinion and not assume the information upon receipt is an integral part for the student to construct a proper case, as they are required to select related facts and information in order to construct a strong and persuasive case.

Furthermore, the elements of argument construction and refutations under the DIFLE rubric relates to *evaluate argument* of the RED Model. Evaluate argument describes the ability to analyze the given information and argument objectively, which involves the constant questioning of the legitimacy of the supporting authorities and evidence. This ultimately relates to argument construction, as students will need to demonstrate the ability to clearly tie their arguments to a premise, which involves the ability to analyze the arguments thoroughly before they can tie such argument to the premise. Moreover, the element of refutation also parallels evaluate argument, as refutation requires counter-arguments that are accurate, relevant and strong. This conveys that the students must possess the ability to evaluate the arguments of the opposition side thoroughly, question their basis of authority, before the student could form a sound refutation.

Lastly, *drawing conclusion* of the RED Model, which depicts the individual's ability to bring various different information together and arrive at a conclusion that logically flows with all the given evidence, relates to the element of use of information in critical thinking of the DIFLE Rubric. Use of information assess the student's ability to present information in a debate that is clear, accurate and relevant. In this respect, in order to present information in a clear and accurate manner, it requires the students to put various different information together and formulate a conclusion that logically flows with all the given evidence to present a clear picture of the student's case. Thus, the elements of critical thinking skills ultimately relate to the three factors of the RED Model.

2.2.5 Effects of Debate on Speaking Ability

Debate is particularly useful in development of speaking skill as it requires debaters to perform the two tasks at the highest end of oral production, that is *interactive and extensive speaking*. The delivery phase of the debate requires student to individually give speech (with limited preparation time), consequently prompting students to orally present their ideas to other participants. In order for their speech to be logical and comprehensible, student must provide explanations, giving examples, where both micro- and macroskills proposed by Brown (2004) are exercised. Not only

using correct grammar and pronunciation, debaters would have to show links between arguments, emphasize points, and give set of information in support of their ideas. Looking in terms of Brown's macroskills, the debate develops student ability to organize their debates for better comprehension. Furthermore, academic jargons with which students would have to familiarize has its usage beyond strict debate format since it could become a framework for argumentation in other context. This is consistent with Piaget's (1971) view that learning does not occur as a result of mere copies of idea, but rather when person acts on those ideas. Learning occurs once a person has developed as systems of alternatives to actively transform the object of their thought. Debate also let students exercise a whole range of language functions which Chamot and O'Malley stated are needed in all content areas include: explaining, informing, justifying, debating, describing, classifying, proving, persuading, and evaluating (Alasmari & Ahmed, 2012; Chamot; O'malley & Pierce, 1996).

In debate students engage in interactive speaking during the preparation phase and performance phase where they must refute the claims made by previous speakers, and respond to POIs (questions posed by opposite side during speech). Discussions with team members during preparation requires transactional and interactional exchange in that they have to share their opinions and possible stances while at the same time invite their teammates to openly share ideas. Once on the podium, students are expected to answer unprepared questions posed by opposite bench, compelling speaker to give impromptu answers that is coherent with their team members' previous speeches. Furthermore, in such interactive tasks, not only the productive but also the receptive skill of student was used as they would have to first understand the argument of other students before refuting the claim. As Somjai (2015) put it, "in speaking, people put ideas into words and talk about perceptions they want other people to grasp" (p.3). As such, communication should be perceived as a collaborative achievement in which interlocutors engage to negotiate meaning (Sari, 2012).

Several empirical studies have reported significant improvement in students' English speaking skill and vocabulary after applying debate in their class activity (Agustiawati, Petrus, & Sitinjak, 2015b) while another study also encompasses other skill areas such as grammar, and comprehension (Sanjaya, Nurweni, & Hasan, 2014). A study conducted in Japan by Fukuda (2003) shows that after using debate, number of

students who were not afraid to express their perspective rose from 30.8 to 56.7 per cent. He also noted that the knowledge and practice also led student to be more accustomed to the expression of ideas. Apart from improved ability in command target language and critical thinking, debate also affects the attitude of students, rendering them more confident in their expression of opinions.

2.3 Critical Thinking

Even though it is generally accepted that critical thinking a form of thinking necessary in various field, the clear consensus on the definition of the term, and what it encompasses, is still being debated among educationalists. McPeck (1981) has defined the term as "reflective skepticism", while Ennis (1992) referred to it as "reasonable, reflective thinking that is focused on what to believe or do" (Ennis, 1985). Taking societal aspect into the mix, Benesch describe critical thinking as "a democratic learning process examining power relations and social inequities" (Benesch, 1993). Other scholars think of critical thinking as a tool and method, therefore concerns themselves with the entire scheme of processing, evaluating, and creating information. Citing Scriven and Paul (2001), Haase (2010) uses definition that "critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action." However, all of these terms gives us an overall direction of critical thinking as related to procession of information. In the broadest sense, critical thinking therefore could be defined as "a tool with certain components to handle information..." which "...involves a particular way in which information is treated" (Haase, 2010).

The features of critical thinking could be identified by its function in processing information: ranging from conceptualizing, applying, analysing, synthesizing, and evaluating information. In a similar sense, Dick (1991) has provided An Empirical Taxonomy of Critical Thinking as follow: 1) Identifying arguments, including themes, conclusions, reasons, organization; 2) analyzing arguments, including assumptions, vagueness, omissions; 3) considering external influences, including values, authority,

emotional language; 4) scientific analytic reasoning, including causality, statistical reasoning; and 5) reasoning and logic, including analogy, deduction, induction. Transforming these abstract and vague categories of critical thinking into a more actionable tasks, Fisher (2001) mentioned **some** of various fundamental skills critical thinking, which involve tasks to:

1. identify the elements in a reasoned case, especially reasons and conclusions;
2. identify and evaluate assumptions;
3. clarify and interpret expressions and ideas;
4. judge the acceptability, especially the credibility, of claims;
5. evaluate arguments of different kinds;
6. analyse, evaluate and produce explanations;
7. analyse, evaluate and make decisions;
8. draw inferences;
9. produce arguments.

With all the elements of debate activity considered, one could say that debate is an explicit manifestation, if not the epitome, of the practice of critical thinking in real-life. Each part of debate involves fulfillments of tasks fundamental to critical thinking laid down by these thinkers. In the *predebate phase*, students are required to do research on the topic, form arguments, and evaluate the sources of their evidence. Through these processes, student learn to think critically by identifying the elements in a reasoned case (Fisher's 1st task), identifying and evaluating assumptions (2nd task), interpreting expressions and ideas (part of 3rd task), evaluating arguments of different kinds (5th task), analysing, evaluating and produce explanations (6th task), drawing inferences (8th task), and producing arguments (9th task).

In the *delivery phase* which is arguably the main part of debate, students also need to perform tasks all of Fisher's task, but specifically on certain tasks such as identify the elements in a reasoned case (1st task), clarifying and interpreting assumptions (3rd task), judging the acceptability, especially the credibility of claims (4th task), analysing, evaluating and producing explanations (6th task), analysing, evaluating and making decisions (7th task), and producing arguments (9th task).

In the final phase on *postdebate discussion*, the activity focuses mainly on the evaluative skills, including the tasks to evaluate assumptions, judge the acceptability of claims, analyse, evaluate and make decisions, and produce arguments.

On the other hand, markedly more comprehensive than Fisher's, Diane Halpern (1994) also proposed another way to categorize critical thinking skills for collage level as follows:

Table 5: Halpern's Categorization of College-Level Critical Thinking Skills
         Categorization of College-Level Critical Thinking Skills

1. Verbal Reasoning Skills

     a. recognizing and defending against the inappropriate use of emotional and misleading language (e.g., labeling, name calling, ambiguity, vagueness, hedging, euphemism, bureaucratese, and arguments by etymology [original word use]);

     b. detecting the misuse of definitions and reification;

     c. understanding the use of framing with leading questions, negation, and marked words to bias the reader;

     d. using analogies appropriately, which includes examining the nature of the similarity relationship and its connection to the conclusion;

     e. employing questioning and paraphrase as a skill for comprehension of text and oral language (i.e., recognizing main ideas);

     f. producing and using a graphic representation of information provided in prose form

2. Argument Analysis Skills

     a. identifying premises (reasons), counterarguments, and conclusions;

     b. reasoning with "if, then" statements (which includes avoiding the fallacies of affirming the consequence and denying the antecedents);

     c. judging the credibility of an information source;

     d. judging the consistency, relevance to the conclusion, and adequacy of the way premises support a conclusion;

     e. understanding the differences among opinion, reasoned judgment, and fact;

    f. recognizing and avoiding common fallacies such as straw person, appeals to ignorance, slippery slope, false dichotomy, guilt by association, and arguments against the person.

3. Skills in Thinking As Hypothesis Testing

    a. recognizing the need for and using operational definitions;

    b. understanding the need to isolate and control variables in order to make strong causal claims;

    c. checking for adequate sample size and possible bias in sampling when a generalization is made;

    d. being able to describe the relationship between any two variables as positive, negative, or unrelated;

    e. understanding the limits of correlation reasoning;

    f. seeking converging evidence to increase confidence in a conclusion;

    g. considering the relative "badness" of different sorts of errors;

    h. solving problems with proportional and combinational (systematic combinations) reasoning;

    i. determining how self-fulfilling prophecies could be responsible for experimental results and everyday observations.

4. Using Likelihood and Uncertainty

    a. recognizing regression to the mean;

    b. understanding and avoiding conjunction errors;

    c. utilizing base rates to make predictions;

    d. understanding the limits of extrapolation;

    e. adjusting risk assessments to account for the cumulative nature of probabilistic events.

5. Decision-Making and Problem-Solving Skills

    a. listing alternatives and considering the pros and cons of each;

    b. restating the problem to consider different sorts of alternatives;

    c. recognizing the bias in hindsight analyses;

    d. seeking information to reduce uncertainty;

e. recognizing decisions based on entrapment;

f. producing graphs, diagrams, hierarchical trees, matrices, and models as solutions [*sic*] aids;

g. understanding how world views can constrain the problem-solving process;

h. using numerous strategies in solving problems including means-ends analysis, working backward, simplification, analogies, brainstorming, contradiction, and trial and error.

The list of skills proposed by Halpern came very close to being comprehensive that an instructor who wants to improve students critical thinking would have to choose only part of it. However, despite the extend of the list, where some of skills could be found only Fisher's, Halpern's skills list still lacks a set of skills that involves the synthesis of information to create new arguments. This should not be equated to decision-making and problem-solving skills categorized by Halpern since some arguments may not be made to decide on a certain issue or solve any problem in particular. Therefore, only selecting one of Halpern's set of skills is still inadequate for this research.

The aim of critical thinking development might be to enable students to do all the aforementioned tasks. However, to do well in critical thinking does not depend solely on the ability to analyse, evaluate, or synthesise arguments. Ability in critical thinking is close related to the language proficiency as it thoughts are shaped and conveyed through language use. A study on Malaysian undergraduate students done by Rashid and Hashim (Rashid & Hashim, 2008) found a significant correlation between the students English proficiency and critical thinking. Though a superior-level of language use is insufficient to imply high-level critical thinking, evidence suggest that higher critical thinking skills require a proportionally higher level of language proficiency since the two skills "feed on each other"(Brumfit, Myles, Mitchell, Johnston, & Ford, 2005). This clearly has pedagogical implications in two main ways. First, instructor must devise a course that proportionately balance the development of language skills and critical thinking ability, such that harder critical thinking task is presented to the student once their language proficiency is sufficient to critically engage

with the material. Second, and conversely, it means that in devising a course on critical thinking which require a higher level of language proficiency might be suitable only for students who already are already familiar with the target language. Therefore, the study of critical thinking in DIFLE course should make requirements for minimum language proficiency of participants.

A debate of critical thinking, however, is that there is a different between local and general critical thinking which need to be distinguished from one another.

Critical thinking that is considered ideal are mostly *general critical thinking*, an idea which usually portrayed critical thinking as being interdisciplinary framework (Duron, Limbach, & Waugh, 2006). Advocate of general critical thinking believes that the principle of critical thinking could be applied to different debate subjects without great expertise on the subject. On the other hand, other thinkers believe in *local critical thinking*, that is a critical thinking that is area-specific and require domain-knowledge. Some studies (Friedler, Nachmias, & Linn, 1990; Koslowski, 1996; Willingham, 2007) suggest that critical thinking is intrinsically tied to domain-knowledge and thus limiting critical thinking in the field with which the learner was not familiar. For example, a critical thinker can engage productively in debate over scientific issue at a deep level can only be achieved by those who has specific knowledge in the field, or even subfield, of the issues in debate. Critical thinking is determined also be thinker's cultural upbringing, prior beliefs, and familiarity with subject which allows the thinker to evaluate the plausibility, factors and hypotheses and point out anomalies (Chen, Mo, & Honomichl, 2004).

This research is based on the assumption that both sides of the argument on critical thinking are at least partially true. Although the high school debates could not reach the depth of those among experts, there are meta-cognitive tasks that could be applied to different issues regardless of the expertise. There are evidences that report transferability of critical thinking from one domain to another, though depending on the how the meta-cognitive tasks are taught (Halpern, 1994; Kennedy, Fisher, & Ennis, 1991; Nickerson, 1988). For educational purpose, the debate on general and local critical thinking should remind us about the necessity for both the understanding of the topic and the meta-cognitive skills in when students learn to think critically.

As a result, this study used the Pearson's Watson Glaser Critical Thinking Appraisal's (Chartrand, Ishikawa, & Flander, 2013) "RED Model", a model that provides a synthesis of this study's desired critical thinking components. As one of the most widely-used assessment model of critical thinking, it divided critical thinking into three components: recognize assumptions, evaluate arguments and draw conclusions. Various points in the aforementioned factors parallels with Fisher's (2001) and Diane Halpern's (1994) categorization of critical thinking skills.

Firstly, the factor of "recognize assumption" conveys one's ability to distinguish between fact and opinion. This implies the ability to notice and question the information presented in front, and not assume such information immediately upon receipt. Thus, when assumptions are questioned with different perspective by different people, the information will, in itself, be viewed in a richer perspective. Some of Fisher's (2001) list of fundamental critical thinking skills mirrors "recognize assumptions", for instance, the task to "identify and evaluate assumptions".

Secondly, the factor of "evaluate arguments" describes the ability to analyze the given information and argument objectively, which involves the constant questioning of the legitimacy of the supporting authorities and evidence, as well as the awareness of how emotions may influence the information. The main obstacle to this factor would involve personal bias, where one's perspective or emotions may cloud their evaluation of an argument. Thus, remaining objective is the key to drawing more accurate conclusions. In this respect, Fisher's (2001) list of fundamental critical thinking skills, including "judge the acceptability, especially the credibility, of claims" and "evaluate arguments of different kinds" provides for sharp similarities between the RED model and Fisher's (2001) list. Furthermore, under "Argument Analysis Skills" in Diane Halpern's (1994) categorization of critical thinking skill consist of "judging the credibility of an information source" also clearly mirrors that of the "evaluate arguments" of the RED Model.

Lastly, the factor of "drawing conclusions" depicts an individual's ability to bring various different information together and arrive at a conclusion in such a way that it logically flows with all the given evidence, and does not misdirect the conclusions beyond what is presented in the evidence. Thus, a good conclusion is normally described as "good judgment", as they generally arrive at a quality decision.

Such factor mirrors that of Fisher's (2001) "draw inference", " identify the elements in a reasoned case, especially reasons and conclusions" and Diane Halpern's (1994) list which states "seeking converging evidence to increase confidence in a conclusion". Both of these studies echoes the factor of "drawing conclusions" of the RED Model.

The "RED" Model is an updated version of the previous model of Watson Glaser, which had 5 elements: Inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments. The updated version synthesized the 5 elements in to the 3 elements aforementioned above.

As high school students do no need to develop a specialized knowledge in any field but rather a skill that can be applied to various field or specialization in their future education, the aim of this study is primarily to develop general critical thinking in high school students rather that local critical thinking. Therefore, it focuses with the process of recognizing, evaluating, and drawing conclusions in arguments while giving only basic information enough for a productive debate. Moreover, due to the limited amount of class hour, teacher have to choose between giving students the domain knowledge or the class activity. Doing both would be impossible for the teacher to manage.

2.3.1 Effects of Debate on Critical Thinking

Debate also lead to improvement in ability of critical thinking which are the capabilities to reflect, make judgment and decision on the reliability of the information and the preferable course of actions during problem-solving and reasoning. This is crucial to student to make rational decisions and make fallacies presented in arguments that determines the persuasiveness of their English communication. Furthermore, according to Tumposky (2004), debate is a tool of learning has at least three linkages to critical thinking. First, it moves learning from lecture to peer interaction. In this two-way communication, instead of passively take information from lecturer, students are invited to gain deeper understanding of the material through their critical discussion with peers. This corresponds to constructivist proposition that effective learning must be done through social interaction which allows learners to construct knowledge with higher-order cognitive functions. Second, debate develops metacognition, an aspect of critical thinking which concerned learner's awareness of their own thinking process.

As Trumposky puts it: "The analysis of both sides of an argument, which is developed in the debate format, encourages participants to step outside their personal frames of reference and become aware of their own thinking, if only to anticipate how such thinking might be vulnerable to attack from an opponent." As a result, this shift of point of view could lead to empathy for other side.

As research have shown that debate yield many benefits to student in the areas of English as second language and critical thinking, the use of debate as an in-class activity is advocated in various educational strategies (Zare & Othman, 2013). In general, they suggest that classroom debate acts as a systematic instructional strategy which has the potential to engage students in active learning, promotes critical thinking skills, give deeper understanding of course content, and improves speaking abilities. Regarding learning a foreign language in particular, Krieger (2005), for example, reported that debate is helpful because it "engages students in a variety of cognitive and linguistic ways" (p.1). In addition, various empirical studies have given recommendations on ways teachers could employ for an improvement in student's performance in general which is consistent with conduct of debate. Studies by Cheong and Cheong (2008) and Yang and Wu (2012), for instance, have suggested that students have time to think on the problem solving tasks and to discuss on the problem with group members. Other studies have suggested that having different group of students share ideas to the whole class (Y.-T. C. Yang & Wu, 2012) and have teacher explain the answers and guide students to reflect on the problem (Kim, Sharma, Land, & Furlong, 2013; S. C. Yang & Chung, 2009) showed positive effects.

The context study by Sanjaya et al. (2014) has conducted is of particular interest to us as it is conducted in Indonesia, where there contain certain cultural similarities in the mainstream teaching of English as Foreign Language in Thailand. The researcher has presented limitations that student might not be comfortable in front of researcher/evaluator. There is a classroom culture of using first language as primary learning tool instead of target language and main learning mode is in written form through text books. And even in this context, nonetheless, the use of debate as class activity has proven to be effective. Using Asian Parliamentary Debate style also yield similar result, the study has reported a gradually increased confident and enthusiasm of student to participate in debate activity. Furthermore, the report shows that "the order

of the debate was also getting better and the students were more confident so that they spoke English more systematic and fluent. On top of that, the topic that discussed by the students was more complex meaning that the students' vocabulary achievement improved." (Sanjaya et al., 2014)

On the other hand, far from being a perfect tool for active-learning class activity, research shows that students do not reap benefit from class debate equally. Some students suggest the activity creates anxiety and stress while others reported that the activity has failed to either improve their understanding of the issue at hand or practice their critical thinking skills (Omelicheva, 2007). Moreover, some students criticized that debate activity take away time for instructor to discuss the assigned reading (Oros, 2007). This might arise as a result that different students are comfortable with different styles of learning. Factors such as personal preference, gender or cultural background comes into play when one prefer certain pedagogy (Belenky, Clinchy, Goldberger, & Tarule, 1986; Gay, 2010; Tannen, 1992). Some therefore are more comfortable with harmonious styles of inquiry than that of confrontational pedagogies. Debate also face criticisms as a result of its inherent nature. First, debate might lead to dualist mentality as it promotes dichotomies of positions represented in the debate format. Thus, "Debate can oversimplify and misrepresent the nature of knowledge,"(Tumposky, 2004). It in turn "ignores the multiplicity of perspectives inherent in many issues" which is necessary for finding the best solution for the complex problem but might not make the argument stronger or the advocate "win" the debate. The problems then come to procedural ones as well. Some research is reported that negative experience may arise from the quality of the motions used which sometimes might be poorly-formulated and favor one side. Others recounts problems of the debate becoming muddled and at times digress (Goodwin, 2003).

According to researches and surveys, it is also note-worthy to emphasize that critical thinking skills developed through general class discussion and debate exposures demands and enhances oral communication and speaking skills of students. Several psychological professors conducted a research class study at California State College, in which they organized debate classes in order to expose students to both sides of the issues, where the professors concluded that "debate forced them to re-read and re-think both their own and the opposing position more intensely than is necessary to repeat

lecture materials" (Giacquinta, Bauer, & Levin, 1993). Then, another survey conducted research from 286 participants of competitive debate teams at 70 different universities, which they have concluded that the students, already possessing prior critical thinking skills through past debate experiences, have substantially improved their oral communication skills through intense debate competitions through their utilization of critical thinking skills, and thereby has enhanced their oral communication skills (Kennedy et al., 1991).

Researcher, nonetheless, suggest that these limitations could be resolved by having instructor giving "take away points" and address issues in the debate during the post-debate discussion and reflection (Oros, 2007). Also, good planning and communication between teacher and leaner of the rationale for the debate format and activity in general could help the class gain more benefit from debate. In order for the debate as a format of learning activity to yield its maximal benefit, the aforementioned limitations and issues of debate as classroom practice must be addressed. Its depends how the format might need to be studied and revised to better suit classroom context instead of format used in competitions.

The problem of teacher's time allocation could be solved by the use of flipped classroom approach as it will open up possibility for teachers to manage active class learning while not overlooking the domain knowledge. Instead of using classroom hour to give lecture on contents that students could find and learn by themselves online, teach could use that time to let student debate on the issues. As Trilling and Fadel (2009) suggest, "Learning technologies are also freeing up time to focus on the 21st century skills that require more interaction among learners while providing tools to further their skill-building online—collaboration, communication, leadership, and social and cross-cultural skills." (Trilling & Fadel, 2009). Moreover, as classroom debate differ from competitive settings in that it emphasizes the educational effect of debate. Using debate as a teaching effectively would me significantly more time than any other debate models. In order to solve this, flipped classroom let student study the topic beforehand. Instructor could then use classroom hour exclusively for pre-debate games, actual debate, and post-debate discussions which allow student to grasp better understanding of the topic and get feedback of their performance.

2.4 Flipped Classroom

In flipped classroom approach, what is traditionally uses in conventional classroom are reversed or "flipped." Lecture given by teacher's monologue in front of the blackboard are to be learned outside the classroom via online instructional videos, while the exercises usually done at home are put in the classroom. This allows for the possibility of teachers creating their own videos for their particular subject, or using other videos available online, including Khan Academy or TED Talks. The flipped classroom thus consists of two parts: computerized learning of material of outside of class, and interactive activities inside of class. Both sides of learning would ultimately create a learning environment (Strayer, 2007). The example of this technology is the use of Youtube to see videos uploaded online both produced by the course instructor or by outside sources. Student's could see different ideas on the topic and additional evidence via the use of search engines such as Google, Yahoo, or Baidu because they provide links to other sources such as news website or a blog of interest groups and documentaries with easy accessibility. Furthermore, there might be possibility of giving the aforementioned questions online through the use of online forms so that time for in-class activity is not wasted by the process of ensuring students' responsibility. Technology could also provide a platform on which learners and instructors could communicate outside classroom to ease students in their independent research with timeliness.

Students accessibility to online knowledge is indicative of how technological advancement has changed how we learn. The flipped classroom approach should be considered in the context of what Fletcher (2001) considers as technological revolutions in education. The first revolution came as the development of written language which allows ideas to *transcend time and place*. The second was caused by the printing press, allowing for the production of information *widely accessible to the mass*. We are now in the midst of the third revolution was ushered by the introduction of computers in education. People are now able to access *high-quality instruction* through computerized technology regardless of place and time at a relatively low cost.

Not only does information become easier and cheaper to access, but the increased amount and speed of information has also cause the life-span of information to be short. This new phenomenon of information led Connectivist theory to believe that learning in no longer restricted the information we now know, but our ability to gain more knowledge. As Siemens, one of the originator of the theory puts it: "Our ability to learn what we need for tomorrow is more important than what we know today. A real challenge for any learning theory is to motivate known knowledge at the point of application. When knowledge, however, is needed, but not known, the ability to plug into sources to meet the requirements becomes a vital skill."

This new understanding of the tectonic shift of our society into information society have significant implications in education in two areas: the learning environments and the students' skills. This change highlights the importance as well as opens up opportunity to use debate a method for active learning strategy.

Firstly, the third revolution of education has made more feasible the transition from one-way transfer of knowledge environments (from teacher to learner) to more interactive learning environments (Bransford et al., 2000). Not only do students not have to be dependent to the teacher to give them knowledge, because they are able to gain access to information by themselves – some of which might be more specialized that given by the teacher – they are able to seek knowledge beyond what was present in the curriculum. Debate works well with the approach as it emphasizes multiple viewpoints generated from information students have gathered, not those offered only by instructor. When students could learn by an external source of knowledge, the role of teacher in the classroom inevitably has to change. Alison King, for example, calls for a transition of teacher's role from "a sage on stage" to "a guide on the side." (King, 1993). Instead of giving knowledge to students, teacher merely acts as a coach for students by presenting additional information as to let student manipulate them and relate to what they already knew. Debate could therefore replace tradition lecture with active in-class activity which research has shown that students learn more effectively if the activity involve active analysis, discussion, and application of content in meaningful ways rather than by passive absorption of information (Bonwell & Eison, 1991).

Debate makes the way teachers organize their class different as they would have to be more meticulous in how they devise their lesson plans before, during, and after

class using different levels of cognitive learning in Bloom's taxonomy (Krathwohl, 2002). Class material given to students prior to the class would include lower-level learning which "students could master individually," and give a before-class low-stakes assessments to ensure student's compliance to self-study tasks and that they are able to make a constructive and relevant arguments. During debate, students are asked to apply their acquired knowledge in active learning strategies, thus using higher level of learning of Bloom's taxonomy such as application, analysis, and synthesis. The class then ends with assessment that is aligned with the learned content and in-class activities (Gilboy, Heinerichs, & Pazzaglia, 2015).

Secondly, While the aspect of the informational shift in education gives students more freedom of access to knowledge, they are also pressured to be responsible for there active role in learning and the way they approach knowledge in general. Student must learn to develop attitudes and skills appropriate for independently acquiring and selecting relevant knowledge amidst ever increasing amount of data. As Vail puts it, "learning must be a way of being – an ongoing set of attitudes and actions by individuals and groups that they employ to try to keep abreast of the surprising, novel, messy, obtrusive, recurring events…" (Vaill, 1996).

Debate train students to survive in the twenty-first century because it equips students with the ability to make judgments and make distinction between important and unimportant information and, to seek access to new and diverse information, data, opinion, and to recognize connection between fields of knowledge (Siemens, 2005). This skill is beneficial for learners as they are in control of their own learning process. The digital nature of the media assigned for students means that students can fast-forward over parts they already understood or replay parts of the material that is more complex and harder to understand. This approach allows students to learn at their own pace and invite them to make further inquiry into the subject of their interests. Classroom debate could then be used to establish common opinion differently understood by students of different capabilities. Faster-learning students could be given a more complex tasks while slower-learners could be instructed more by the teacher prior to debate. Debate allows for a more interactive and collaborative participation in class in manipulating information from different students. Study such as Gilboy et al.

(2015) and Butt (2014) shows a positive perspective of students on the approach as students prefer the method than lecture given by instructor.

Flipped Learning Network (2014) defines flipped classroom as a pedagogical approach, in which direct instruction is moved from group learning space to individual learning space, and thus transforming the group space into a more dynamic, interactive learning environment, where the teacher guides the students in applying concepts and engage in the subject matter in a creative manner. The Flipped Learning Network (2014) determines that in order for students and teachers to fully engage in a flipped classroom environment, the teacher must incorporate four pillars into their practice, namely, flexible environment, learning culture, intentional content and professional educator.

Flexible environment conveys the need for teachers to create flexible time and spaces where students can choose when and where they learn, whether it is in-class or outside of class by means of technological assistance. Additionally, teachers must also be flexible in their expectations of their student timeline for learning and their assessment of such student learning, so as to understand each student's learning pace. *Learning culture* focuses on in-class time, where it is dedicated to explore topics in extended depth and create rich learning opportunities through various activities. Thus, students are actively involved in knowledge construction as they participate in and evaluate their learning in a manner that is meaningful. *Intentional content* is the teacher's discretion to determine the materials that should be distributed and information and that needs to be taught, and what needs to be taught by the teacher and what needs to be assigned for the students to teach themselves. This serves the purpose of maximizing classroom time in order to adopt methods of student-centered, active learning strategies. Lastly, *professional educator* depicts the demanding role and responsibility of the teacher, where during class time, they need to observe students, providing them with instant feedback and assess their work constantly. While the teacher are less active in comparison to traditional classrooms, they are an integral piece to ensure the successful execution of flipped classroom.

Aside from the Flipped Learning Network, the International Society for Teaching in Education (ISTE) has also listed their own components required for a flipped classroom environment, with a different approach in comparison to that of the

Flipped Learning Network. These components are relationship building, personalized learning, passion-based learning, and project-based learning. *Relationship building* is viewed as one of the key components of the flipped classroom environment, to which it describes that teachers and students should maintain a positive relationship amongst each other in the classroom. A safe and comfortable classroom environment allows students to express themselves without fear of ridicule. *Personalized learning* refers to the personalized formative and summative assessments that allow students to demonstrate what they learnt, in order to complement each students' different and diverse learning styles. *Passion-based learning* refers to the opportunities that flipped classroom environment to explore their passions in authentic communication and critical thinking skills. *Project-based learning* allows students to apply their skills hands-on within the context of real life situations, which intends to improve students' authentic English communication.

With DIFLE's aim in improving students' speaking ability and critical thinking skills, both out-of-class and in-class activities, including classroom debates must be immersed and intertwined together through the utilization of a flipped classroom environment. Specifically, technological utilization, such as the distribution of online videos and materials must be executed properly by way of, for example, Google Drive or URL links, and at the same time, attain students' interest in the topic, so that the in-class activities could be conducted without any disinterested student. To this end, the components of flipped classroom environment listed by International Society for Teaching in Education does not entirely exhibit the focus that DIFLE requires. In particular, personalized learning, passion-based learning, and project-based learning are general components that describes the effect that flipped classroom environment should have on the students, rather than how such effect can be achieved. In this respect, the components listed by Flipped Learning Network (2014) provides a more direct and comprehensive description of how and what the teacher must do in order to successfully execute the DIFLE program as a whole. For instance, intentional content describes that the teacher is responsible for ensure that the online videos are distributed correctly and with the correct assignment assigned. Thus, this study is more suited in adopting the components listed by the Flipped Learning Network (2014) in order to maximize the students' potential in improving their critical reading skills and speaking ability.

There are limitations to the use of flipped classroom approach that might need to be addressed. The method requires extensive time and effort from the instructor in preparing and digitize class materials, as well as designing appropriate and engaging class activities. Furthermore, regular monitoring process must be ensured since in this approach students are held accountable to complete activities before coming to class. Student's incompliance to do pre-class assignment might lead to ineffective class hour and debate, as a student reported in a study by Butler (2014) suggest: "most of the time, students do not prepare ahead (although this is supposed to be the way). In this case, time spent in class doing questions is sometimes inefficient as students have yet to study the relevant materials."

2.4.1 Role of Flipped Classroom in DIFLE

As the flipped classroom consists of two components: the technological use, and the class activity which is executed by the instructor, there are great possibility for the instructor to use debate as a means to engage students in structured argumentation with the limited amount of time.

Some part of the debate activity to be done outside of classroom, ranging from doing research, to discussing with peers, to finding further evidence, to setting case for debate, in order to improve their performance during delivery. Instructor. Compared to the case where all of these tasks in the classroom with the supervision of the instructor, flipped classroom could efficiently allocate time for more active learning strategy. The additional time gained from delegating the task of give basic information to videos and online instruction, the in-class activities could by used for delivery and postdebate discussions. These are the process in which student intensively participate under the supervision and with guidance of the instructor. This extensive performance-feedback loop is crucial for improvement of students' ability in the objective of the study, and would be negated under the traditional classroom instructional strategy.

Once the variables are determined, the question turn to the instruction method to be used to improve the skills in both speaking ability and critical thinking. This research sees that the combination of debate instruction and technological use in flipped classroom environment might enhance students' ability of speaking and critical thinking.

2.4.2 Debate Instruction in Flipped Learning Environment

Debate instruction is a structured argumentation, general held between two opposing sides called the government and the opposition side, on a "motion" which might be a topic or a policy. The debate is carried out with government and the opposition then alternately engages in arguing for and against the proposed motion, and ends with an adjudication of the winning side based on pre-set criteria.

In DIFLE, this debate instruction is placed in a flipped learning environment, which could be defined as a classroom that is inverted from the traditional classroom. The key characteristics of flipped learning environment is its maximization of active learning activity in class hour by pushing passive learning activities outside class hour aside with the use of technology. Flipped learning environment offers a possibility for instructors to organize a more productive classroom when they want to incorporate debate into a class.

The relationship between the use of flipped classroom and debate is complementary; flipped classroom would need an active engagement in debate in order to create a deeper understanding on the subject, while debate allow this information to make personal significance to learners. This is because of an inherent problem within the concept of connectivist approach. While the media pool available for flipped classed room is vast and include the globally shared specialized knowledge, it lacks personal connection and meaning offered by active learning. Debate is such a tool that gives students the opportunity to personalize, if not localize the globally shared knowledge and thus putting knowledge to constructive relevance. Debate, on the other hand, is a complex and time consuming activity by default. It needs a better use of technology to allow teachers to better make room for the activity while does not sacrifice the complexity of debate.

Flipped classroom is necessary to complement debate instruction for several reasons. The first reason is that it gives the instructor more time in classroom for active learning activities. Both speaking ability and critical thinking are skills, which need to be practiced by doing, requiring instructors to design a class that has highly intensive interaction and which emphasize in-class activities. In flipped environment, parts of the learning which are traditionally passive could then be moved to outside-of-class time where technology could be used to give information needed. Students could basic information on an issue, such as death penalty or smoking, from videos available online while valuable time of class hour could be used for debate activity which enhance students' speaking ability and critical thinking through with active learning. The second reason flipped classroom is complementary to debate instruction is that it allows students to interact with real-life media and events. In the status quo, students engage in critical thinking through a given set of materials prepared by the instructor. Despite how diverse the material, it cannot compare to the diversity of information and opinions available online that students would encounter in their independent research. Therefore, learning debate in flipped learning environment allows student's practice of critical thinking to expand outside classroom context and into their everyday life.

2.5 Students' opinion toward DIFLE

2.5.1 Opinion

Opinion is a perception or judgment an individual hold towards a circumstance, person, or object. Therefore, students also hold opinion towards classroom organization and the content presented in it. Far from being abstract thoughts, student's opinion has real-world application and is an important factor for class instruction. While attitude is similar to opinion in that it referred an individual belief, they are different in that attitudes are the predisposition toward action while opinion is more general and might not require action.

Studies have shown that student's opinion of class activities plays a role in their learning, such as having associations with self-regulation – which might result in higher achievement in language learning and critical thinking –goal orientations (Ames, 1992) that could result in self-regulating learning, and is predictive of metacognition (Kareshki & Pakmehr, 2011). Study by Ghanizadeh and Alishahi (2016) indicated that four aspects of learners' opinion (interest, challenge, choice, and joy) had significant positive correlations with self-regulation (planning, self-monitoring, effort, and self-efficacy) of students or the ability to control one's learning and metacognition (Schraw & Dennison, 1994). Interest referred to student's interest in the subject; challenge referred to the opinion on difficult of the task and effort to perform; choice referred to students ability to choose and control their own learning process; and joy referred to the enjoyment student from participating in the study. Flum and Kaplan (2006) suggested that students who show interests in the topic, activity and classroom environment were more focused on skill development, thus leading to more exploration of overall aspects of learning.

Furthermore, a study by Passerini and Granger (2000) suggested that learners characteristics, such as attitudes, motivation, and belief must be identified, while another study such as Liaw et al. (2005) focused on external factor such as the multimedia instruction and teacher-student interaction. This is crucial since e-learning element in DIFLE is essentially self-directed, autonomous learning environment, and therefore should be considered in the study of opinion.

2.5.2 Components of opinion

This study chooses to use the approach highlighted by other studies (Liaw, 2007; Triandis, 1995) because it effectively incorporates the major factors mentioned in the above studies but also adds a positive or negative elements in each component. In this approach, students' opinion are divided into three components, which are affective, cognitive and behavioral components. Each of these components of opinion consist of positive or negative element.

The affective component is associated with the neural representation, which reflects the emotional, mood and feeling segment of an opinion, where the expression of emotions are surfaced and reacted upon external factors derived from an individual's values and belief. In other words, this type of affective-based opinion is utilized to validate one's belief or values. Such component is categorized into positive or negative affectiveness. Positive affectiveness is the positive expression of opinion towards an external object, which includes, but not limited to, the expression of delight, love, and excitement. Conversely, negative affectiveness includes, but not limited to, the dislike, disdain, hate, or anxiety towards an external object (Liaw, 2007).

The cognitive component is associated and related to an individual's mental belief and disbelief about something and have towards an external object. In this regard, the cognitive component functions as a "storage" for individual to organize their processed information, whether short or long term. An example of the cognitive component would include,for example, a belief that the object of opinion hold value for that individual. The cognitive component is categorized into positive and negative cognitive, where positive cognitive would consist of positive belief and evaluation towards an external object, while negative cognitive would consist of the opposite (Liaw, 2007).

Behavioral component is the verbal and nonverbal behavioral tendency to do, not do, or intend to do something in regard to the object of that opinion. This component of attitude reflects the intention of a person leading to response tendencies and overt actions when exposed to an external object. This deduces that such behavioral responses and actions would likely show some degree of organizational structure or predictability

(DeFleur & Westie, 1963). Similar to affective and cognitive components, the behavioral component can be categorized into positive or negative behavior. Positive behavior would include favorable responses to do something regarding that external object, while negative behavior conveys the opposite, unfavorable responses to a certain external object (Triandis, 1995).

The understanding and evaluation of students' opinion toward the class, therefore, is critical to the holistic understanding of the course since opinion reveal students' opinion on the DIFLE.

2.6 Conceptual Framework

The characteristics of debate and the concept of speaking ability and critical thinking are indeed interrelated. Thus a conceptual framework could be developed to propose a teaching method which enhances students' ability in the two areas. The graphic representation of Debate Instruction in Flipped Learning Environment (DIFLE) course to improve speaking ability and critical thinking is shown in Figure 1. The conceptual framework provides the ground to understand how different components of debate instruction could prompt development of the two variables: speaking ability and critical thinking in high school students.

In Flipped Learning Environment, the learning activity consist of two parts: the online activity and debate session (face-to-face activity). The online activity contains the predebate phase while the debate session consists of debate delivery and postdebate phase. The overall process starts with the online research, followed by in-class activities based on the lesson given in the online videos. The two consecutive classes has general exercises as its main component followed by a debate session in the third class which has two parts, that is the debate delivery phase and postdebate discussion phase at the end of the session before moving on to the next theme. This format and order remain the the same throughout the course, with the only changes being the debate themes and motions (thus the introductory video and research topic) and online lecture videos which progress along with the course.

Figure 1: Conceptual Framework Showing How DIFLE Contribute to the Improvement of Speaking Ability and Critical Thinking Skills
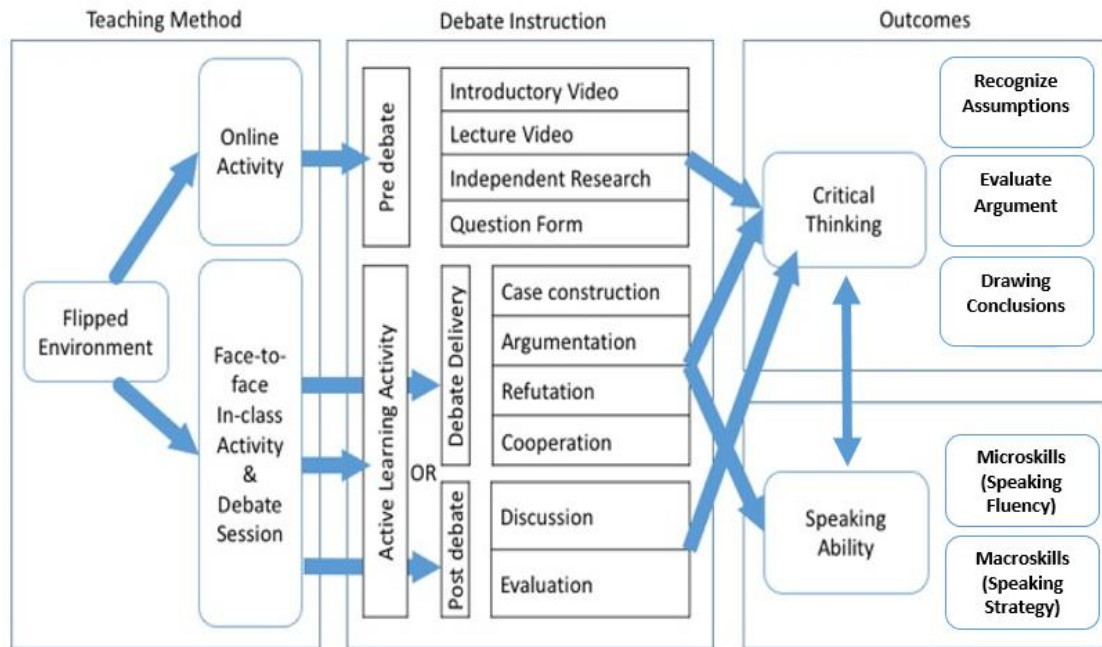
Predebate phase uses online activity as a prime platform for learning outside-of-class. It mainly concerns the preparation for the debate topic, which was announced in to previous class. Predebate phase has three components: 1) two videos, including introductory and lecture video; 2) independent research; and 3) answer of predebate question form. Introductory video, made by the instructor or obtained from other online sources, gives students the basic information on the debate topic, examples of way to analyze the motion, and related questions. In the lecture video, students learn lessons on debate given by the instructor. The topics of lecture are arranged into modules for beginner and intermediate level, and progress from one class to another. The topics range from debate rules and strategies, to argumentation, refutation, cooperation, and evaluation (elaborated in question 1.2). Students are required to do additional independent research to gather facts and opinions before answering a predebate question form online before each class begins.

Predebate phase is likely to help develop critical thinking in high school students because it contains lecture classes, which teach the meta-cognitive skills for debate. The independent research process also forces students to encounter various facts

and opinions of on the issue, and synthesize their new knowledge in such a way that allows them to respond to predebate questions. All of this requires students to exercise their argument analysis skills to, for instance, (1a) identify premises (reasons), counterarguments, and conclusions; and (1b) to understand the differences among opinion, reasoned judgment, and fact. The argument evaluation skills (2c) to judge the credibility of an information source, and (2d) to judging the consistency. And the argument synthesis skills (3c) to list alternatives and considering the pros and cons of each.

Debate sessions is a face-to-face activity which contains two debate phases: the debate delivery phase, and the postdebate phase. The former is the main part where students performs their debate tasks while the latter emphasizes the evaluation and provides feedback loop for improvement in the next debate session.

The debate delivery phase, second phase of DIFLE, starts at the beginning of the class hour. Six students out of all thirty participants are randomly assigned as debaters and divided into two teams, while other students are audience. In this process, debaters are given time to prepare for their speech with their teammates. Then they are required to delivery a 5-minute speech according to the debate procedure (as elaborated in question 1.2). Components of a typical debate delivery may include case construction, argumentation, refutations, and cooperation.

First, debaters *construct their case* by analyzing problems in the motion and their solutions, referred to as policy of model for government side, or counter-model for the opposition side. Secondly, debaters *construct arguments* to support of their team's case by using the information gathered during their independent research. Thirdly, where there are disputes in the issues, debaters must make *refutation* which would potentially weaken the opponents' argument, either by pointing out direct or indirect contradiction. For whip speakers, this may come in form of pointing out clashes of ideas in the debate. Lastly, they are required to *cooperate* with their teammates to organize their delivery as a team both at the preparation phase, where they determine speakers' role and during the debate.

Debate delivery phase could infer positive effects on critical thinking skills as it contains tasks that requires the students to analyze, evaluate, and synthesize arguments with minimal rehearsal. This means debaters could not rely solely on the

memorized arguments but rather must apply their prior knowledge to contingencies. To make a good debate delivery, debaters must exhibit argument recognizing skills, such as, but not limited to, (1a) identifying premises (reasons), counterarguments, and conclusions, and (1c) recognizing and avoiding common fallacies; argument evaluation skills, such as (2b) restating the problem to consider different sorts of alternatives, and (2d) judging the consistency, relevance to the conclusion, and adequacy of the way premises support a conclusion; and drawing conclusion skills, for instance (3a) producing reasoned arguments, and (3b) producing different types of propositions and reasoning.

The debate delivery is likely to enhance students' speaking ability as well because oral communication is the primary means through which the debates were conducted. Oral tasks in debate delivery requires student to perform extensive speaking task (through delivery extended monologue) and interactive speaking (through refutation and cooperation), and requires students to exhibit both micro- and macro-skills based on Brown's (2004) categorization. The micro-skills required students to (1a) producing fluent speech at different rates of delivery. The macro-skills required students to: (2a) appropriately accomplish communicative functions in academic settings, including proper level of words, (2b) convey links and connections between events and communicate such relations as focal and peripheral ideas, events and feelings, new information and given information, generalization and exemplification; and (2c) develop and using a battery of speaking strategies, such as emphasizing key words, rephrasing, providing a context for interpreting the meaning of words.

Though not immediately participating in the debate, students observing the debate as audience must also attentively listen to the debate and take notes; therefore, it requires the same receptive skills of critical thinking described in the pre-debate phase, but at a more intense level.

Finally, **the postdebate phase**, contains two interrelated parts: the discussion and evaluation of the debate. As soon as the delivery ends, the instructor randomly assign three students the role of debriefers who, after given brief preparation time, are required to give critical analysis of the debate based on their understanding and reasons. After debriefers finish their delivery, the whole class engages in discussion of the debate with the instructor moderating the discussion. Questions of discussion might

cover the topic to evaluate the idea in the debate as a whole or any speakers' performance based on what was, or what was not, present in the debate. The instructor may intervene in the discussion to give information and suggestion for improvements. The debates session ends with the class polling where all participants make decision as to which team has won the debate. This acts as impersonal feedback for improvement to all debaters an audience.

It is plausible to predict a positive effect on critical thinking skills from the the postdebate phase as the discussion and evaluation involves various tasks of the variable are present. The discussion and evaluation of debate requires students to perform *analysis skills*, including, but not limited to, (1a) understanding the differences among opinion, reasoned judgment, and fact, and (1c) recognizing and avoiding common fallacies; *evaluation skills*, including (2c) judging the credibility of an information source, (2d) judging the consistency, relevance to the conclusion, and adequacy of the way premises support a conclusion, and (2e) understanding how world views can constrain the problem-solving process; and synthesis skills, including (3a) producing reasoned arguments.

As all the components in each phase of DIFLE requires students to employ critical thinking skills, there is a likely causal relationship what would predict positive effect on high school students' critical thinking skills as a result of participation in DIFLE course. Likewise, oral communication constitutes the main channel of communication in DIFLE, both in delivery and postdebate phase; therefore, it is possible that participation in DIFLE could result in positive effects on speaking ability in high school students.

For classes that do not have debate session, the class would be conducted using learning activities that are also aimed to improve both the speaking ability and critical thinking of participants. These classes have multiple format for variety of exercises revolving on the theme that students would have to debate on the following class. Students were engaged in one theme for three weeks, of which debate session were held on the third. That is to say, there are two classes of activities without debate, prior to the debate session. Students still are required to watch online video on the topic and critical thinking skills and answer the predebate question form prior to each class. The exercises would be integrated with themes of the week. For example, a lesson might

teach student to rebut arguments in debate under the environment theme. In such a way, students tangentially learn the principle of critical thinking through exercises and application with domain knowledge and allow for a deeper discussion in the debate session. A part from mocking debate and exercise for specific aspect of debate, exercise might include simulations and mock debate rounds.

CHAPTER III
RESEARCH METHODOLOGY

In this chapter, the research design and methodology of the current study were discussed. The study designed the 9 session program of Debate Instruction in Flipped Learning Environment and tools to examine the effectiveness of the instruction.

This research employed a purposive sampling method, which used both the quantitative and qualitative analysis to answer the research questions on the effects of DIFLE on Thai high school students' English speaking ability and critical thinking and their opinion towards DIFLE. The key research tools employed to evaluate students' English speaking ability and critical thinking in this research were: 1) pretest-posttest median differences using Watson-Glaser test,, 2) speaking tasks 3) opinion survey questionnaire, 4) DIFLE rubric and 5) focus group interview questions.

The quantitative analysis was used to measure the difference in median score between the pretest and posttest that would prove the hypothesis on the effects of DIFLE in improving students' English speaking ability and critical thinking. The qualitative analysis was employed to observe the opinion of students toward the DIFLE course and its components.

The quantitative results were presented using descriptive statistics while the qualitative results were presented through content analysis gathered and analyzed from students' responses to the questionnaire and focus group.

3.1 Research Design

This study was done on a group of 24 students of respectively six different schools. Hence, the study was done using comparison of pretest and posttest of the same study group to measure the trend of development and result of the treatment using DIFLE. The following figure shows the design of this study:

Figure 2: Research Design

$$O_1 \qquad X \qquad O_2$$
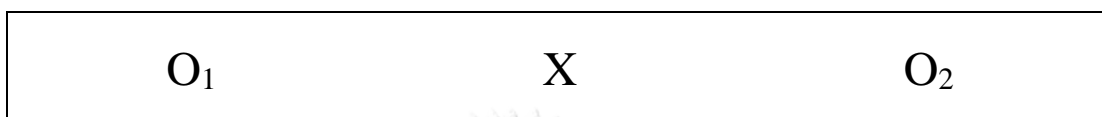
The group above the dotted line represents the experiment group while the one below the line represents the controlled group not engaged in the treatment

O   means   the pretest and posttest of DIFLE done on both experiment and controlled group

X   means   the DIFLE treatment to enhance students' English speaking ability and critical thinking

3.2 Participants

The researcher used an intact group. The participants of this research were high school students in grade 10 to 12 in Thai schools had the background of formal education in English or bilingual Program for at least 2 years and have received at least a 5.0 on IELTS (International English Language Testing System). Such criteria was essential as the speaking skills emphasized in this study required an intermediate level command of English. (Brown, 2004). The term "intermediate" is defined by the B1 Intermediate Level English, requirements established by the Common European Framework of Reference for Languages (CEFR), which are (i) to be able to understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc, (ii) can deal with most situations likely to arise while travelling in an area where the language is spoken, and (iii) can produce simple connected text on topics that are familiar or of personal interest, and (iv) can describe experiences and events, dreams, hopes and ambitions and briefly give reasons and

explanations for opinions and plans. Such factors are consistent with Brown's (2004) categorization of English speaking skills through micro-skills and macro-skills. Specifically, micro-skill's factors of (i) producing fluent speech at different rates of delivery and (ii) producing English stress patterns, words in stressed and unstressed position, rhythmic structure, and intonation contour, parallels with the CEFR's factor of "to be able to understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc" and "can deal with most situations likely to arise while travelling in an area where the language is spoken". Furthermore, macro-skill's factors of (i) appropriately accomplish communicative functions in academic settings, including proper level of words, and (ii) conveying links and connections between events and communicate such relations as focal and peripheral ideas, events and feelings, new information and given information and exemplification, are consistent with CEFR's factor of "can produce simple connected text on topics that are familiar or of personal interest". Lastly, the final macro – skills factor of "developing and using a battery of speaking strategies, such as emphasizing key words, rephrasing, providing a context for interpreting the meaning of words' parallels to CEFR's factor of "can describe experiences and events, dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans". Thus, intermediate level of English ability is defined through CEFR, and is consistent with Brown's (2004) categorization of English speaking skills of micro and macro-skills. The research was conducted on 24 students that came from high schools in Thailand. To balance the gender difference, the group of 24 students consisted of 12 females and 12 males. The students participated in DIFLE course for 9 sessions where they learned the introduction to social issues and debate skills through online technology, and were subjected to pretest, posttest opinion survey questionnaire and focus group interview.

The study was conducted at "Kev's Academy", an institute which offers English language and SAT math test preparation course. DIFLE course were conducted three times a week on Tuesday, Thursday, and Saturday. In order to control possible confounding and intervening variables, the students who volunteer to participate in the DIFLE course were asked to not enroll in any other course during the period of the study. This ensures that the only source of enhancement in the variables are the result of the course.

After finishing DIFLE, all students were asked to answer 5-point Likert scale and open-ended questionnaire. In order to get a variety of different opinions from different learners, six students were selected to a focus group interview, who were selected from the two top scorers and two bottom scorers, and two middle scorers in the pretest-posttest difference.

3.4 Research Procedures

Two phases of the research were done which were the preparation of the Debate Instruction in Flipped Learning Environment and the implementation of DIFLE. The detail of stages in each phase is presented as follows:

Table 6: Research Procedure

Phase 1: Preparation of the Debate Instruction in Flipped Learning Environment	
Stage 1.1	Study the concepts related to speaking ability and critical thinking, and debate instruction and flipped classroom
Stage 1.2	Construct of the lesson plan
Stage 1.3	Validation of the lesson plan
Stage 1.4	Revision of the lesson plan
Stage 1.5	Construction, Validation, and Revision of instruments
Stage 1.6	Pilot study
Stage 1.7	Revision after the Pilot Study
Phase 2:	Implementation of the Debate Instruction in Flipped Learning Environment
Stage 2.1	Pretest the English speaking ability and critical thinking
Stage 2.2	Conduct the Debate Instruction in Flipped Learning Environment and evaluate students' performance in English speaking ability and critical thinking after each debate session
Stage 2.3	Posttest the English speaking ability and critical thinking and administer the survey of students' opinion toward the instruction model
Stage 2.4	Data analysis

Phase 1: Preparation of the Debate Instruction in Flipped Learning Environment

Stage 1.1: Study the concepts related to speaking ability and critical thinking, and debate instruction and flipped classroom

The researcher studied the general concepts and controversies surrounding the objective skills of speaking ability and critical thinking, and teaching methods including Debate Instruction and Flipped classroom. The study draws on other previous studies on both topics from journals, documents, articles, books, research which were related to this study. These studies included, but are not limited to, studies on the BPD model format in terms of debate instruction in conjunction with the integration of a Flipped Learning Environment. Additionally, the speaking ability and critical thinking skills of debate is defined and elaborated based on other on Brown's (2004) macro-skills, while the critical thinking skills of debate is largely based on Fisher's (2011) list of fundamental critical thinking skills as well as Diane Halpern's (1994) categorization through "Halpern's Categorization of College-Level Critical Thinking Skills", which provides for a more detailed, condensed categorization of critical thinking skills. This study is also based on Tumposky (2004), to which debate leads to the improvement in the ability of critical thinking, and, lastly, the studies of Trandis (1977), Liaw (2007) and Jain and Kaur (2004) functions as the opinion components of this study. The researcher also studied the general concepts and controversies surrounding the teaching methods including Debate Instruction and Flipped classroom based on Bergmann and Sams (2014)

Stage 1.2: Construction of lesson plans

The lesson plans of DIFLE were constructed based on the flipped learning approach suggested by Bermann and Sams (2014). Debate instruction were integrated with the Flipped Learning Environment based on the Broad Participant Model. The researcher constructed a total of 9 lesson plans, each containing a pre-debate phase, debate delivery phase, and post-debate discussion phase. The construction of lesson plans included the construction of the online lecture videos, the DIFLE rubric, and the teaching procedure. Based on the data from debatabase.org, world school's debating website and Thailand Highschool Debating Championship organization, the three most

popular themes were selected to be the themes of the DIFLE lessons. These themes are social justice, education, and gender.

1.2.1 Unit structure

For all 9 two-hour classes, each unit of DIFLE course is organized in the same format. As the activities are divided into two parts, online and face-to-face activity, students are responsible for their commitment in the first part of the class. The lecture videos in the predebate phase which give lessons on the basic of debate and critical thinking changes for every class. The DIFLE course is divided into units, each of which contains one "theme" or a particular topic area, ranging from social justice, education, and gender. There are three classes per unit with the first two classes go without debate session. The third class of every unit is debate session where students debate for 5 minute each. For the debate session, the length of class might extend to accommodate the amount of students debating. Each unit's lesson corresponds to the variables determined to improve students critical thinking skills through debate. The critical thinking principles, however, progress throughout the course regardless of the change of unit and theme. Figure 3 visually represents the organization of unit sequence for a 9 session DIFLE program.

Figure 3: Sequence and Organization of Units
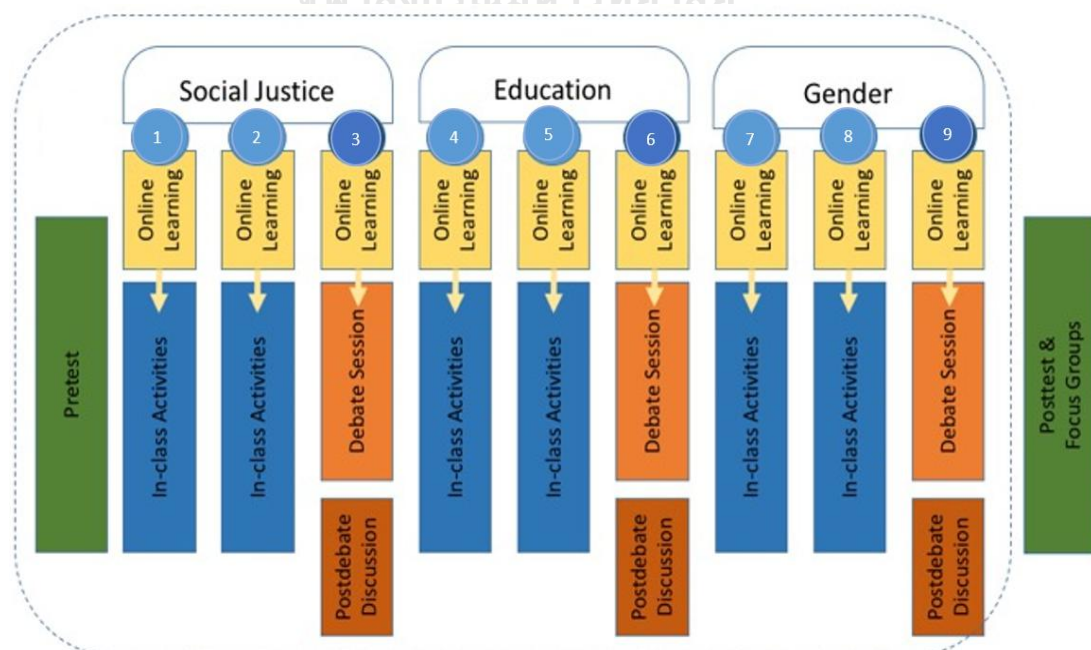
1.2.2 Debate Procedure

Speaking order in the debate alternates between two benches without any pauses. The first speaker of the government (affirmative) bench starts the debate and is followed by the first speaker of the opposition (negative) bench. The speech alternate back to the government side's second speaker and the order goes on until the last speaker of the opposition bench has done his or her speech.

Figure 4: Order of Speakers
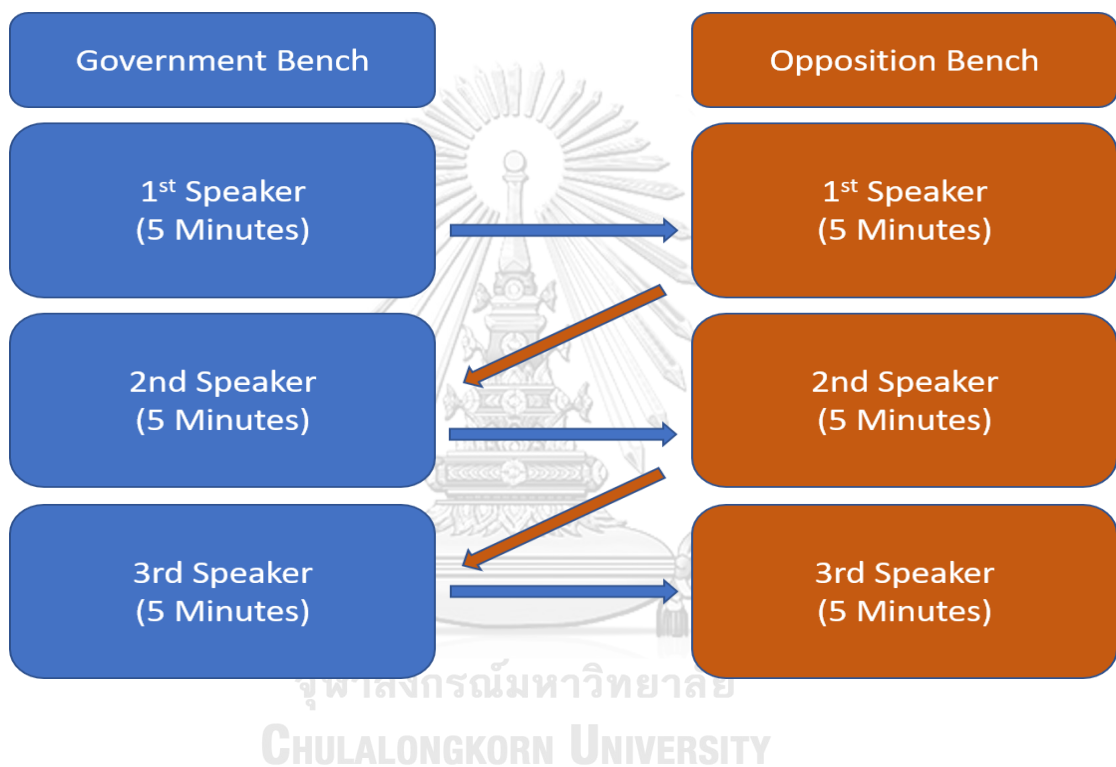
Table 7: Modules of DIFLE with three main components of debate

Class	Theme	Motions	Video and Class Lesson	Outcomes
Pretest : 1		This House would ban animal testing	• Understanding Rules & Procedures • Analyzing Motions: Identifying Issues and Doing Research	• Critical thinking - analysis skills - evaluation skills
2	Social Justice	This House would ban the death penalty	• Making Arguments: Structure, claims and supports • Uses of strategic language	• Critical thinking - synthesis skills • Speaking Ability - macro-skills
3		This House would legalize the sale of human organs	• Constructing Case I: Definition and Characterization	• Critical thinking - analysis skills - synthesis skills
4		This House believes that assisted suicide should be legalized	• Working with Team: • Speaker's role / Team split	• Critical thinking - synthesis skills
5	Education	This House believes single-sex schools are good for education	• Judging Debate and Arguments I	• Critical thinking - evaluation skills
6		This House would ban junk food in school	• Establishing case line • Identifying Burden of Proof/Refutation	• Critical thinking - analysis skills - evaluation skills

7		This House would ban homework	• Constructing Case II: Making Different Types of Propositions (causal, value & policies)	• Critical thinking - synthesis skills
8	Gender	This House believes that mothers should stay at home and look after their children	• Identifying Fallacies & Logical Errors	•Critical thinking - analysis skills - evaluation skills
9		This House believes parents should be able to choose the sex of their children	• Making Rebuttals & Points of Information (POIs)	•Critical thinking - analysis skills - evaluation skills - synthesis skills
10		This House believes homosexuals should be able to adopt	• Judging Debate and Arguments II	• Critical thinking - evaluation skills
Posttest		This House would ban school uniform		

1.2.3 Motions

The motions chosen are ranked among the top 30 most popular debate motions by the website idebate.org (as of 2016), one of the leading debate motion database available online for people interested to improve their debate skills. Students could benefit from the popularity of the topic when doing an individual research, since they would be able to draw on a wide pool of resources. Furthermore, apart from the popularity of the topic, the motions are chosen by researcher from the relevance of the topic to the students. The topic about social justice, education, and gender are broad and widely debated topic that students would be unlikely to avoid in the media. Thus, a critical knowledge in these fields is considered valuable.

1.2.4 Teaching Procedure

DIFLE course teaches different skills of debate including Debate Rules and Strategies, Argumentation, Refutation and Cooperation, and Evaluation and Adjudication, incorporated into the theme in each unit. These lessons correspond to the components of debate throughout the three phases of DIFLE. The sequence is designed to progressively enhance students' speaking ability and critical thinking, progress from the fundamental level at the beginner level to the more complex lesson in intermediate level.

The first half of the lessons concerns mainly with the construction of arguments that students could prepare individually or with team. The foundation on debate rules and procedure, on analyzing motions in order to identify issues and definitions of debate, and on characterizing actors and events involved in the debate are necessary for students to start debate in a systematic and structured manner. The lesson then progresses to the construction arguments with basic knowledge of structure and supports of argumentation. Students also receive instruction on the basic process of teamwork, which involves discussion, speakers' role assignment, and team split of arguments, and on the principle to evaluate arguments and adjudicate a debate. Additionally, lesson on speaking ability in debate context are incorporated in the lecture video to give lesson on the proper level of words in academic setting and uses of strategic language such as signpost, connecters and emphasis of keywords.

Once the foundation has been laid out, the course advances to second module, the intermediate phase. Instruction given to students in this module emphasizes the interactive tasks in debate which engage directly to opponent's arguments. The lesson teaches students to recognize fallacies, and to use those mistakes against their opponent for their team's advantage through interaction points such as rebuttals and Points of Information. Students also learn to construct the case and adjudicate debate at a more advanced level. The purpose is to engage student more actively with their opponent's arguments by finding contradictions or clashes of ideas. The second lesson on constructing case in debate would allow student to identify types of propositions made by their opponents more easily. Students assigned the role of opposition would also be able to make a counter-model, a "better" alternative to the government's option.

Drawing on previous studies on all the related concepts, the researcher construct lesson plans that is expected to enhance skills in speaking ability and critical thinking. The phases of the lesson plan in DIFLE consists of parts outside and inside of class. The first part involves students going online to study computerized information on topic, which could come in forms of introductory video uploaded by the instructor or independent research on the topic from other sources. This predebate phase is concluded with students answering questions through online forms.

The delivery and postdebate phase are done inside classroom context with teachers moderating the entire process and assigning different roles to students from week to week. Each debate session is followed by postdebate discussion session to reflect on the debate and give share ideas, propose alternatives and give feedback to the whole class. Two motions of the same theme, called one unit, are debated consecutively before moving to a motion under another theme.

1.2.5 Online Sessions

After the motion is given in the class, students are instructed to go online, using the URL and video title, to watch uploaded video on YouTube. The introductory video gives basic information on the debate topic and a set of questions are given to students for further independent research.

Then students are required to watch the lecture video particular to that unit according to the sequence laid down above in the same fashion as the introductory video. At the end of the video, students are given document containing an exercise in Google Drive accessible via website URL. The debate and argumentation exercise corresponded to the lesson taught in lecture video. For example, a lecture on argumentation in unit 2 is paired with an exercise to identify conclusion and premises in arguments (see Appendix E). Students send their finished exercise to the instructor. The answers and explanation to the exercise are given at the end of the unit debate session in a video form.

At the finishing all online session and independent research, and one day prior to class, students are required to answer an online predebate question form, consisting of 5 questions, which asks them to synthesize the basic information and different ideas on the topic in short paragraphs. The questions are: 1) What is the issue? 2) What are the three main arguments from the government side for/against the policy? Identify the strongest argument; 3) What are the three main arguments from the opposition side for/against death penalty? Identify the strongest argument; 4) What are the possible clashes between the ideas of criminal justice as retribution and as rehabilitation. 5) What are additional point you have found in your independent research on death penalty? 6) Do you think argument analysis of the topic effects your quality of learning? 7) What were the difficulties/challenging issue you encountered during your individual research? The wording for each question is adapted for motions.

Stage 1.3: Validation of the lesson plan

After the lesson plan was designed, the lesson plan was sent to three experts to evaluate the validity of the lesson plan using the Item-Objective Congruence Index. The experts were given evaluation form to rate each item.

The value of IOC evaluation could be described as follows:

+1	meant	Congruent
0	meant	Questionable
-1	meant	Incongruent

The value were used in the validation process using Item-Objective Congruence Index according to the results given from three experts, which had the following formula:

$$IOC = \frac{R}{N}$$

| IOC | meant | the index of congruence |
| R | meant | total score form the opinion of |

the experts

| N | meant | the number of experts |

The value of IOC ranges from -1 to +1 and were the average of the scores given by experts. The item which were scored higher than 0.5 would be considered valid and accepted as being congruent with the objective, while the item which scored lower than 0.5 would be considered incongruent and thus were subject to revision.

The experts were asked to evaluate the DIFLE: lesson plans in three aspects 1) the scope and sequence; 2) the class session and; 3) the debate session. The lesson plan was given the overall score of 0.7, which indicated that the three experts agreed that lesson plan was congruent with DIFLE objectives and valid. The result was is shown in Table 8.

Table 8: IOC index results on the lesson plan

Item	Analysis from experts			IOC score	Results
	1	2	3		
Class Session					
Is the TIME PERIOD appropriate for teaching procedure?	-1	1	1	0.33	invalid
Is the TEACHING MATERIAL appropriate for the students?	0	0	1	0.33	invalid
Debate Session					
Are all predebate QUESTIONS able to evaluate student's understanding on the debate motion?	1	0	0	0.33	invalid

Even though the overall aspect of the lesson plan was considered valid, there were three objects in the lesson plan which were given the score lower than 0.5 and were considered invalid and needed revision. These include the appropriateness of time period, the independent research and its ability to enhance students' critical thinking and the predebate questions on their relationship to the understanding of the debate topic.

Stage 1.4: Revision of the lesson plan

After validation process, the lesson plan was adjusted based on the expert's suggestions before being employed in the main study. The revision of lesson plan resulted in the extension of time period, reconsideration of evaluation of effects of independent research on critical thinking, and the revision of pre-debate questions. The detail of the revision of lesson plan was as follows:

In terms of extension of time period, two experts have commented that, due to the nature of debate and speaking lessons, the time period of a 2 hours class may be too short and would risk the extension of the class on a regular basis. In this case, the experts suggested for the class time period to extend to 3 hours in the debate session to allow all students to participate and allow for more time for post-debate discussion. Therefore, the appropriate revisions have been made. The original class time period was 2 hours, and has now been revised to last for 3 hours to accommodate this lesson plan.

In terms of the reconsideration of evaluation of effects of independent research on critical thinking, in accordance to one expert's comment and the result in the IOC

index, there were too many worksheets, which rendered the class to be less interactive and would hinder student's speaking ability and thus should be changed in order to maintain the active-ness of the class. Based on these comments, the following have been revised. The amount of worksheet was decreased, and class activities focused more on interactive activities that require less reading and writing skills such as speaking task, role playing and mini-debate games.

In terms of the revision of pre-debate questions, two experts have commented that the use of pre-debate questions, which were designed to evaluate students using a rubric specifically designed for independent research, was not compatible to its purpose. The experts further clarified that the pre-debate questions merely acts as a guideline for students' independent research and were not used to evaluate comprehension of the topic or critical thinking. Therefore, the experts recommends for the rubric for independent research to be dropped. In this case, the revision has followed suit, and the rubric for independent research has been removed from this study.

Stage 1.5: Construction and Validation of instruments

Instruments in the course include the Speaking Tasks, Online Session, Opinion Survey Questionnaire, and DIFLE Rubric, whose development were discussed as follow:

1.5.1 Speaking Tasks for Pre and Post Test

Speaking task was individual tasks that students were required to do for the pretest and posttest of the DIFLE program in order to answer research question number 1. The task involves giving impromptu speech on a given topic. The topic for the pretest was Animal testing, while the speaking topic for the posttest was on School uniform.

The speaking pretest and posttest consisted of four tasks, including impromptu speech, identification of strength and weakness of arguments, identification of focal and peripheral point, and role playing. Since the impromptu speech was the first task and required that student give speech without any time to prepare, students were not required to read the background. For second to forth task, students were required to perform harder tasks and thus needed the background of the topic.

Even though the purpose of the test was to evaluate speaking ability, it is crucial that student engage in an academic discussion with the level of debate so that the language level used in the pretest and posttest were as close to the language level used in real debate session as much as possible. Apart from the background, the given essay also summarized different sides of arguments concern the given topic, thus facilitate the tasks for student to come up entirely with their own argument. This allowed them to focus more on the speaking ability.

Stage 1.5.1.1: Validation and Revision of the Pre-Test and Post-Test

After the pre-test and post-test were designed, the pre-test and post-test were sent to three experts to evaluate their validity using the Item-Objective Congruence Index. Since the pre-test and post-test were designed in a similar manner, the evaluations by the experts were near-parallel as well. The experts were given evaluation form to rate each item.

The value of IOC evaluation could be described as follows:

+1	meant	Congruent
0	meant	Questionable
-1	meant	Incongruent

The value were used in the validation process using Item-Objective Congruence Index according to the results given from three experts, which had the following formula:

$$IOC = \frac{R}{N}$$

IOC	meant	the index of congruence
R	meant	total score form the opinion of the experts
N	meant	the number of experts

The value of IOC ranges from -1 to +1 and were the average of the scores given by experts. The item which were scored higher than 0.5 would be considered valid and accepted as being congruent with the objective, while the item which scored lower than 0.5 would be considered incongruent and thus were subject to revision.

According to the IOC Index results, the total mean score of the IOC of the pre-test and post-test is 0.627, possibly indicating that the test is reserved. The scores for the majority of the items range from 0.698 – 1.000, which suggests that these items are suitable. After the validation process, the pre-test and post-test was adjusted based on the expert's suggestions before being employed in the main study. However, according to a multitude of renowned experts, certain items were subjected to modification, specifically, in terms of the timing for each task (items 1-4), task instructions (items 2 and 3) and choice of words for certain tasks (items 1,4). The detail of the revision for the pre-test and post-test are presented below.

In terms of the timing for each test, the experts had timing concerns that were specific to each tasks with regards to the student's answer preparation time and presentation time. Before revision of item 1, there were no time limit given to the impromptu speech. One expert suggested for students to answer all 4 questions at once, instead of answering each questions separately in order to simulate an actual speech. Therefore, since the answer would most likely be in the form of a speech, the expert suggests to put a maximum time restriction to the speech to 5 minutes. From this comment, the revision was made.

Original Version

"Please answer the following general questions. You will not have time to prepare your answer"

Revised Version:

"Please answer the following general questions in one speech. Your speech must not exceed 5 minutes. You will not have time to prepare your answer."

For items 2 to 4, two experts have commented that the original time limit of 15 minutes set for students to read the passage in order to perform the tasks in tasks 2 – 4 is too short. They have reasoned that such short duration does not accurately measure student's critical thinking in a fair sense, as each student have different reading pace, and such short duration would be unfair to those who reads in a short pace. Thus, the experts have suggested to extend the time limit from 15 minutes to 25 minutes in

order to accurately evaluate student's critical thinking skills. Thus, the revisions were made accordingly:

Original Version

"*You have 15 minutes to read the given passage and answer the following questions*"

Revised Version:

"*You have 25 minutes to read the given passage and answer the following questions*".

Furthermore, three experts have also pointed out that there were no time specification for student's speech delivery for tasks 2 – 4, and had strongly suggested on putting a time specification, in which the suggested for two minutes. Thus, in pursuant to their comments, the instructions for task 2-4 are amended as follows:

"*You have 25 minutes to read the given passage and answer the following questions. Your answer must not exceed 2 minutes*."

In terms of task instructions, one expert commented that task 3 should be placed before task 2, due to the structural logical flow of the two tasks. That is, it is more reasonable for students to first identify the main clash points and supporting details before identifying the strength and weakness of the arguments from both sides. Furthermore, this structure would also stimulate students to critically think about main points of the passage, and by using those main points, they would then categorize and analyze which main arguments belong to which side, and determine the degree of strength and weakness of each argument of each side. As a response to this comment, the following revisions were made.

Original Version

Task 2: Identify the strength and weakness: Which one do you think is the strongest and weakest of both sides

Task 3: Focal and Peripheral point identification. Please identify the main clash points and supporting details of the opponent to animal testing.

Revised Version:

Task 2: Focal and Peripheral point identification. Please identify the main clash points and supporting details of the opponent to animal testing.

Task 3: Identify the strength and weakness: Which one do you think is the strongest and weakest of both sides

In terms of the choice of words for certain tasks, item 4 regarding roleplaying was criticized by two experts, where they found the instruction of task 4 to be too vague and complex for students to understand. In particular, they have specified that the instruction of "…using a proper level of word appropriate to this situation" to be unclear, and such instructions may confuse the students and thereby hinder their actual critical thinking ability. In this respect, one of the expert suggests to change task 4's instruction to "please give a formal speech", as such word choice would be simple and straightforward for students to understand. Therefore, the appropriate revisions have been made.

Original Version

"Please give a speech using a proper level of word appropriate to this situation",

Revised Version:

"Please give a formal speech".

Finally, while the aforementioned revisions and amendments are applicable to both pre-test and post-test, one expert had specified that only the general questions of the pre-test needed revision, and post-test can remain the same. In this respect, the expert emphasized that some of the pre-test task 1 general questions consist of choice of words that are not open ended, and are rather reserved in this case. For instance, the

question of "How many family members do you have" can easily be answered without any elaboration required, which defeats the purpose of the study to evaluate the critical thinking and speaking ability of a student. The expert has thus suggested the addition of words such as "why" or "why not" that would transform the question into a more open ended question. In this respect, the following revisions have been made accordingly.

Original Version

"How many family members do you have?" and *"Do you keep any pet at home?"*

Revised Version:

"How many family members do you have, who are you closest to and why?" and *"Do you keep any pet at home? Why or why not?"*

The last question under task 1 can remain unchanged, as the expert has stated that the question is already open-ended by the inclusion of "Do you *think* people who have pets can empathize more with animal suffering?"

In addition, two inter-raters ascertained the reliability of the results of the speaking ability. The inter-rater reliability was tested using Pearson Correlation Coefficient.

Table 9: Pearson Correlation Coefficient of Inter-Rater Reliability

Raters	r
$R_1 + R_2$	.852

As shown in Table 15, the overall result of the Pearson Correlation Coefficient of Interrater Reliability was 0.852 from all units grading. The correlation values imply that the scores given by the two raters are consistent.

The two interrater also ascertained the reliability of the results of students' critical thinking skills.

Table 10: Pearson Correlation Coefficient of Inter-Rater Reliability

Raters	r
$R_1 + R_2$	.918

As shown in Table 16, the overall result of the Pearson Correlation Coefficient of Interrater Reliability was 0.918 from all units grading. The correlation values imply that the scores given by the two raters are consistent.

1.5.2 DIFLE Rubric

The rubric was used to evaluate the speaking ability and critical thinking skills of students in classroom. The rubric is divided into two sections: the first evaluates the students research skills with the use of online technology during the predebate phase outside of classroom; the second section evaluated student's performance during delivery phase which is consists of criteria for critical thinking and language use.

Since the purpose of this research is to find the effectiveness of Debate instruction using flipped learning environment (DIFLE), some of these tasks proposed by Brown are selected that correspond with debate. By its nature, debate is categorized as a combination of what Brown's (2004) refers to as *extensive* and *interactive speaking*, the 5-minute extended monologue, rebuttals, counterplans and points of information posed by opponents. However, debate is a complex task in itself and involves discussion

of issues in a very deep level, the micro skills of speaking are taken very little into the consideration of debate objectives. Rather, the debate instruction is more suitable for students who are already familiar with English speaking and grammatical use. Therefore, the participants in the DIFLE research are required to have a background of at least 2 years in English Program. And for this reason, only one of the micro-skills are selected, which is the fluency of speakers. The majority of selected tasks are adapted tasks from Brown's (2004) macroskills, which concerns mainly with the strategic use of language to convey meanings in academic context. The adapted version used in this research are the following presented in Table 9:

Table 11: The list of skills in speaking ability to be enhanced by Debate Instruction in Flipped Learning Environment (DIFLE)

Speaking Skills to be enhanced by DIFLE
• Micro-skills a. producing fluent speech at different rates of delivery b. Produce English stress patterns, words in stressed and unstressed position, rhythmic structure, and intonation contours.
• Macro-skills a. appropriately accomplish communicative functions in academic settings, including proper level of words b. conveying links and connections between events and communicate such relations as focal and peripheral ideas, events and feelings, new information and given information, generalization and exemplification c. developing and using a battery of speaking strategies, such as emphasizing key words, rephrasing, providing a context for interpreting the meaning of words

Drawing on the Fisher's (2001) and Halpern's (1994) lists of critical thinking skills, the researcher devised chose the skills that were to become the criteria of evaluating critical thinking skills in DIFLE and which were subsequently used to create DIFLE rubric as follows (Table 10):

Table 12: Critical Thinking Skills intended to be enhanced by Debate Instruction in Flipped Learning Environment (DIFLE)

Critical Thinking Skills to be enhanced by DIFLE

1. Argument Analysis Skills

    a. identifying premises (reasons), counterarguments, and conclusions;

    b. understanding the differences among opinion, reasoned judgment, and fact;

    c. recognizing and avoiding common fallacies such as straw person, appeals to ignorance, slippery slope, false dichotomy, guilt by association, and arguments against the person.

2. Argument Evaluation Skills

    a. considering pros and cons of solution and alternatives

    b. restating the problem to consider different sorts of alternatives;

    c. judging the credibility of an information source;

    d. judging the consistency, relevance to the conclusion, and adequacy of the way premises support a conclusion.

    e. understanding how world views can constrain the problem-solving process.

3. Argument Synthesis Skills

    a. producing reasoned argument;

    b. producing different types of propositions and reasoning.

    c. listing alternatives and considering the pros and cons of each;

Since the intervention using DIFLE course is designed for high school students, certain skills are adjusted in order to easily instruct and evaluate the skills in this research. high school students should be able to analyze the arguments by breaking them into parts and recognizing their validity.

Creating a rubric

The following rubric to be used by the instructor is a synthesis of the two criteria for both predebate and delivery phase mentioned in literature review to create holistic criteria for evaluating students' performance in one debate session. The results of each session during the whole DIFLE course would be compared for analysis of the data.

The higher performance according to this criterion could be achieved by students who have a deep understanding of the topic as well as having done additional research apart from that provided by the instructor. Students should provide evidence from outside of class basic instruction from credible source.

Combining all of the mentioned criteria, the end result is a two-part rubric which aims to evaluation the predebate research skills, critical thinking, and speaking ability. The complete form of DIFLE Rubric is what follows:
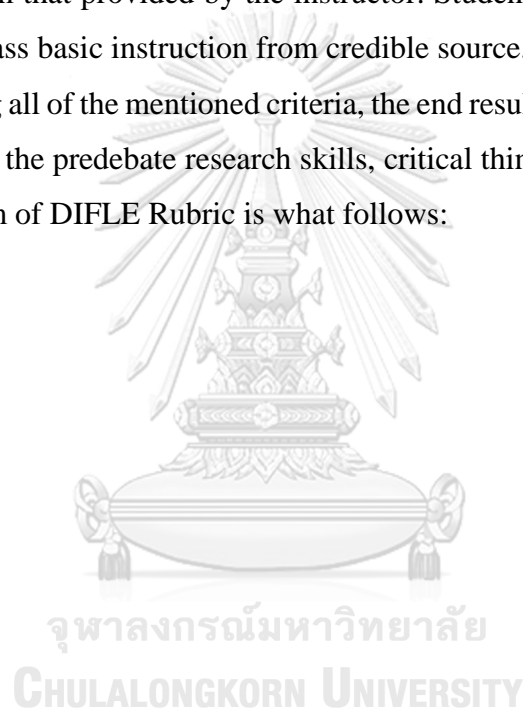
Table 13: DIFLE Rubric designed to evaluate student's research skill, critical thinking and speaking ability.

	5	4	3	2	1
Critical Thinking					
Case Construction	The problems and motion were clearly, thoroughly, and fairly defined and are consistent with proposed solution/counter-model.	The problems and motion were sufficiently and fairly defined and are consistent with proposed solution/counter-model.	The problems and motion were minimally and fairly defined, and are consistent with proposed solution/counter-model.	The problems and motion were vaguely and defined, and is slightly consistent with proposed solution/counter-model.	The problems and solution/counter-model were not, or unfairly, defined and are not consistent with solution/counter-model.
Argument Construction	All arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.	Most arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.	All arguments were clearly tied to an idea (premise) but the organized was sometimes not clear or logical.	Arguments were not tied well in an idea.	Arguments were not tied to an idea at all.
Refutation	All counter-arguments were accurate, relevant and strong.	Most counter-arguments were accurate, relevant and strong.	Most counter-arguments were accurate, relevant, but several were weak.	Some counter arguments were weak and irrelevant.	Counter-arguments were not accurate and/or relevant.
Use of Information	All information presented in this debate was clear, accurate and relevant.	Most information presented in this debate was clear, accurate and relevant.	Most information presented in this debate was clear and accurate, but not	Some information presented was accurate, but there were some minor	Information has some major inaccuracies OR was usually not clear.

	5	4	3	2	1
			usually relevant.	inaccuracies.	
Speaking Ability					
Speaking Fluency: speech flow	Speaks smoothly, and communicates without hesitation.	Speaks smoothly, with little hesitation that does not interfere with communication.	Speaks with some hesitation, but it does not usually interfere with communication.	Speaks with some hesitation, which often interferes with communication.	Hesitates too often when speaking, which often interferes with communication.
Speaking Fluency: Pronunciation and intonation	Pronunciation and intonation are always very clear/accurate	Pronunciation and intonation are almost always very clear/accurate	Pronunciation and intonation are usually clear/accurate with a few problem areas.	Pronunciation and intonation errors sometimes make it difficult to understand the student	Frequent problems with pronunciation and intonation
Speaking Strategies: use of signposts	Employment of speaking strategies such as signposts, connectors.	Employment of speaking strategies such as signposts, connectors.	Employment of speaking strategies such as signposts, connectors.	Employment of speaking strategies such as signposts, connectors	Employment of speaking strategies such as signposts, connectors
Speaking Strategies: emphasis of ideas	Student was able to clearly emphasize ideas and their relations and paraphrasing were pervasive.	Student was able to emphasize ideas and their relations and paraphrasing were frequently.	Ideas and their relations were sometimes clearly presented, and paraphrasing were occasional.	Ideas and their relations were unclearly presented, and paraphrasing were scare.	Ideas and their relations could not be distinguished, and paraphrasing were non-existent.

Stage 1.5.2.1: Validation and Revision of the DIFLE Rubric

Upon the completion in designing the DIFLE rubric, it was sent to three experts to evaluate by way of validation under the Item Object Congruence Index, and revision. The value of IOC ranges from -1 to +1 and were the average of the scores given by experts. The item which were scored higher than 0.5 would be considered valid and accepted as being congruent with the objective, while the item which scored lower than 0.5 would be considered incongruent and thus were subject to revision.

According to the IOC Index results, the total mean score of the IOC of the DIFLE rubric is 0.522, possibly indicating that the test is reserved. The scores for the majority of the items range from 0.651 – 1.000, which suggests that these items are suitable. After the validation process, the DIFLE rubric was adjusted based on the expert's suggestions before being employed in the main study. However, according to several academic experts, certain items are to be modified and amended, as it will be explained in detail below.

First, the three experts have emphasized that the DIFLE rubric was too general, and did was not suitable with the study. They reasoned that generic items such as "Information", "Rebuttal" and "Use of Facts/Statistics" will not suffice, because such categories do not reflect the evaluation of the variables in accordance with the study. They pointed out that the categories should be more specific to the variables of critical thinking and speaking skills in order to better suit with the study. From the expert's comments, revisions have been made to the DIFLE rubric. Originally, as aforementioned, the DIFLE rubric consist of generic items, such as "Information". The new revisions in this case includes more specific items, such as "*Case Construction*", "*Argument Constructio*n" and "*Refutation*", which are items that are better suited for the study, as such items have been reviewed by the study in order for the rubric to be more suitable to this study.

Second, two experts have noted that there are some items that were irrelevant to this study, and should be removed in order to maintain consistency of the rubric in relation to this study. Some of the aforesaid items include "Respect for Other Team", where the experts commented its irrelevancy, stating that this item does not relate to neither critical thinking nor speaking ability. Thus, revisions were made in accordance

to the comments, and the irrelevant items ("Respect for Other Team" included) were removed from the DIFLE rubric in order to maintain consistency and quality of this study.

1.5.3 DIFLE Opinion Survey Questionnaire

Opinion survey questionnaire is conducted on students who participated in DIFLE to account for their opinion toward debate activity and teaching on critical thinking. The survey is administered at the end of the study after the posttest. The questionnaire consists of consists of 28 questions, each of which uses 5-point Likert-type scale to structure to items for the opinion (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly disagree). The 28 items are categorized into three groups: the overall impression of DIFLE, the opinion from the lessons, and the opinions on the variables. In the first group, the overall impression of DIFLE is presented under the title "Organization of Debate Instruction in Flipped Learning Environment", consisting of items regarding the general impression of the DIFLE course. The second group consists of three sub-groups, namely, Pre-debate Phase, Debate Delivery Phase, and Post Debate Phase. Each sub-categories consist of items that are specific to the designed lesson plans of DIFLE. For example, the Pre-Debate Phase item of "Introductory videos are effective tools to introduce the debating topic" is formed to evaluate the use of introductory videos (as well as other learning tools) before the actual debate delivery phase. The third group regarding the opinions on the variables consists of two sub-groups, namely, "Effects of DIFLE on Critical Thinking" and "Effects on DIFLE on Speaking Ability", designed to evaluate what and to what extent is DIFLE effective to the student's critical thinking and speaking ability. For instance, under "Effects of DIFLE on Critical Thinking", there are item that states "DIFLE has positive effects on my critical thinking", and under "Effects of DIFLE on Speaking Skills", the item presented includes "DIFLE has positive effects on my English speaking ability". The general concept of the opinion questionnaire is illustrated in Figure 5.

Figure 5: Opinion Survey Questionnaire Structure
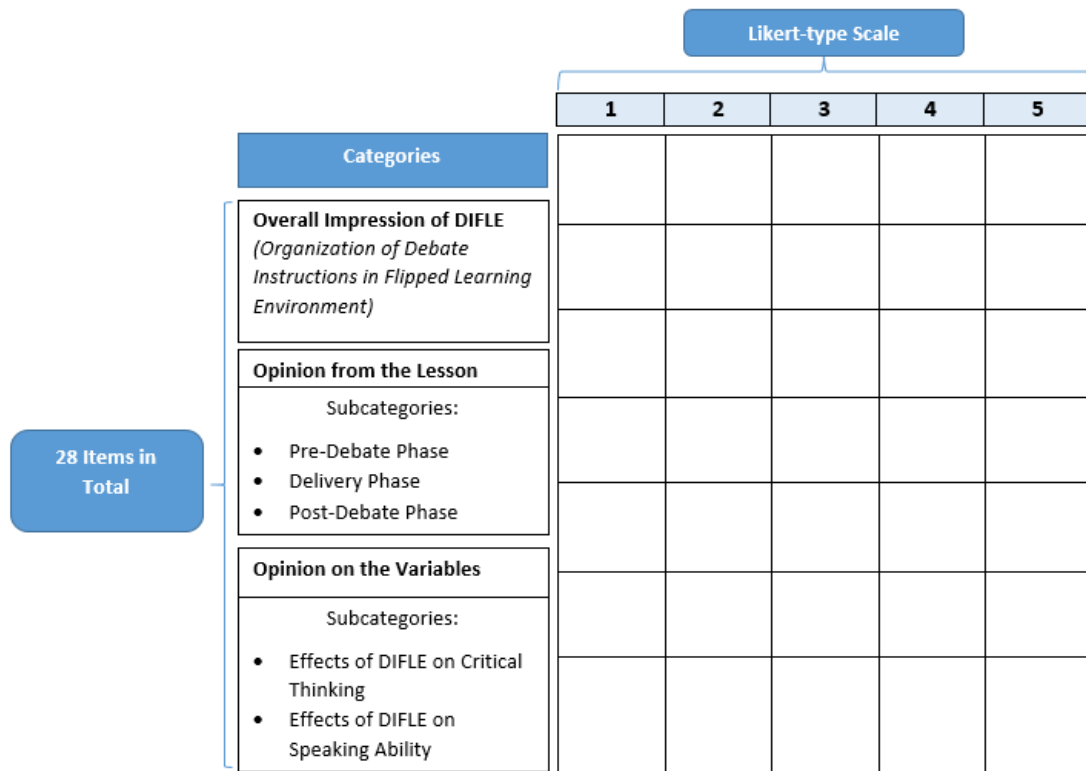
Stage 1.5.3.1: **Validation and Revision of the Opinion Survey Questionnaire**

1.5.4 Focus Group Interview

After the posttest, a focus group is created to interview students on their experience in DIFLE class. To ensure diversity of perspectives, 6 students were selected with 2 students chosen from the highest, lowest, and middle score bracket respectively. Questions are designed to engage participant in the discussion, let them explore the topic, and give them room to express their opinion on any particular aspect of DIFLE class and debate in general. The question design follows the guideline for conducting a focus group published by Duke University in 2005 to include engagement questions, exploration questions, and exit questions. The engagement questions prime the students for the topic ahead, such as "what was the most interesting topic in the whole course?" The exploration questions are questions targeted at a specific variable of the study, including DIFLE, critical thinking, and speaking ability. An example of an exploration question might be "What allowed you to learn to recognize claims?"; "were the videos

interesting or could get your attention?"; or "did you prefer this method or the conventional method of teaching critical thinking and speaking skill?". Lastly, exit question might ask "is there anything else you want to share about your experience in DIFLE course?" in order to make room for answers that might not fit with the question created by the researcher. A total of 13 main questions were asked. The researcher might add other questions to accommodate the flow of the focus group interview.

The engage and exit questions were used to allow students to freely associate with personal experience in DIFLE while the exploration questions asked students to elaborate on their experience regarding specific aspect of DIFLE. The answers to this part of the questionnaire were coded and categorized in accordance the scheme by Liaw (2007). The components to the answers of the focus group's questions consist of affective, cognitive, and behavioral capability. A full list of the focus group questions and its type are presented in Table 12.

Table 14: List of questions used focus group

Type of Questions	Sample questions
Engage questions	1. What was the most interesting topic in DIFLE?
	2. What is the difference between you experience in DIFLE and other classes?
DIFLE	3. What do you think about flipped learning environment
	4. What do you think about debate instruction?
	5. Were the videos interesting or could get your attention?
	6. Did you Flipped Learning could replace traditional style teaching? And why?
	7. Do you think online videos provided in DIFLE help improve your critical thinking?
Critical Thinking	8. In what way do you think DIFLE help increase you critical thinking?
	9. In what way do you think DIFLE help you create your own argument?
	10. In what way do you think DIFLE help you refute another person's argument?
English Speaking Ability	11. In what way do you think DIFLE help increase you English speaking ability?
	12. In what way do you think DIFLE help you in English oral communication?
Exit questions	13. Is there anything else you want to share about your experience in DIFLE course?"

Stage 1.5.4.1: Validation and Revision of the Focus Group Questions

Upon the completion in designing the Focus Group Questions, it was sent to three experts to evaluate by way of validation under the Item Object Congruence Index, and revision. The value of IOC ranges from -1 to +1 and were the average of the scores given by experts. The item which were scored higher than 0.5 would be considered valid and accepted as being congruent with the objective, while the item which scored lower than 0.5 would be considered incongruent and thus were subject to revision.

According to the IOC Index results, the total mean score of the IOC of the Focus Group Questions is 0.849, possibly indicating that the test is suitable. The scores for the majority of the items range from 0.860 – 1.000, which suggests that these items are suitable. After the validation process, the Focus Group Questions was adjusted based on the expert's suggestions before being employed in the main study. However, according to several academic experts, certain items were subjected to modification. The details of the revision for the Focus Group Questions are presented below.

Although there are not much incongruences in the Focus Group Questions, three experts have uniformly commented that certain sample questions in Focus Group Questions were not specific enough, and does not effectively evaluate student's critical thinking and speaking ability. For instance, one of the sample questions reads "What was the most interesting topic in DIFLE?" The experts suggests to change the wordings of the questions in order to be more critical and specific. In this case, they have suggested that the question should be changed to "In what way do you think DIFLE increased your critical thinking ability?" Furthermore, the experts have also suggested that each sample questions should include a follow-up question, such as "why" in order to enhance the critical thinking and speaking ability of the students. Thus, in accordance to these comments, changes were made to all sample questions in the same manner. For example, the old sample question reads

Original Version

"*What was the most interesting topic in DIFLE?"*

Revised Version:

"*In what way do you think DIFLE increased your critical thinking ability? Why?"*

Stage 1.6: Pilot study

A pilot study was conducted in order to confirm the effectiveness of the lesson plan and the research instruments that would be implemented in the Debate Instruction in Flipped Learning Environment. The sample for the pilot study were six Thai high school students from Materdei and Triam Udom Suksa School with at least 2 years of experience of formal education in English or bilingual program who have enrolled in Kev's Academy institute. The pilot students were a group of students with similar ability to the sample in this study. The period of the pilot study lasted three weeks where the first unit was assigned on the topic of social justice. This ensured that pilot students participated in one full cycle debate which went through the predebate, debate delivery and postdebate phase.

Specifically, in the predebate phase of the pilot study, the pilot students were assigned with video clips regarding the specific lesson topics prior to each class, and were expected to answer questions in relation to those video clips. For instance, for the first class which relates to making arguments and the uses of strategic language, pilot students are expected to watch video clips relating to social justice and how to make arguments, then complete questions online, such as "Create one argument as to why the death penalty should be legalized". Each class consists of different out of class online materials prior to the commencement of the lessons.

The debate delivery phase takes place in class, where the pilot students were involved with in-class activities and participation in relation with the topic of each lesson. For instance, pilot students were engaged with activities that relates to constructing cases in the second lesson, such as argumentation development and evaluation. These sessions were to prepare and equip the pilot students with the necessary skills and knowledge for an actual debate speech delivery. In the last class,

each pilot student were instructed to deliver an actual debate speech in accordance to what they have learnt in this pilot period.

Finally, in the postdebate phase, the teacher led the postdebate discussion for the whole class, and asked various questions regarding the debate, as well as the reasons for awarding one side as the winning team. For instance, the question included on whether the speakers have fulfilled their speaker roles and the reasons that the pilot students use to reach certain conclusion. Lastly, the teacher provides his own opinion as to who won the debate, and the reason that the teacher finds to be the decisive factor for that decision.

The pilot study of the lesson plan was carried out to test the suitability of the lesson plan both in terms of activity type, time allocation, and access to online resources. The pretest and the posttest were piloted to test the appropriateness of the test in terms of difficulty of the tasks, and time allocation. The questionnaire was piloted at the end of the pilot stage to check for any ambiguity of the Likert statements and open-ended questions.

Stage 1.7: Revision after Pilot Study

The 3-week pilot study carried out revealed a few potential problems that needed adjustments. Firstly, student's timing may at times be unpredictable as there may be other errands or unexpected situations that would prevent their presence or punctuality. The execution of the main study was extended by 30 minutes for any cushion time in case of unexpected situations. Secondly, several worksheets used in the lessons proved to be lacking engagements as students prefer not to share their answers. A class discussion per item were conducted in the main study to prevent this situation. Finally, students were not informed that they could take down notes when giving their speeches during the pre and posttest. In addition, the timing of each section was not specified on each section. Adjustments and clearer instructions have been made to present clearer instructions in the pre and post-test.

Phase 2: Implementation of the Debate Instruction in Flipped Learning Environment

Stage 2.1: Pretest the English speaking ability and critical thinking

Students participated in DIFLE were subject to pretest and posttest at the beginning and after finishing the program. The purpose of the present study was to measure the effects of DIFLE on English speaking ability and critical thinking of Thai high school students, thus two distinct tests were employed to separately measure English speaking ability and critical thinking.

In the pretest for English speaking ability, each student was subjected to individual speaking tasks that involved producing academic level speeches on a chosen controversial topic where debate could be found. The purpose was particularly to evaluate student's ability in speaking fluency and speaking strategies. The topic of the pretest was on a policy to ban animal testing while the topic of the posttest was on a motion to ban school uniform. Four speaking tasks were found in the test: first, *impromptu speech* required student to answer questions unrehearsed on the topic. This was intended to introduce the student to the topic of the test. As from the second to the forth task the student need some background knowledge of the topic, the research provided a passage that gives background on the facts and overview of positions taken by diverse groups of people regarding the topic. In each of the following tasks, students were given three minutes to prepare before giving a speech. After reading the passage, the second speaking task required students to *identify the strengths and weaknesses of the arguments* presented by different sides in the debate. The third task required student to *identify focal and peripheral ideas*, that is to point out main arguments and the supporting points for that claim. The forth task required student to roleplay as the Prime Minister of Thailand in support of the policy. All students' performance in the pretest and posttest were evaluated using the DIFLE rubric to evaluate students' English speaking ability, particularly on fluency, pronunciation and intonation, uses of language strategic tools and the ability to present hierarchical relationships between ideas. In the posttest, the test process was repeated but the topic was changed to the ban on school uniform.

In the pretest for critical thinking, the students were required to sit a Watson-Glaser Critical Thinking Appraisal (WGCTA), an exam designed to evaluate the critical thinking ability. The test consisted of five parts that corresponded to features of critical thinking, including ability to make inference, recognize assumption, use deduction, interpret information, and analyze arguments.

Stage 2.2: Conduct the Debate Instruction in Flipped Learning Environment and evaluate students' performance in English speaking ability and critical thinking after each debate session

Students were required to follow the 9 sessions of DIFLE as planned in the preparation phase, which include three cycles of predebate, debate delivery, and postdebate phase. The lessons are conducted mainly in two parts, online (out-of-class) and in-class activity. The out-of-class videos takes places in the pre-debate phase, while the debate delivery and postdebate phase belongs to in-class activities. Students are responsible for their commitment in the first part of the class. In total, each student engaged in three debate sessions throughout the 9 session program. The performance of each student was evaluated using DIFLE rubric for both the critical thinking and speaking ability, and the data were systemically collected for every debate session.

Stage 2.3: Posttest the English speaking ability and critical thinking and administer the survey of students' opinion toward the instruction model

Posttest in the same form of pretest was done again individually between student and instructor. Furthermore, the survey questions were used to measure the opinions toward DIFLE course and their opinions toward the concept and practice of speaking skill and critical thinking.

Stage 2.4: Data analysis

Data collected through during the implementation phase, including the pretest, the posttest, were used to analyze the statistical significance the changes in score after having participated in DIFLE. Both qualitative and quantitative method were used to answer the research questions on the effects of DIFLE and the participants' opinions towards it.

As for the quantitative analysis of the pretest-posttest comparison, the researcher used the nonparametric analysis, or sometimes called distribution-free tests, to perform statistical analysis on data which do not satisfied the assumptions of parametric model. Because of the small number of students participating in DIFLE and the non-normal data distribution, the study used nonparametric analysis as a statistical tool to analyze the median difference between the pretest and posttest in DIFLE. The model of the nonparametric analysis was Wilcoxon Signed-Ranks Test, which was used to compare within-group paired samples against the median and were considered a nonparametric counterpart to the paired t-test.

The quantitative analysis of the 5-point Likert scale opinion survey questionnaire, the research used descriptive analysis to analyze opinion students hold towards different aspects of DIFLE.

The qualitative analysis was conducted on the student's answer in open questions of the questionnaire and the focus group interview. Two inter-raters were used to ascertain the reliability of the results. The words grouped and explained to understand the perspective on aspects other than those mentioned in the questionnaire and provided personal experience of learners in DIFLE.

3.5 Research Instruments

The research instruments used to assess students' performance in this study consists of speaking tasks in the pre and posttest, Watson Glaser Critical Thinking Appraisal in the pre and posttest, DIFLE Rubric, opinion questionnaire, and focus group questionnaire. At the beginning of the course implementing debate instruction using flipped classroom, students in the research sample group have to do pretest in order to measure student's level of speaking ability and critical thinking prior to the instruction.

The course proceeds through 9 sessions divided into 3 units, where each student takes turn to play roles of debater and debriefer until every student have debated for each unit. After each debate session, instructor then evaluate and score debaters according to their performance in language and critical thinking ability. After learning through this model of study, students have to do posttest to assess the progress made as a result of the course as it will be compared to the pretest and debate scores.

Each variable under questions of this study require different research instrument to assess, measure, and analyze. The researcher uses both the quantitative and qualitative method to assess the effect of Debate Instruction in Flipped Learning Environment on speaking ability and critical thinking.

3.5.1 Pretest and Posttest

The pretest and posttest consists of two parts: Speaking tasks and the Watson Glaser Critical Thinking Appraisal Test. Students were required to perform both tasks before and after the main study.

3.5.1.1 Speaking Tasks for the Pretest and Post Test

The speaking pretest and posttest consisted of four tasks, including impromptu speech, identification of strength and weakness of arguments, identification of focal and peripheral point, and role playing. Since the impromptu speech was the first task and required that student give speech without any time to prepare, students were not required to read the background. For second to forth task, students were required to perform harder tasks and thus needed the background of the topic.

3.5.1.2 Watson-Glaser Critical Thinking Appraisal (WGCTA)

Watson - Glaser Critical Thinking Appraisal (WGCTA) was a standardized test for critical thinking. The WGCTA consisted of items of five classification of Critical Thinking skills and is designed to test different aspects of critical thinking, including inference, recognizing assumptions, deduction, interpretation, and evaluating assumptions (Bernard et al., 2008). The test was used to avoid bias that may arise from using the DIFLE rubric alone to test the critical thinking score. It was to ensure that the

critical thinking ability gained after participating in DIFLE were able to transfer to critical thinking ability in general and not specific to debate skill.

These aspects of critical thinking in WGCTA coincides with the critical thinking skills that the DIFLE course intended to enhance, either explicitly or implicitly. the Watson Glaser Critical Thinking Appraisal (Chartrand et al., 2013)have updated the model where critical thinking can be organized into, as well as a method to view and apply critical thinking principles, known as the "RED Model". As one of the most widely-used assessment model of critical thinking, it is divided into three factors, namely, recognize assumptions, evaluate arguments and draw conclusions. Various points in the aforementioned factors parallels with Fisher's (2001) and Diane Halpern's (1994) categorization of critical thinking skills.

Firstly, the factor of "recognize assumption" conveys one's ability to distinguish between fact and opinion. This implies the ability to notice and question the information presented in front, and not assume such information immediately upon receipt. Thus, when assumptions are questioned with different perspective by different people, the information will be viewed in a richer perspective. Some of Fisher's (2001) list of fundamental critical thinking skills mirrors "recognize assumptions", for instance, the task to "identify and evaluate assumptions". Secondly, the factor of "evaluate arguments" describes the ability to analyze the given information and argument objectively, which involves the constant questioning of the legitimacy of the supporting authorities and evidence, as well as the awareness of how emotions may influence the information. The main obstacle to this factor would involve personal bias, where one's perspective or emotions may cloud their evaluation of an argument. Thus, remaining objective is the key to drawing more accurate conclusions. In this respect, Fisher's (2001) list of fundamental critical thinking skills, including "judge the acceptability, especially the credibility, of claims" and "evaluate arguments of different kinds" provides for sharp similarities between the RED model and Fisher's (2001) list. Furthermore, under "Argument Analysis Skills" in Diane Halpern's (1994) categorization of critical thinking skill consist of "judging the credibility of an information source" also clearly mirrors that of the "evaluate arguments" of the RED Model. Lastly, the factor of "drawing conclusions" depicts an individual's ability to bring various different information together and arrive at a conclusion in such a way

that it logically flows with all the given evidence, and does not misdirect the conclusions beyond what is presented in the evidence. Thus, a good conclusion is normally described as "good judgment", as they generally arrive at a quality decision. Such factor mirrors that of Fisher's (2001) "draw inference", " identify the elements in a reasoned case, especially reasons and conclusions" and Diane Halpern's (1994) list which states "seeking converging evidence to increase confidence in a conclusion". Both of these studies echoes the factor of "drawing conclusions" of the RED Model.

However, a study done by Bernard et al. (2008) proposes that WGCTA should be considered a test for general critical thinking skills since all of the aspects had high level of correlations and should not be considered separately.

Various study has put WGCTA under scrutiny and its results are widely published (for example, Bernard et al. 2008; Wilson and Wagner 1981; Simon and Ward 1974) The WGCTA has been validated by the other studies, for example, a study done by El Hassan and Madhum (2007) through investigation of reliability and validity on 273 private university students, and Gadzella et al. (2006) on 565 psychology students.

3.5.2 DIFLE Rubric

The DIFLE Rubric is a 5-point scale developed to measure the student's performance throughout the DIFLE course and is pervasively used to quantify the result of the study. The rubric is designed to measure three different variables: students' understanding through flipped environment, speaking ability, and critical thinking.

Rubric consists of three parts which are designed to measure different skills of critical thinking and speaking ability. Rubric was used to evaluate students' individual speaking task and debate delivery phase.

As for the part of critical thinking skills, the DIFLE Rubric measures construction of case, argument construction, refutation, and use of information. Case Construction uses the quality of the definition of problems and terms, their fairness, and their consistency with the proposed solution to as criteria for measurement. Argument Construction uses quality of argumentation, indicating how tightly-supported the arguments were make, as criteria. The measurement of Refutation uses the quality of

counter-argument as criteria, depending on the strength and relevance of the counter-arguments. For Use of Information, the quality of information presented in the debate, whether they are accurate and relevant, was used as criteria.

Measurements in Speaking Ability parts consist of Speaking Fluency and Speaking Strategies. Higher score in Speaking Fluency indicates a fluent speech without hesitation or pronunciation mistakes. Higher score in Speaking Strategies shows an effective use of speaking strategies such as signposts, connectors, and paraphrasing to emphasize relations between ideas in the debate.

The summary of criteria for each measurement in DIFLE Rubric are presented in Table 13, while the full 5-point DIFLE Rubric scale in presented in Instruction Plan Development.

Table 15: Summary of DIFLE Rubric and the criteria used for each measurement

Measurement	Criteria of measurement
Critical Thinking	
Case Construction	Recognizing Assumptions
Argument Construction	Evaluating Arguments
Refutation	Evaluating Arguments / Drawing Conclusions
Use of Information	Drawing Conclusions
Speaking Ability	
Speech flow	Micro Skills: Speaking Fluency
Pronunciation and intonation	Micro Skills: Speaking Fluency
Use of signposts	Macro Skills: Speaking Strategies
Emphasis of ideas	Macro Skills: Speaking Strategies

3.5.3 Opinion Questionnaire

Opinion survey questionnaire is conducted on students who participated in DIFLE to account for their opinion toward debate activity and teaching on critical thinking. The survey is administered at the end of the study after the posttest. The questionnaire consists of consists of 35 questions, each of which uses 5-point Likert-type scale to structure to items for the opinion to which students must give their rate agreement using the following scales:

5	means	strongly agree
4	means	agree
3	means	neutral
2	means	disagree
1	means	strongly disagree

The obtained average scores of the first part were interpreted using the following criteria:

4.50 – 5.00	means	the students reported that their opinion toward DIFLE is at "strongly agree" level
3.50 – 4.49	means	the students reported that their opinion toward DIFLE is at "agree" level
2.50 – 3.49	means	the students reported that their opinion toward DIFLE is at "neutral" level
1.50 – 2.49	means	the students reported that their opinion toward DIFLE is at "disagree" level
1.00 – 1.49	means	the students reported that their opinion toward DIFLE is at "strongly disagree" level

3.5.4 Focus Group Interview

After finish DIFLE, focus group interview was conducted 6 students selected with 2 students chosen from the highest, lowest, and middle score bracket respectively in order to gain in-depth perspective from the participants.

The questions for the focus group interview were grouped into 5 part ordered as follows: 1) engage questions; 2) DIFLE; 3) Critical thinking; 4) English speaking ability; and 5) exit questions. The engage and exit questions were used to allow students to free associate with personal experience in DIFLE while the second to forth group asked students to elaborate on their experience regarding specific aspect of DIFLE.

Table 14 shows a set of questions that would be used in focus group.

Table 16: List of questions used focus group

Type of Questions	Sample questions
Engage questions	1. What was the most interesting topic in DIFLE?
	2. What is the difference between you experience in DIFLE and other classes?
DIFLE	3. What do you think about flipped learning environment
	4. What do you think about debate instruction?
	Follow up questions on each elements including: Introduction, rebuttal, arguments, and case
	5. Were the videos interesting or could get your attention?
	6. Did you Flipped Learning could replace traditional style teaching? And why?
	7. Do you think online videos provided in DIFLE help improve your critical thinking?
Critical Thinking	8. In what way do you think DIFLE help increase you critical thinking?
	9. In what way do you think DIFLE help you create your own argument?
	10. In what way do you think DIFLE help you refute another person's argument?
English Speaking Ability	11. In what way do you think DIFLE help increase you English speaking ability?
	12. In what way do you think DIFLE help you in English oral communication?
Exit questions	13. Is there anything else you want to share about your experience in DIFLE course?"

The questions in the opinion survey was evaluated by three experts to determine the validity and reliability of the questions in terms of proper contents and directions. The three experts was asked to evaluate the questionnaire by using the Item-Objective Congruence (IOC). The median score of IOC of the responses from the experts determined whether the question should be accepted or revised.

3.6 Data Collection

Data Collection. Data were collected by research instruments including pretest, posttest, and opinion questionnaires for different variables, while these collected data were analyzed through statistical analytic instruments and content analysis. Before the study, speaking scores of the pretest and Watson Glaser Critical Thinking Appraisal scores from the pretest were collected. After the 9-lesson study, speaking scores of the pretest and Watson Glaser Critical Thinking Appraisal scores of the posttest were collected. Opinion questionnaires were administered and data were collected at the end of the study after the posttest. Focus group participants were gathered and the focus group interview was conducted after the participants have filled in their opinion survey. Data from the focus group were collected for content analysis.

3.7 Data Analysis

Non-parametric test was used to analysis the statistical significance of the intervention using the before-and-after observation and collected data. The nonparametric analysis, or sometimes called distribution-free tests, are used to perform statistical analysis on data which do not satisfied the assumptions of parametric model. As opposed to parametric analysis which assumed specific probability distribution of data (for example, normal distribution) and involved estimation of key parameters of the distribution, the nonparametric does not hold these assumptions. Because of the small number of students participating in DIFLE and the non-normal data distribution, the study used nonparametric analysis as a statistical tool to analyze the median difference between the pretest and posttest in DIFLE.

To this end, the data collected from DIFLE Rubric and Watson - Glaser Critical Thinking Appraisal were analyzed using a type of nonparametric analysis named the Wilcoxon Signed-Ranks Test, which was used to compare within-group paired samples against the median and were considered a nonparametric counterpart to the paired t-test.

The study employed a mixed-research method of both qualitative and quantitative data. The quantitative data consisted of students' scores from the pretest, posttest, and opinion questionnaire, whereas the qualitative data came from the focus

group questions. Data analysis according to each research questions is discussed in the following sections:

Research Question 1.1: What are the effects of Debate Instruction in Flipped Learning Environment on Thai High School Student's English speaking ability?

Data from research question 1.1 was obtained from the pretest and posttest scores assessed by the DIFLE rubric. The scores were analyzed through the Wilcoxon's Signed rank test. The two inter-raters ascertained the reliability of the results. The inter-rater reliability was tested using Pearson Correlation Coefficient.

Research Question 1.2: What are the effects of Debate Instruction in Flipped Learning Environment on Thai High School Student's critical thinking?

Data from research question 1.2 was obtained from the pretest and posttest scores assessed by the DIFLE rubric. The test administered was the Watson Glaser Critical Thinking Appraisal. The scores were analyzed through the Wilcoxon's Signed rank test.

The two inter-raters ascertained the reliability of the results. The inter-rater reliability was tested using Pearson Correlation Coefficient.

Research Question 2: What are the opinions of high school students towards learning debate using flipped classroom?

Quantitative data was drawn from the questionnaire scores which are used to calculate the mean score. In addition, qualitative data was drawn from the focus group interview questions. The answers were coded and analyzed. Students' opinion obtained through open-ended question and focus group interview were analyzed using *Opinion analysis grid* developed from the study done by Triandis (1997), Liaw (2002), and Jain (2014) that divide students opinion into three components, which are affective, cognitive and behavioral components. The two inter-raters ascertained the reliability of the coding and analysis.

Furthermore, since opinion are general perception an individual hold toward something, there should be a division between the positive and negative factors to each component. The grid employed in the analysis and its coding scheme is as follow:

Table 17: Summary of Coding Schemes

Components	Positive	Negative
Learning environment	PLE	NLE
Affective	PA	NA
Cognitive	PC	NC
Behavioral	PB	NB

Table 18: Summary of Research Instruments used for data collection for each variable

Research Questions	Research Instruments	Analysis
1. What are the effects of Debate Instruction in Flipped Learning Environment on Thai High School Student's English speaking ability?	1) DIFLE Rubric	1) Wilcoxon Signed-Ranks Test
2. What are the effects of Debate Instruction in Flipped Learning Environment on Thai High School Student's critical thinking?	1) Watson - Glaser Critical Thinking Appraisal 2) DIFLE Rubric	1) Wilcoxon Signed-Ranks Test
3. What are the opinions of high school students towards learning debate using flipped classroom?	1) Opinion Survey Questionnaire 2) Focus group questions	1) Descriptive analysis 2) Content analysis

3.8 Summary

The aim of this research is to investigate the extent to which DIFLE could enhance students' speaking and critical thinking ability, the effectiveness of the course, and the opinions of students toward this particular teaching instruction. As such, this research employed a purposive sampling method, which used both the quantitative and qualitative analysis to answer the research questions on the effects of DIFLE on Thai high school students' English speaking ability and critical thinking and their opinion towards DIFLE. The research methodology was designed to answer all three research questions using pretest and posttest scores difference of the individual speaking task and Watson-Glaser Critical Thinking Appraisal. Questionnaire of Likert scale and open-ended questions and focus group interview were employed to obtain data regarding students' opinion toward DIFLE. The key research tools employed to evaluate students' English speaking ability and critical thinking in this research were pretest-posttest median differences using Watson-Glaser test, speaking tasks, opinion survey questionnaire, DIFLE rubric and focus group interview questions.

The collected data were analyzed through qualitative method of nonparametric analysis, specifically the Wilcoxon Sign-Ranks Test, to determine the statistical significance of the findings. For analysis of opinion, descriptive statistics was conducted on Likert scale while content analysis was conducted on open-ended questions and focus group interview responses using the framework of opinion grid to evaluate the positive and negative opinion toward DIFLE through the component of Learning Environment, Affective component, Cognitive component, and Behavioral component. The keywords were grouped and explained to understand the perspective on aspects other than those mentioned in the questionnaire and provided personal experience of learners in DIFLE.

Chapter IV
FINDINGS

4.1 Introduction

This chapter reports the finding of the current study regarding the effects of Debate Instruction on Flipped Learning Environment (DIFLE) on Thai high school students in enhancing English speaking skills and Critical Thinking.

The first part of this chapter examines the effect of DIFLE on learners' English speaking ability. In order to answer research question one, analysis of the pretest and the posttest scores were presented.

The second part of the chapter shows the effects of DIFLE on learner's critical thinking ability. Analysis of the pretest and the posttest scores are presented to answer research question two.

The third part of the chapter presents findings on the opinion of students towards learning in DIFLE. The quantitative and qualitative analysis of the data obtained from questionnaire and focus group was presented to answer research question three.

Finally, the forth part presents the additional findings form the quantitative data from the debate sessions performed in the debate delivery phase and the correlation between English speaking ability and critical thinking. The results of the study and their relation to the research questions were explained as follow.

4.2 The effects of DIFLE on learner's English speaking ability

Research Question 1.1: What are the effects of Debate Instruction in Flipped Learning Environment on Thai High School Student's English speaking ability?

Hypothesis 1: After having engaged in the treatment, students will achieve higher scores in the posttest tasks of English Speaking Ability than in the pretest.

4.2.1 Results from the comparison of the pretest and the posttest scores of English speaking ability

English speaking ability

In order to obtain data that answer the first research question of DIFLE, students were subjected to pretest before the implementation and posttest after the implementation of the DIFLE. The tasks was evaluated using a speaking rubric which was developed specifically to DIFLE to evaluate the speaking fluency and speaking strategies.

The effects of DIFLE on students speaking ability were measured using descriptive statistics. As the sample size was small (N=24) and violated the assumption of normal distribution, the non-parametric statistical tool was used to evaluate the statistical significance of the changes in students' English speaking ability after having participated in DIFLE. The study used the Wilcoxon Signed-rank test as an alternative to paired-sample t-test. The descriptive statistics of the results is presented as follow:

4.2.1.1 The Overall Test

Descriptive statistics showed a comparison between a pretest and a posttest speaking score in the individual speaking tasks. There is a difference in the scores of the pretest (Mean=11.208, SD=2.750, Min = 6, Max = 17) and the posttest (Mean=16.083, SD=2.357, Min = 11, Max = 20).

Table 19: Descriptive statistics of English speaking ability pretest and posttest

	Mean	SD	Minimum	Maximum
Pretest	11.208	2.75	6	17
Posttest	16.083	2.357	11	20

N = 24

Table 20: The Wilcoxon Signed-Ranks Test on the pretest and posttest score of English speaking ability

	N	Mean Rank	Sum of Ranks
Negative Ranks	1	2.5	2.5
Positive Ranks	21	11.93	250.5
Ties	2		
Total	24		

Z = -4.043; Sig (2-tailed) = .000

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference.

Table 20 showed that of all 24 students participated in the pretest and the posttest, 21 of students gained higher scores in the post test, 2 students gain the same scores, and 1 student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of English speaking ability with Z value of -4.043 and at the significance level of 0.000. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a significant difference between the pretest and posttest scores.

The speaking ability can be further categorized in to 2 components: speaking fluency and speaking strategies, each further divided in to 2 more components. The components of speaking fluency are speech flow and pronunciation. Speech fluency measures the fluency of the speech, while speech pronunciation measures the accuracy of pronunciation and intonation of speech. The components of speaking strategies compose of signpost and emphasis of ideas.

4.2.1.2 Effects on speaking fluency
4.2.1.2.1 Speaking fluency: speech flow

Table 21: The Wilcoxon Signed-Ranks Test on the pretest and posttest scores of English speaking ability regarding speech flow

	N	Mean Rank	Sum of Ranks
Negative Ranks	3	6.5	19.5
Positive Ranks	18	11.75	211.5
Ties	3		
Total	24		

Z = -3.371; Sig (2-tailed) = .001

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference on students' speaking fluency regarding the speech flow. Table 22 showed that of all 24 students participated in the pretest and the posttest, 18 of students gained higher scores in the post test, 3 students gain the same scores, and 3 student gained lower scores.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of speaking fluency regarding the speech flow with Z value of -3.371 and at the significance level of 0.001.

4.2.1.2.2 Speaking fluency: pronunciation

Table 22: The Wilcoxon Signed-Ranks Test on the pretest and posttest scores of English speaking ability regarding speech pronunciation

	N	Mean Rank	Sum of Ranks
Negative Ranks	3	10.5	31.5
Positive Ranks	18	11.08	199.5
Ties	3		
Total	24		

Z = -2.951; Sig (2-tailed) = .003

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference on students' speaking fluency regarding pronunciation. Table 24 showed that of all 24 students participated in DIFLE pretest and posttest, 18 of students gained higher scores in the post test, 3 students gain the same scores, and 3 student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of English speaking ability with Z value of -2.951 and at the significance level of 0.03.

4.2.1.3 Effects on speaking strategies

4.2.1.3.1 Speaking strategies: use of signposts

Table 23: The Wilcoxon Signed-Ranks Test on the pretest and posttest scores of English speaking ability regarding use of signposts

	N	Mean Rank	Sum of Ranks
Negative Ranks	7	9.79	68.5
Positive Ranks	16	12.97	207.5
Ties	1		
Total	24		

Z = -2.132; Sig (2-tailed) = .033

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference on students' speaking fluency regarding use of signposts. Table 26 showed that of all 24 students participated in DIFLE pretest and posttest, 16 of students gained higher scores in the post test, 1 students gain the same scores, and 7 student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of English speaking ability with Z value of -2.132 and at the significance level of 0.033.

4.2.1.3.2 Speaking strategies: emphasis of ideas

Table 24: The Wilcoxon Signed-Ranks Test on the pretest and posttest scores of
English speaking ability regarding emphasis of ideas

	N	Mean Rank	Sum of Ranks
Negative Ranks	5	7.5	37.5
Positive Ranks	14	10.89	152.5
Ties	5		
Total	24		

$Z = -2.431$; Sig (2-tailed) $=.015$

A Wilcoxon Signed-Ranks Test was conducted to compare the median
difference on students' speaking fluency regarding the emphasis of ideas. Table 28
showed that of all 24 students participated in DIFLE pretest and posttest, 14 of students
gained higher scores in the post test, 5 students gain the same scores, and 5 student
gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher
than pretest scores of English speaking ability with Z value of -2.431 and at the
significance level of 0.015.

To conclude, English speaking ability of students in the pretest and posttest
using isolated individual speaking tasks was enhanced in all four aspects of speaking
ability. The statistical analysis showed a significant increase in scores between the
pretest and posttest of the students participating in DIFLE. Therefore, the first
hypothesis that student gain that higher score after participated in DIFLE was accepted.

4.3 The effects of DIFLE on learner's critical thinking

*Research Question 1.2: What are the effects of Debate Instruction in Flipped
Learning Environment on Thai High School Student's critical thinking?*

*Hypothesis 2: After having engaged in the treatment, students will achieve
higher scores in the posttest tasks of critical thinking than in the pretest.*

4.3.1 Results from the comparison of the pretest and the posttest scores of critical thinking skills

In order to obtain data that answer the second research question of DIFLE, students were subjected to pretest before the implementation and posttest after the implementation of the DIFLE. The students were required to sit a Watson-Glaser test to quantify the critical thinking ability. The test consists of 5 sections each with different focus on aspects of critical thinking: 1) inference, 2) recognition of assumptions, 3) deduction, 4) interpretation and 5) evaluation of arguments. The descriptive statistics was used to show difference between the pretest and posttest scores, and the Wilcoxon Signed-Ranks Test was used to measure the statistical significance of the scores difference. The overall test scores are presented first and is followed by results of each section of the test.

4.3.1.1 The overall test

Descriptive statistics showed a comparison between a pretest and a posttest critical thinking score in the Watson-Glaser test. There is a difference in the scores of the pretest (Mean=17.916, SD=5.241, Min = 8, Max = 28) and the posttest (Mean=26,125, SD=3.442, Min = 19, Max = 32).

Table 25: Descriptive statistics of the overall scores of critical thinking in pretest and posttest

	Mean	SD	Minimum	Maximum
Pretest	17.916	5.241	8	28
Posttest	26.125	3.442	19	32

N=24

Table 26: The Wilcoxon Signed-Ranks Test of the overall scores of critical thinking in pretest and posttest

	N	Mean Rank	Sum of Ranks
Negative Ranks		0	0
Positive Ranks	23	12	276
Ties	1		
Total	24		

$Z = -4.203$; Sig (2-tailed) = .000

A Wilcoxon Signed-Ranks Test was conducted to measure difference in median scores of the pretest and posttest. Table 30 showed that of all 24 students participated in DIFLE pretest and posttest, 23 of them gained higher scores in the posttest, 1 student gained the same scores, while none of the student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of critical thinking with Z value of -4.203 and at the significance level of 0.000. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a significant difference between the pretest and posttest scores.

The results of students' critical thinking ability can be further divided in to their inference skills, recognition of assumptions skills, deduction skills, interpretation skills, and evaluation of argument skills.

4.3.1.2 Critical thinking: inference

Inference is a conclusion based on evidence and reasoning, but not necessarily based on a guaranteed fact. In this regard, it enables conclusions to be drawn that are not explicitly stated. An inference question typically involves a statement (which is assumed to be true) and a number of inferences based on that statement. Thus, the typical responses to an inference question will have five options, they are definitely true, probably true, insufficient data to say whether or not it is true, probably false, or definitely false.

Table 27: The Wilcoxon Signed-Ranks Test on the pretest and posttest scores on inference

	N	Mean Rank	Sum of Ranks
Negative Ranks	6	7.25	43.5
Positive Ranks	16	13.09	209.5
Ties	2		
Total	24		

Z = -2.702; Sig (2-tailed) = .007

A Wilcoxon Signed-Ranks Test was conducted to measure difference in median scores of the pretest and posttest. Table 32 showed that of all 24 students participated in DIFLE pretest and posttest, 16 of them gained higher scores in the posttest, 2 students gained the same scores, while 6 of the student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of critical thinking regarding inference with Z value of -2.702 and at the significance level of 0.007.

4.3.1.3 Critical thinking: recognition of assumptions

Recognition of assumptions conveys one's ability to distinguish between fact and opinion. This implies the ability to notice and question the information presented in front, and not assume such information immediately upon receipt. Therefore, when assumptions are questioned with different perspective by different people, the information will, in itself, be viewed in a richer perspective.

Descriptive statistics showed a comparison between a pretest and a posttest critical thinking score in the Watson-Glaser test on students' ability to recognize arguments. There is a difference in the scores of the pretest (Mean=3.25, SD=2.44, Min = 1, Max = 8) and the posttest (Mean=5.25, SD=1.80, Min = 2, Max = 8).

Table 28: The Wilcoxon Signed-Ranks Test on the pretest and posttest scores on recognition of assumptions

	N	Mean Rank	Sum of Ranks
Negative Ranks	5	9.2	46
Positive Ranks	17	12.18	207
Ties	2		
Total	24		

Z = -2.624; Sig (2-tailed) = .009

A Wilcoxon Signed-Ranks Test was conducted to measure difference in median scores of the pretest and posttest. Table 34 showed that of all 24 students participated in DIFLE pretest and posttest, 17 of them gained higher scores in the posttest, 2 students gained the same scores, while 5 of the student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of critical thinking regarding recognition of assumptions with Z value of -2.624 and at the significance level of 0.009.

4.3.1.4 Critical thinking: deduction

Deduction is the drawing of conclusion in a particular instance, by referring to a general law or premise. Specifically, deduction questions include an assumed-truth statement, follow by a number of potential conclusions. Interpretation is the evaluation of whether a conclusion can logically follow from the information or evidence. Thus, the interpretation sector of critical thinking would require an individual to understand the precise meaning or significance of the information and applying this information appropriately.

Table 29: The Wilcoxon Signed-Ranks Test on the pretest and posttest scores on deduction

	N	Mean Rank	Sum of Ranks
Negative Ranks	4	8.88	35.5
Positive Ranks	18	12.08	217.5
Ties	2		
Total	24		

Z = -2.970; Sig (2-tailed) = .003

A Wilcoxon Signed-Ranks Test was conducted to measure difference in median scores of the pretest and posttest. Table 36 showed that of all 24 students participated in DIFLE pretest and posttest, 18 of them gained higher scores in the posttest, 2 students gained the same scores, while 4 of the students gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of critical thinking regarding deduction with Z value of -2.970 and at the significance level of 0.003.

4.3.1.5 Critical thinking: interpretation

An interpretation is an evaluation of whether a conclusion can logically follow from the information or evidence provided. This requires an individual to understand the precise meaning or significance of a piece of information and applying this information appropriately.

Table 30: The Wilcoxon Signed-Ranks Test on the pretest and posttest scores on interpretation

	N	Mean Rank	Sum of Ranks
Negative Ranks	4	10.25	41
Positive Ranks	17	11.18	190
Ties	3		
Total	24		

Z = -2.610; Sig (2-tailed) = .009

A Wilcoxon Signed-Ranks Test was conducted to measure difference in median scores of the pretest and posttest. Table 38 showed that of all 24 students participated in DIFLE pretest and posttest, 17 of them gained higher scores in the posttest, 3 students gained the same scores, while 4 of the student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of critical thinking on interpretation with Z value of -2.610 and at the significance level of 0.009.

4.3.1.6 Critical thinking: evaluation of arguments

Evaluation of arguments describes the ability to analyze the given information and argument objectively, which involves the constant questioning of the legitimacy of the supporting authorities and evidence, as well as the awareness of how emotions may influence that information. Usually, the main obstacle to this factor would include personal bias, where one's perspective or emotions my cloud their evaluation of an argument.

Table 31: The Wilcoxon Signed-Ranks Test on the pretest and posttest scores on analyzing arguments

	N	Mean Rank	Sum of Ranks
Negative Ranks	9	11.72	105.5
Positive Ranks	13	11.35	147.5
Ties	2		
Total	24		

Z = -0.687; Sig (2-tailed) = .492

A Wilcoxon Signed-Ranks Test was conducted to measure difference in median scores of the pretest and posttest. Table 40 showed that of all 24 students participated in DIFLE pretest and posttest, 13 of them gained higher scores in the posttest, 2 students gained the same scores, while 9 of the student gained lower scores in the posttest compared to pretest.

The test indicated that there was no statistical difference between the posttest and the pretest scores of critical thinking regarding the ability to evaluate arguments. (Z = -4.203, significance level = 0.492).

To conclude, the students in the pretest and posttest scores obtained through Watson-Glaser test showed that students' overall critical thinking was enhanced. However, a closer examination revealed that the scores of only four aspects of critical thinking has increased at a statistically significant level (i.e. inference, recognition of assumptions, deduction, and interpretation). On the other hand, difference in the pretest and the posttest scores on evaluation of arguments did not have statistical significance.

4.3.2 Results from the comparison of the pretest and the posttest scores of critical thinking skills of the DIFLE rubric

DIFLE Rubric

In addition to the Watson Glaser test that quantifies the students' critical thinking skills, students were also subjected to the DIFLE rubric on a formative assessment basis, which includes the pretest, posttest, as well as the nine lessons of the DIFLE program. The rubric consists of 4 sections each with a different focus on aspects on critical thinking: 1) case construction, 2) argument construction, 3) refutation, and 4) use of information. The descriptive statistics was used to show difference between the pretest and posttest scores, and the Wilcoxon Signed-Ranks Test was used to measure the statistical significance of the scores difference. The overall test scores are presented first and is followed by results of each section of the test.

4.3.2.1 The overall test

Descriptive statistics showed a comparison between a pretest and a posttest speaking score in the individual critical thinking skills. There is a difference in the scores of the pretest (Mean=11.5, SD=1889, Min = 6, Max = 14) and the posttest (Mean=14.75, SD=1.799, Min = 11, Max = 17).

Table 32: Descriptive statistics of critical thinking skills pretest and posttest

	Mean	SD	Minimum	Maximum
Pretest	11.5	1.889	6	11
Posttest	14.75	1.799	14	17

N = 24

Table 33: The Wilcoxon Signed-Ranks Test on the pretest and posttest score of critical thinking skills

	N	Mean Rank	Sum of Ranks
Negative Ranks	2	6.5	13
Positive Ranks	21	12.523	263
Ties	1		
Total	24		

Z = -3.801; Sig (2-tailed) = .05

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference. Table 42 showed that of all 24 students participated in the pretest and the posttest, 21 of students gained higher scores in the post test, 1 students gain the same scores, and 2 student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of critical thinking skills with Z value of -3.801 and at the significance level of 0.05. Therefore, there is a significant difference between the pretest and posttest scores.

4.3.2.2 Case Construction

Descriptive statistics showed a comparison between a pretest and a posttest critical thinking score in the critical thinking tasks. There is a difference in the scores of the pretest (Mean=2.875, SD=1.034, Min = 1 Max = 5) and the posttest (Mean=3.667, SD=0.868, Min = 2, Max = 5).

Table 34: Descriptive statistics of critical thinking skills pretest and posttest

	Mean	SD	Minimum	Maximum
Pretest	2.875	1.034	1	5
Posttest	3.667	0.868	2	5

N = 24

Table 35: The Wilcoxon Signed-Ranks Test on the pretest and posttest score of critical thinking skills

	N	Mean Rank	Sum of Ranks
Negative Ranks	1	28.5	28.5
Positive Ranks	20	10.125	202.5
Ties	3		
Total	24		

Z = -3.02; Sig (2-tailed) = .0.05

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference. Table 44 showed that of all 24 students participated in the pretest and the posttest, 20 of students gained higher scores in the post test, 3 students gain the same scores, and 1 student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of English speaking ability with Z value of -3.02 and at the significance level of 0.05. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a significant difference between the pretest and posttest scores.

4.3.2.3 Argument Construction

Descriptive statistics showed a comparison between a pretest and a posttest speaking score in the individual critical thinking tasks. There is a difference in the scores of the pretest (Mean=3.1667, SD=0.95, Min = 2, Max = 5) and the posttest (Mean=3.958, SD=1.239, Min = 2, Max = 5).

Table 36: Descriptive statistics of critical thinking skills pretest and posttest

	Mean	SD	Minimum	Maximum
Pretest	3.1667	0.95	2	5
Posttest	3.958	1.239	2	5

N = 24

Table 37: The Wilcoxon Signed-Ranks Test on the pretest and posttest score of critical thinking skills

	N	Mean Rank	Sum of Ranks
Negative Ranks	4	9.5	38
Positive Ranks	17	8.94	152
Ties	3		
Total	24		

Z = -2.293; Sig (2-tailed) = .05

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference.

Table 46 showed that of all 24 students participated in the pretest and the posttest, 17 of students gained higher scores in the post test, 3 students gain the same scores, and 1 student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of English speaking ability with Z value of -2.293 and at the significance level of 0.05. Therefore, is a significant difference between the pretest and posttest scores.

4.3.2.4 Refutation

Descriptive statistics showed a comparison between a pretest and a posttest critical thinking score in the individual critical thinking tasks. There is a difference in the scores of the pretest (Mean=2.667, SD=0.916, Min = 1 Max = 5) and the posttest (Mean=3.708, SD=0.907, Min = 2, Max = 5).

Table 38: Descriptive statistics of English speaking ability pretest and posttest

	Mean	**SD**	**Minimum**	**Maximum**
Pretest	2.667	0.916	1	5
Posttest	3.708	0.907	2	5

N = 24

Table 39: The Wilcoxon Signed-Ranks Test on the pretest and posttest score of critical thinking skills

	N	**Mean Rank**	**Sum of Ranks**
Negative Ranks	3	2	10
Positive Ranks	17	9.47	161
Ties	4		
Total	24		

Z = -3.288; Sig (2-tailed) = .05

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference.

Table 48 showed that of all 24 students participated in the pretest and the posttest, 17 of students gained higher scores in the post test, 4 students gain the same scores, and 3 student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of English speaking ability with Z value of -3.288 and at the significance level of 0.05. Therefore, there is a significant difference between the pretest and posttest scores.

4.3.2.5 Use of Information

Descriptive statistics showed a comparison between a pretest and a posttest critical thinking score in the individual critical thinking tasks. There is a difference in the scores of the pretest (Mean=11.208, SD=2.750, Min = 6, Max = 17) and the posttest (Mean=16.083, SD=2.357, Min = 11, Max = 20).

Table 40: Descriptive statistics of critical thinking skills pretest and posttest

	Mean	SD	Minimum	Maximum
Pretest	2.791	0.883	2	5
Posttest	3.416	0.928	2	5

N = 24

Table 41: Wilcoxon Signed-Ranks Test on the pretest and posttest score of critical thinking skills

	N	Mean Rank	Sum of Ranks
Negative Ranks	3	8.333	25
Positive Ranks	18	6.944	125
Ties	3		
Total	24		

Z = -2.295; Sig (2-tailed) = .05

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference.

Table 50 showed that of all 24 students participated in the pretest and the posttest, 21 of students gained higher scores in the post test, 3 students gain the same scores, and 3 student gained lower scores in the posttest compared to pretest.

The test indicated that the posttest scores was statistically significantly higher than pretest scores of English speaking ability with Z value of -2.295 and at the significance level of 0.05. Therefore, there is a significant difference between the pretest and posttest scores.

4.4 The learner's opinions towards DIFLE

Research Question 2: *What are the effects of Debate Instruction in Flipped Learning Environment on Thai High School Student's critical thinking?*

4.4.1 Results from Questionnaire

After having participated in the program, students were asked to give opinion on Debate Instruction in Flipped Learning Environment. The opinion survey consisted of two parts. Part one was a 28-item Likert 5-point scale intended to quantify the opinion of students on debate instruction. The 28 items are categorized into three groups: the overall impression of DIFLE, opinions on the speaking ability, and the opinions on the critical thinking skills. In the first group, the overall impression of DIFLE is presented under the title "Organization of Debate Instruction in Flipped Learning Environment", consisting of items regarding the general impression of the DIFLE course. The second group, the opinions on the speaking ability, consists of two sub-groups, namely, speaking fluency and speaking strategy. The third group, the opinions on critical thinking skills, consists of three sub-groups, namely recognize assumptions, evaluate arguments, and drawing conclusions. Part two was open-ended question which allowed students to share experience and give suggestions to the application of DIFLE in the future. The question design includes engagement questions, exploration questions, and exit questions.

4.4.1.1 Quantitative Analysis of Likert Score

In the first part the opinion survey consisted of 35 questions divided into 6 aspects of DIFLE: 1) The overall of DIFLE, 2) the effects of DIFLE on speaking fluency of English speaking ability 3) the effects of DIFLE on speaking strategy of English speaking ability 4) the effects of DIFLE on recognize assumptions of critical thinking ability 5) the effects of DIFLE on evaluate argument of critical thinking ability, and 6) the effects of DIFLE on drawing conclusions of critical thinking ability.

The mean score of the overall questionnaire was 4.34 (SD = 0.71). It indicated that students had positive opinion toward DIFLE. The following section reports the

findings from the questionnaire in accordance with the overall of DIFLE itself, the effects of DIFLE on English speaking ability and critical thinking, and its respective sub-elements.

4.4.1.1.1 Predebate phase: Independent research and Teaching content

Item 1-11 were constructed to investigate the student's the predebate phase of DIFLE and focus particularly on the independent research and teaching content. The findings were illustrated in Table 51.

Table 51: Predebate phase: Independent research and Teaching content

Questionnaire Items	Mean	SD
1. Online videos were *helpful to my independent research*	3.88	0.85
2. Introductory videos were *effective tools to help me understand* the topic	4.17	1.09
3. Lecture videos were effective tools to improve my speaking ability	3.29	1.08
4. Lecture videos were effective tools to help me learn about *critical thinking*	4.5	0.66
5. Lecture videos *were interesting*	4	0.78
6. Lecture videos were *easy to understand*	4.29	0.81
7. Independent research helped me *encounter ideas that is different from my own*	4.83	0.48
8. Independent research allowed me to *come up with my own new ideas*	4.58	0.5
9. The *difficulty level of* the debate content appropriately corresponds my *language ability*	4.25	0.9
10. The quantity of the instructional contents appropriately corresponds to my *interest*	4.13	0.85
11. During the instruction, I received *adequate assistance/advice from the teacher*	4.83	0.48
Mean score	4.25	0.77

Note: 4.50 – 500 = strongly agree,   3.51 – 4.49 = agree,   2.50 – 3.50 = neutral

1.51 – 2.49 = disagree,   1 – 1.50 = strongly disagree

Table 54 showed that student had positive opinion toward predebate phase (mean = 4.25, SD = 0.77). The mean scores of the questions which were higher than

4.50 (item 4, 7, 8, 11) indicated that student strongly agreed that the lecture videos helped them learn critical thinking (question 4, mean = 4.50, SD = 0.66), that independent research helped them encounter new ideas (question 7, mean = 4.83, SD = 0.48), and allowed them to synthesis ideas (question 9, mean = 4.58, SD = 0.50). They also strongly agreed that they received adequate assistance or advice from the instructor (question 11, mean = 4.83, SD = 0.48). On the other hand, students held neutral opinion whether the lecture videos helped them improve their English speaking ability (question 3, mean = 3.29, SD = 1.08).

4.4.1.1.2 Predebate phase: class activity

Item 12-15 were constructed to investigate the student's the predebate phase of DIFLE and focus particularly on class activity. The findings were illustrated in Table 52.

Table *52*: Predebate phase: Class activity

Questionnaire Items	Mean	SD
12. Instructional *activities* used in class effectively improved my ability to analyze arguments	4.38	0.58
13. Instructional *activities* used in class effectively improved my ability to evaluate arguments	4.46	0.83
14. Instructional *activities* used in class effectively improved my ability to create my own arguments	4.13	0.85
15. Instructional *activities* used in class effectively improved my ability to speak English	4.08	1.06
Mean score	4.26	0.83

Note: 4.50 – 500 = strongly agree,   3.51 – 4.49 = agree,   2.50 – 3.50 = neutral

1.51 – 2.49 = disagree,   1 – 1.50 = strongly disagree

Table 55 shows that students had positive opinion on the class activity in DIFLE (mean = 4.26, SD = 083). From highest to lowest scores, students agreed that the activities were effective to improve ability to evaluate arguments (question 13, mean = 4.46, SD = 0.83) analyze argument (question 12, mean = 4.38, SD = 0.58) create argument (question 14, mean = 4.13, SD = 0.85) and improved English speaking ability (question 15, mean = 4.08, SD = 1.06).

4.4.1.1.3 Debate Delivery Phase

Item 28-29 were constructed to investigate the student's the debate delivery phase of DIFLE. The findings were illustrated in Table 56.

Table *53* : Debate Delivery Phase

Questionnaire Items	Mean	SD
16. Debate has improved my ability to emphasize ideas	4.63	0.65
17. Debate has improved my ability to propose solution to a problem	3.88	0.99
Mean score	4.25	0.82

Note: 4.50 – 500 = strongly agree,   3.51 – 4.49 = agree,   2.50 – 3.50 = neutral

1.51 – 2.49 = disagree,   1 – 1.50 = strongly disagree

Table 56 showed that students had positive opinion toward the delivery phase (mean = 4.25, SD = 0.82). Question 16 (mean =4.63, SD = 065) had the mean score higher than 4.50 which indicated that students strongly agreed that debate improved their ability emphasize ideas and agreed that debate improved their ability to propose solution to a problem (question 17, mean = 3.88, SD = 0.82).

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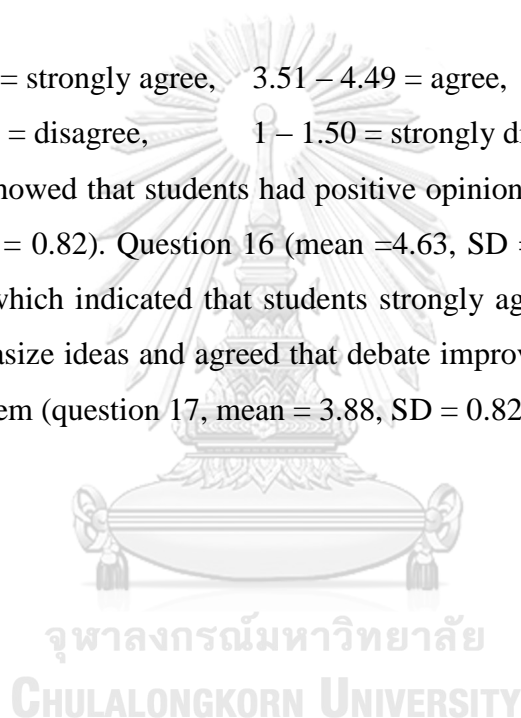
4.4.1.1.4 Post Debate Phase

Item 18-23 were constructed to investigate the student's the postdebate phase of DIFLE. The findings were illustrated in Table 57.

Table *54*: Post Debate Phase

Questionnaire Items	Mean	SD
18. Postdebate discussion helps me *understand the subject better*	4.92	0.28
19. Postdebate discussion helps me *find solution* to the problem better	4.58	0.58
20. *Feedback from friends* in postdebate discussion has positive effects on my English speaking ability	3.25	0.79
21. *Feedback from the teacher* in postdebate discussion has positive effects on my English speaking ability	4.42	0.78
22. *Feedback from friends* in postdebate discussion has positive effects on my critical thinking	3.92	0.93
23. *Feedback from the teacher* in postdebate discussion has positive effects on my critical thinking	4.83	0.38
Mean score	4.32	0.62

Note: 4.50 – 500 = strongly agree,   3.51 – 4.49 = agree,   2.50 – 3.50 = neutral

1.51 – 2.49 = disagree,   1 – 1.50 = strongly disagree

Table 54 showed that students had positive opinion toward the postdebate phase (mean = 4.32, SD = 0.62). The items with scores higher than 4.50 (question 18, 19 and 23) indicated that students strongly agree with the statement that postdebate discussion helped them understand the subject better (question 18, mean = 4.92, SD = 0.29) better at finding solution to the problem (question 19, mean = 4.58, SD = 0.58) and that feedback from the instructor in the postdebate discussion had positive effects on their critical thinking (question 23, mean = 4.83, SD = 0.38). Students remained neutral whether feedback from friends had positive effects on their English speaking ability.

4.4.1.1.5 Opinions toward the overall of debate instruction
in flipped learning environment (DIFLE)

In the questionnaire, item 24-27 were constructed to investigate the student's opinion toward the overall class structure of DIFLE. The findings were illustrated in Table 55.

Table *55*: Overall Opinion of DIFLE

Questionnaire Items	Mean	SD
24. DIFLE is *engaging*	4.42	0.72
25. DIFLE gives me *opportunities to communicate with other students* in class	4.83	0.38
26. DIFLE gives me *opportunities to communicate with the teacher*	4.71	0.69
27. DIFLE allowed me to *study at my own pace*	4.67	0.48
Mean score	4.66	0.57

Note: 4.50 – 500 = strongly agree,   3.51 – 4.49 = agree,   2.50 – 3.50 = neutral
1.51 – 2.49 = disagree,   1 – 1.50 = strongly disagree

Table 51 shows that the students were satisfied with the overall of the DIFLE course and (mean = 4.66, SD = 0.57) Apart from item 24, the mean scores of this section were higher than 4.5, which indicated that the students a strongly agreed that DIFLE gave them opportunities to communicate with peers (question 25, mean = 4.83, SD = 0.38) and with the instructor (question 26, mean = 4.71, SD = 0.69). They also thought that DIFLE allowed them to study at their own pace (item 27, mean = 4.67, SD = 0.48).

4.4.1.1.6 Effects of DIFLE on English speaking ability

In the questionnaire, item 28-31 were constructed to investigate the student's opinion toward the effects of DIFLE on their English speaking ability. The findings were illustrated in table 56.

Table *56*: Effects of DIFLE on English Speaking Ability

Questionnaire Items	Mean	SD
28. DIFLE has allowed me to speak English smoothly and without hesitation	4.38	0.65
29. DIFLE has allowed me to speak English with correct pronunciation and intonation	3.25	1.19
30. After DIFLE, I know how to use language tools (such as signposts) to structure my arguments	4.63	0.65
31. After DIFLE, I know how to use language tools to emphasize ideas and their relationships	4.83	0.38
Mean score	4.27	0.72

Note: 4.50 – 500 = strongly agree,   3.51 – 4.49 = agree,   2.50 – 3.50 = neutral

1.51 – 2.49 = disagree,   1 – 1.50 = strongly disagree

Table 56 shows that students had opinion in regard to the positive effects of DIFLE on their English speaking ability (mean = 4.27, SD = 072). The questions with scores higher than 4.50 (question 30 and 31) indicated that students had opinion that DIFLE helped them learn how to use language tools to structure their arguments (question 30, mean = 4.63, SD = 4.83) and how to use language tools to emphasize ideas and their relationship (question 30, mean = 4.83, SD = 0.38). On the other hand, student had neutral opinion regarding whether DIFLE had positive effect on their ability to produce speech with correct pronunciation and intonation (question 29, mean = 3.25, SD = 1.19).

4.4.1.1.6 Effects of DIFLE on critical thinking skills

Item 32-35 were constructed to investigate the student's opinion toward the effects of DIFLE on their critical thinking. The findings were illustrated in table 57.

Table 57: Effects of DIFLE on Critical Thinking Skills

Questionnaire Items	Mean	SD
32 DIFLE has positive effects on my ability to *analyze arguments*	4.33	0.87
33. DIFLE has positive effects on my ability to *recognize good arguments from the bad ones*	4.67	0.64
34. DIFLE has positive effects on my ability to *refute arguments*	4.33	0.7
35. DIFLE has positive effects on my ability to *create an argument*	4.67	0.48
Mean score	4.5	0.67

Note: 4.50 – 500 = strongly agree,   3.51 – 4.49 = agree,   2.50 – 3.50 = neutral

1.51 – 2.49 = disagree,   1 – 1.50 = strongly disagree

Table 57 shows that students had positive opinion in regard to the effects of DIFLE on their critical thinking (mean = 4.50, SD = 067). The questions with scores higher than 4.50 (question 33 and 35) indicated that students agree very strongly that DIFLE helped them evaluate and different between good and bad arguments (question 33, mean = 4.63, SD = 0.64) and create an argument (question 35, mean = 4.67, SD = 0.48). Students also agreed that DIFLE had positive effects on their ability to analyze and recognize parts of arguments (question32, ,mean = 4.33, SD = 0.87) and on their ability to refute arguments (question 34, mean = 4.33, SD = 0.77).

To summarize, students' responses in the questionnaire revealed their different opinions toward aspects of DIFLE. In general, the students held positive opinion toward DIFLE toward the overall of DIFLE, its effects on their English speaking ability and critical thinking and the three phases of DIFLE. Particularly, scores higher than 4.50 in the overall of DIFLE and effects of DIFLE on critical thinking illustrates positive opinion on the class structure, the communication opportunities it presented and the opinion on the effects of DIFLE on their critical thinking.

Qualitative Changes

4.4.1.2 Qualitative Analysis of open-ended Questions and suggestions

Apart from the quantitative 5-point Likert scale, students were asked to answer 4 open-ended questions in the questionnaire. This allowed students to freely express opinion without the constraints of multiple choice questionnaire and offers the education research with the perspective of learners. The questions are: 1) What do you like the most about DIFLE course? 2) What do you like the least about DIFLE course? 3) What are your suggestions on the DIFLE course? and 4) How do you think debate would help you in the future?

Content analysis of students of opinions towards Debate Instruction in Flipped Learning Environment was employed with the data drawn from open-ended questionnaire that students were required to answer at the end of DIFLE program. Students' opinions were analyzed grounded on the study by Triandis (1997), Liaw (2002), and Jain (2014) that divide student perception into three components, which are affective, cognitive and behavioral components, each of which contains a categorization of positive and negative factors.

The affective component is associated with the neural representation, in which it reflects the emotional, mood and feeling segment of an opinion. Specifically, the expression of emotions are surfaced and reacted upon external object from an individual's values and belief. Positive affective opinion is the positive expression of opinion towards an external object, which includes the expression of delight, love, and excitement. Conversely, negative affective opinion is related to dislike, disdain, hate or anxiety towards an external object.

The cognitive component relates to an individual's mental belief and disbelief towards an external object, where it functions as a "storage" for individuals to organize their processed information, whether short or long term. Positive cognitive opinion would consist of positive belief and evaluation towards an external object, while negative cognitive opinion would consist of negative belief and evaluation towards an external object.

The behavioral component is the verbal and nonverbal behavioral tendency to do, not do, or intend to do something in regard to the object of that opinion, which reflects the intention of a person leading to response tendencies and overt actions when

exposed to an external object. Positive behavior opinion would include favorable responses to do something regarding that external object, while negative behavior conveys the opposite, unfavorable responses to a certain external object.

Table 42: Opinion analysis grid and coding scheme

Components	Positive	Negative
Affective	PA	NA
Cognitive	PC	NC
Behavioral	PB	NB

The open-ended questions students' opinions were reported in three pairs of opinion elements: positive affective (PA), negative affective (AA) component; positive cognitive (PC), negative cognitive (NC), positive behavioral (PB), negative behavioral (NB).

Question 1: What do you like the most about DIFLE course?

Table 43: Entry reports of the students answer of open-ended question 1 in the open-ended questionnaire.

Question 1:	
Code	No. of Entry reports
PA	10
PC	7
PB	1
Total	18

N = 24

Table 59 presented the Entry reports of the students' opinion toward DIFLE. There were total of 18 Entry reports related to opinion toward positive experience in the program. Ten protocol reports showed that students saw the value and were engaged by DIFLE (PA). Seven protocol reports showed that students are satisfied with the gained ability to understand and express opinions (PC). One protocol report showed

that student thought DIFLE allowed them to work harder and apply the knowledge (PB).

Entry reports on Affective Opinions

Entry 1 is the example of students' opinion in terms of their feelings toward DIFLE. It showed that students saw value in the activities, such as let them express opinions, and had fun in the learning process.

Entry report 1

Positive Affective (PA)

Students comment on the overall DIFLE

Student A   *"I like the way that we can express our opinions, thoughts, and ideas independently. Since there's no right or wrong, I'm able to express my thoughts freely.*

Student B   *"The teaching style also allows me to learn with joy, to go at my own pace, and a lot more."*

Student C   *"I like the way that he let us speak independently, to show our opinion, regardless of mistakes. It is very interesting when we discuss about something, and share opinions."*

Entry reports on Cognitive Opinions

Entry 2 is the example of students' opinion in terms of their perceived improvement in cognitive capability in DIFLE. It showed that DIFLE allowed them gain new or deepen their knowledge and skills.

Entry report 2

Positive Cognitive (PC)

Students comment on the debate delivery phase of DIFLE

Student A   *"What I like the most is all the activities because these activities allow me to understand more about what I've learnt so far. Also, the DIFLE course helps me improve myself; while doing the activities, the teacher can suggest me lots of things, after all, this course is not boring."*

Student B   *"The medium students gain deep interpretation through fun activities in classroom without feeling stressful."*

Student C   *"I really like the fact that the DIFLE course focuses on the different aspects of debating, allowing students to improve on the parts that they not be as good at."*

Entry Reports on Behavioral Opinion

Entry 3 is the example of students' opinion in terms of the tendency to apply what they learn in DIFLE. It showed that DIFLE encouraged student to make effort in the task to improve their skills.

Entry report 3

Positive Behavioral (PB)

Student comments on the speaking abilities

Student A   *"The thing I like most about DIFLE course is how effective this learning style is. Not only has it made me work harder studying by myself, but also using it in the debate which allows me to improve my speaking skills also."*

Question 2: What do you like the least about DIFLE course?

Table 44: Entry reports of the students answer of open-ended question 2 in the open-ended questionnaire.

Question 2:	
Code	**No. of Entry reports**
NA	5
NC	-
NB	11
Total	16

N = 24

Table 60 presented the Entry reports of the students' opinion toward DIFLE. There were total of 16 Entry reports related to opinion of negative experience in the program. Five protocol report showed that students did not have good feelings toward DIFLE (NA). Eleven protocol reports showed that students showed lack of tendency to study or work in DIFLE (NB).

Entry reports on Affective Opinions

Entry 4 is the example of students' opinion in terms of their negative feelings toward DIFLE. It showed that student might find the learning experience to be stressful.

Negative Affective (NA)

Student comments on debate delivery phase

Student A   *"The preparation for debate can sometimes be stressful."*

Entry reports on Behavioral Opinion

Entry 5 is the example of students' opinion in terms of the lack of tendency to put effort in learning DIFLE. It showed that students lack motivation to learn, especially when it required time and self-direction.

Entry report 5

Negative behavioral (NB)

Students comments on predebate phase

Student A   *"The fact that I have to study independently is the least thing I like; I'm lazy. Moreover, sometimes I got problems from researching stuff on my own but I couldn't ask."*

Student B   *"It is time consuming. And I have to have someone to motivate me, in order to motivate me to do research."*

Student C   *"Sometimes research can be time consuming. At home, sometime the environment will cause you to be lazy and less motivated to learn."*

Question 3: What are your suggestions on the DIFLE course?

Table 45: Entry reports of the students answer of open-ended question 3 in the open-ended questionnaire.

Question 3:	
Code	**No. of Entry reports**
NA	7
NC	8
NB	-
Total	15

N = 24

Table 61 presented the Entry reports of the students' opinion toward DIFLE. There were total of 15 Entry reports related to opinion on suggestions to the program. Seven protocol reports showed that students more joy or engagement in the learning DIFLE (NA). Eight protocol reports showed that students wanted change in the content of DIFLE (NC).

Entry report on Affective Opinion

Entry 6 is the example of students' opinion in terms of their negative feelings toward DIFLE. It showed that student prefer more interaction, engaging and fun activity.

Entry report 6

Negative Affective (NA)

Students comment on predebate phase and debate delivery phase

Student A	*"More interaction in the video would be good."* *"More activities with peers from other schools for more fun debate"*

Entry report on Behavioral Opinion

Entry 7 is the example of students' opinion in terms of the lack of tendency to put effort in learning DIFLE. It showed that students wanted more information in conducting independent research and better background for understanding of the topic.

Entry report 7

Negative behavioral (NC)

Student comments on predebate phase

Student A	*"They should provide the instructions on how to use the internet and media."*
Student B	*"More deep briefers would be useful because the video is not enough to make me understand the topic."*
Student C	*"Maybe there should be a short briefing so that there would a clearer understanding so if you had questions you can get the answer immediately because sometimes research can be conflicting."*

Question 4: How do you think DIFLE will help you in the future?

Table 46: Entry reports of the students answer of open-ended question 4 in the open-ended questionnaire.

Question 4:	
Code	**No. of Entry reports**
PA	3
PC	5
PB	11
Total	19

N = 24

Table 62 presented the Entry reports of the students' opinion toward DIFLE. There were total of 19 Entry reports related to opinion on the possible application of knowledge and skills learned through DIFLE. Three Entry reports showed students expected DIFLE would change their characteristics (PA). Five protocol reports showed that students thought DIFLE would enhance their cognitive ability (PC). Eleven protocol reports showed that students expected to apply the knowledge and skills learned through DIFLE (PB).

Entry report on Affective Opinion

Entry 8 is the example of students' opinion in terms of their feelings toward DIFLE. It showed that students saw value through improvement of learners' character and confidence, but the answers did not indicate any action.

Entry report 8

Positive Affective (PA)

Students comment on critical thinking skills

Student A   "DIFLE help people to <u>think with reason</u>"

Student B   "I think debate would help me have more critical skill, improve my speaking skill, and <u>make me more confident</u>."

Student C   "It <u>develops skills necessary for work</u> such as critical thinking skills and English skills. <u>Debate also brings people together creating tight family</u>."

Entry report on Cognitive Opinion

Entry 9 is the example of students' opinion in terms of their perceived improvement in cognitive capability in DIFLE. It showed that DIFLE allowed them gain new or deepen their knowledge and skills.

Entry report 9

Positive Cognitive (PC)

Students comment on critical thinking skills

Student A   "It would improve my speaking, listening, analysis and critical thinking skills."

Student B   "Debate helps me in loads of ways such as improve my critical thinking through making arguments, make me practice solving unexpected problem through making rebuttals and asking. That being said, I gain a lot through debate."

Student C   "Debate would help me think of arguments and have my own opinions when faced with problems. It will make me more reasonable and logical when making decisions."

Entry report on Behavioral Opinion

Entry 10 is the example of students' opinion in terms of the tendency to apply what they learn in DIFLE. It showed students expected to apply knowledge and skills learned through DIFLE in real context such as work, or expected future conversations which require the speaking ability and critical thinking.

Entry report 10

Positive Behavioral (PB)

Student comments on speaking abilities

Student A   "The thing I like most about DIFLE course is how effective this learning style is. Not only has it made me work harder studying by myself, but also using it in the debate which allows me to improve my speaking skills also."

Student B   "I think debate would help me a lot in deciding things in my life. As a result of having to be critical thinking all the time I debate, I can decide thing more effectively in life. Furthermore, I would gain a lot more confidence and speak English more fluently in the future."

Student comments on critical thinking skills

Student C   "Debate has helped me to become better at speaking and critical thinking. I will be able to recognize arguments happening around me, even in work place as well. I can also jump into the arguments and able to come up with effective arguments."

4.4.2 Results from Focus Group

To obtain further opinion of the students from different group participated in the class, a focus group interview was conducted. The students participated in the focus group interview were six students – two higher scorers, two medium scorers and two lower-scorers. The opinions were analyzed with the same framework used in the content analysis of the open-ended question. The focus group interview consisted of 13 questions with 9 follow up questions, which were divided into 4 sections: the general question at the opening and the end to transition into and out of the focus group activity. The second part concerned student's opinion toward DIFLE as a teaching method. The third part concerned aspects of DIFLE that affected students' English speaking ability. The last part concerned aspects of DIFLE that affected students' improvement in critical thinking.

4.4.2.1 General questions

Table 47: Entry reports of the students answer on section 1 regarding general question

Section 1: general questions			
Code	No. of Entry reports	Code	No. of Entry reports
PA	5	NA	2
PC	3	NC	2
PB	1	NB	-
Total	11		4

Table 63 presented the Entry reports of the students' opinion for the general questions of DIFLE. The question includes 1) what was the most interesting topic in DIFLE? 2) what was the difference between your experience in DIFLE and other class? and 3) Was there anything else you want to share about your experience in DIFLE? The follow up questions consists of 1) What were the less interesting topics in DIFLE? and 2) Was there any negative experiences that you want to share in DIFLE?

There were total of 15 Entry reports related to opinion on the possible application of knowledge and skills learned through DIFLE. Five protocol reports showed that students thought DIFLE was enjoying (PA). Two protocol reports showed

that students thought DIFLE was not enjoyable (NA). Three protocol reports showed that students thought DIFLE have enhanced their cognitive ability (PC). Two protocol reports showed that students thought DIFLE did not enhance their cognitive ability (NC). One protocol report showed that students applied knowledge and skills learned through DIFLE (PB).

Entry report on Affective Opinion

Entry 11 is the example of students' opinion in terms of their feelings toward DIFLE, showing that they found the course to be satisfactory.

Entry report 11

Positive Affective (PA)

Students comment on debate delivery phase

Student A   "I enjoy debating. At first I was afraid but later on I get used to it"
Student B   "I think the classroom experience is very different. It is very active."
Student C   "The teacher discusses a lot on the topic. I am not used to no-text book environment. But it was great."

Entry 12 is the example of students' opinion in terms of their feelings towards DIFLE, showing that they found the course to be somewhat unsatisfactory.

Entry report 12

Negative Affective (NA)

Students comment on debate delivery phase

Student A   "I don't think this experience helped me much in my debating skills."
Student B   "I feel that the online materials are too bothersome. Sometimes I don't feel like reading them"
Student C   "Too many activities actually made me zone out in class sometimes."

Entry report on Cognitive Opinion

Entry 13 is the example of students' opinion that DIFLE helped develop their cognitive ability.

Entry report 13

Positive Cognitive (PC)

Students comment on debate delivery phase

Student A   *"I like to research for the debate. It helps me gain more knowledge and give me confident to speak because I know I am right"*

Student B   *"Debate presented many new ideas that opened my eyes about social issues"*

Student C   *"I think the most interesting part is the debate part. The online video also helps me to know the technique"*

Entry 14 is the example of students' opinion that DIFLE did not help them develop their cognitive ability.

Entry report 14

Negative Cognitive (NC)

Student comments on predebate phase

Student A   *"Sometimes the knowledge are too overwhelming and hard, it is difficult for me to absorb all these knowledge on time"*

Student comments on debate delivery phase

Student B   *"Debating so little time didn't make me smarter. At least I don't feel smarter."*

Student comments on predebate phase

Student C   *"I feel that the online materials can be less condensed, and more debate should be added in, because I think I improved, just not as much as I should."*

Entry report on Behavioral Opinion

Entry 15 is the example of students' opinion that they were able to apply the knowledge to real-life context.

Entry report 15

Positive Behavioral (PB)

Student comments on debate delivery phase

Student A   *"The debates changed the way I spoke. Before I cannot even make it to a 1 minute speech. Now I can speak a lot more. I think it is because I feel more comfortable communicating with others and are better in expressing myself. I feel like what I say matters."*

4.4.2.2 DIFLE

Table 48: Entry reports of the students answer on section 2 regarding DIFLE

Section 2: DIFLE				
Code	**No. of Entry reports**	**Code**	**No. of Entry reports**	
PA	-	**NA**	3	
PC	5	**NC**	-	
PB	-	**NB**	-	
Total	5		3	

Table 64 presented the Entry reports of the students' opinion toward DIFLE as an instructional method. The question includes 1) What do you think about flipped learning environment 2) What do you thinking about debate instruction? 3) Were the videos interesting or could get your attention? 4) Do you think Flipped Learning could replace traditional style teaching? And why? 5) Do you think online videos provided in DIFLE help improve your critical thinking? The follow up questions consist of 1) What did you not like about flipped learning environment? 2) Are there any aspects of the videos that you did not like? 3) What do you think could be improved in debate instruction?

There were total of 8 Entry reports related to opinion on the possible application of knowledge and skills learned through DIFLE. Three protocol report showed that students found the task boring DIFLE (NA). Five protocol reports showed that students thought videos in DIFLE helped them learn about new topic and were helpful to their learning (PC).

Entry report on Affective Opinion

Entry 16 is the example of students' opinion that the class was boring.

Entry report 16

Negative Affective (NA)

> *Student comments on predebate phase*

Student A　"Some videos are a bit boring. The ones explaining the rules can be made more fun"

Entry report on Cognitive Opinion

Entry 17 is the example of students' opinion that DIFLE helped develop their cognitive ability.

Entry report 17

Positive Cognitive (PC)

Students comment on predebate phase

Student A   *"The videos that talks about the topic were great! They were very informative and gave me a lot of insights on topics"*

Student B   *"The videos were very helpful. It taught me a lot"*

4.4.2.3 English speaking ability

Table 49: Entry reports of the students answer on section 3 regarding English speaking ability

Section 3: English speaking ability			
Code	**No. of Entry reports**	**Code**	**No. of Entry reports**
PA	2	**NA**	2
PC	-	**NC**	-
PB	2	**NB**	1
Total	4		3

Table 65 presented the Entry reports of the students' opinion toward DIFLE as an instructional method. The question includes 1) In what way do you think DIFLE help increase you English speaking ability? And 2) In what way do you think DIFLE help you in English oral communication? The follow up questions consist of 1) Do you think DIFLE does not help you as much in your English speaking ability? And 2) To what extent do you think DIFLE help you in English oral communication?

There were total of 7 Entry reports related to opinion on the possible application of knowledge and skills learned through DIFLE. Two protocol reports showed that students thought DIFLE created more confidence in the use of English speaking ability (PA). Two protocol reports showed that students thought DIFLE did not assist in creating more confidence in the use of English speaking ability (NA). Two protocol report showed that students thought DIFLE have tendency to have behavioral change to use the learned speaking ability and communication skills in general (PB). One

protocol report showed that students thought DIFLE does not have the behavioral tendency to use the learned speaking ability and communication skills in general (NB).

Entry report on Affective Opinion

Entry 18 is the example of students' opinion in terms of their feelings toward DIFLE, showing that they found the course to be satisfactory.

Entry report 18

Positive Affective (PA)

Students comment on their speaking abilities

Student A   *"I feel a lot more confident and therefore a lot more comfortable. The DIFLE and particularly debate really helped boost my confidence in speaking. I don't worry much about some of my English mistakes now."*

Student B   *"I think I feel more comfortable speaking on stage, but with friends. I am not sure I can say that much if I am with strangers"*

Entry 19 is the example of students' opinion in terms of their feelings towards DIFLE, showing that they found the course to be somewhat unsatisfactory.

Entry report 19

Negative Affective (NA)

Student comment on speaking ability

Student A   *"I still don't feel as comfortable speaking so much in English, perhaps it is because DIFLE did not give me as much chance to speak."*

Entry report on Behavioral opinion

Entry 20 is the example of students' opinion that they were able to apply the knowledge to real-life context and motivation to continue improving speaking ability.

Entry report 20

Positive Behavioral (PB)

Students comment on their speaking abilities

Student A   *"DIFLE helped me be able to speak more in front of strangers."*

Student B   *"Debate made me want to improve my speaking skills to get better"*

Entry 21 is the example of students' opinion that they were not able to apply the knowledge to real-life context and motivation to continue improving speaking ability

Entry report 21

Negative Behavioral (NB)

Students comment on their speaking abilities

<u>Student A</u> *"I don't know if DIFLE helped me. I am still scared when speaking to strangers."*

<u>Student B</u> *"I feel that I don't really want to improve my English speaking skills anymore."*

4.4.2.4 Critical thinking

Table 50: Entry reports of the students answer on section 4 regarding critical thinking

Section 4: Critical thinking			
Code	**No. of Entry reports**	**Code**	**No. of Entry reports**
PA	5	**NA**	2
PC	3	**NC**	1
PB	4	**NB**	1
Total	12		4

Table 66 presented the Entry reports of the students' opinion toward DIFLE as an instructional method. The question includes 1) In what way do you think DIFLE help increase your critical thinking? 2) In what way do you think DIFLE help you create your own argument? 3) In what way do you think DIFLE help you refute another person's argument? The follow up questions consist of 1) Do you think you DIFLE did not help you increase your critical thinking? and 2) What are some problems in creating your own argument during DIFLE?

There were total of 16 Entry reports related to opinion on the possible application of knowledge and skills learned thrDough DIFLE. Five protocol reports showed that students thought DIFLE allowed them to be more comfortable making arguments (PA). Two protocol reports showed that students thought DIFLE did not allow them to be more comfortable in making arguments (NA). Three protocol reports showed that students thought DIFLE gave them new information and perspective (PC). One protocol report showed that students thought DIFLE did not give them knew information and perspective (NC). Four protocol reports showed that students had

tendency to apply the knowledge of critical thinking in real-life. One protocol report showed that students does not have the tendency to apply the knowledge of critical thinking in real life.

Entry report on Affective Opinion

Entry 21 is the example of students' opinion in terms of their feelings toward DIFLE, showing that they found the course to be satisfactory. They became more comfortable and confident to make arguments.

Entry report 21

Positive Affective (PA)

Students comment on their critical thinking skills

Student A   "Before DIFLE, I didn't actually know what an argument really was. I thought that as long as you are more confident you can win a debate. Now I know the different components of arguments. So yes, I am more comfortable now."

Student B   "Yes, I feel a lot more comfortable. Sometimes in daily conversation I form arguments without really knowing it. After the conversation I think back and go "wow, that was an argument"

Student C   "Of course! The DIFLE course really helped me in creating arguments. However, I don't know how I can use that in daily life yet"

Entry 22 is the example of students' opinion in terms of their feelings toward DIFLE, showing that they found the course to be somewhat unsatisfactory. They show minimal signs of becoming comfortable and confident to make arguments.

Entry report 22

Negative Affective (NA)

Students comment on their critical thinking skills

Student A   "Although I can now construct my own argument, I feel that I am still not so confident in winning a debate because my case construction is not as well polished as other students."

Student B   "I am still not comfortable in making and creating my own argument, I don't think DIFLE has helped me that much."

Entry report on Cognitive Opinion

Entry 23 is the example of students' opinion that DIFLE helped develop their critical thinking and introduce students to new perspectives.

Entry report 23

Positive Cognitive (PC)

Students comment on predebate phase

Student A	*"For sure! The online videos gave me a lot of knowledge in certain topics. It made me think of topics in ways I could never thought of. "*
Student B	*" I feel like the while the videos gave me a lot of different perspective, it is the actual debate that helped me on critical thinking the most"*
Student C	*" It helped me partially. Some of the videos about the topics opened my eyes and made me think a lot about certain things."*

Entry 24 is the example of students' opinion that DIFLE displayed minimal signs that it helped develop students' critical thinking and introduce students to new perspectives.

Entry 24

Negative Cognitive (NC)

Student comments on predebate phase

Student A	*"I think the online videos are helpful, but at the same time, some of these topics are common sense and too much time are spent on these simple topics."*

Entry report on Behavioral Opinion

Entry 25 is the example of students' opinion that they were able to apply the knowledge to real-life context.

Entry report 25

Positive Behavioral (PB)

Students comment on debate delivery phase

Student A — "I think the debate lessons really helped a lot. There is one lessons specifically on how to recognize premises and claims. When I debate, I can see where the claim and premises are. It was helpful"

Student B — "The debate lessons helped a lot. Before I cannot really see or know what a premise or claim even was. Now I can identify it in a conversation even"

Student comments on speaking strategy

Student C — "I feel like DIFLE really helped me in terms of structure. I can now point out the different premises and refute back by sign posting"

Entry 26 is the example of students' opinion that they weren't able to apply the knowledge to real-life context

Entry report 26

Negative Behavioral (NB)

Student comments on speaking fluency

Student A — "While I think the debate lessons does help me to think, once I step out of the class, I don't know how to apply such thinking to real life situations."

4.5 Additional Findings

4.5.1 Results from Debate scores

Apart from the pretest and posttest, the debate sessions were conducted and were evaluated using the DIFLE rubric that included the critical thinking part along with the English speaking ability. Throughout the course, each student must participate in 3 debate session and their scores for each session were evaluated and collected. In order to examine the effects of DIFLE on English speaking ability and critical thinking, the score difference between pretest and the posttest should be complimented with results of debate score that required students to perform in real-life argumentative context.

The quantitative method of nonparametric analysis named Wilcoxon Singed-Ranks Test was used to compare debate score of the first debate session to the third. The results were presented first with the overall score and were then examined by the four components of speaking.

4.5.2 Descriptive Statistics of Speaking Ability

Speaking Fluency: Speech Flow

Descriptive statistics showed a comparison between a pretest and a posttest speaking scores in the individual speaking tasks. There is a difference in the scores of the pretest (Mean = 2.38, SD = 1.64, Min = 1, Max = 5) and posttest (Mean = 4.08, SD = 1.21, Min = 1, Max = 5).

Table 51: Descriptive statistics of the pretest and posttest on English speaking ability regarding speech flow

	Mean	**SD**	**Minimum**	**Maximum**
Pretest	2.38	1.64	1	5
Posttest	4.08	1.21	1	5

N = 24

Speaking Fluency: Pronunciation

Descriptive statistics showed a comparison between the pretest and the posttest speaking fluency scores regarding pronunciation in the individual speaking tasks. The descriptive statistics shows that there is a difference in the scores of the pretest (Mean = 2.58, SD = 1.38, Min = 1, Max = 5) and the posttest (Mean = 4.00, SD = 0.98, Min = 2, Max = 5).

Table 52: Descriptive statistics of the pretest and posttest on English speaking ability regarding pronunciation

	Mean	**SD**	**Minimum**	**Maximum**
Pretest	2.58	1.38	1	5
Posttest	4	0.98	2	5

N = 24

Speaking Strategies: Use of Sign Post

Descriptive statistics showed a comparison between the pretest and the posttest speaking strategies scores regarding the use of signposts. The descriptive statistics shows that there is a difference in the scores of the pretest (Mean = 2.83, SD = 1.55, Min = 1, Max = 5) and the posttest (Mean = 3.92, SD = 1.25, Min = 2, Max = 5).

Table 53: Descriptive statistics of the pretest and posttest on English speaking ability regarding use of signposts

	Mean	**SD**	**Minimum**	**Maximum**
Pretest	2.83	1.55	1	5
Posttest	3.92	1.25	2	5

N = 24

Speaking Strategies: Emphasis of Ideas

Descriptive statistics showed a comparison between the pretest and the posttest speaking strategies scores regarding the emphasis of ideas. The descriptive statistics shows that there is a difference in the scores of the pretest (Mean = 3.42, SD = 1.14, Min = 1, Max = 5) and the posttest (Mean = 4.08, SD = 0.83, Min = 2, Max = 5).

Table 54: Descriptive statistics of the pretest and posttest on English speaking ability regarding emphasis of ideas

	Mean	**SD**	**Minimum**	**Maximum**
Pretest	3.42	1.14	1	5
Posttest	4.08	0.83	2	5

N = 24

4.5.3 Descriptive Statistics of Critical Thinking Skills

Critical Thinking: Inference

Descriptive statistics showed a comparison between a pretest and a posttest critical thinking score in the Watson-Glaser test on students' ability to make inference. There is a difference in the scores of the pretest (Mean=3.83, SD=2.90, Min = 1, Max = 8) and the posttest (Mean=6.04, SD=1.57, Min = 3, Max = 8).

Table 55: Descriptive statistics pretest and posttest scores on of inference

	Mean	SD	Minimum	Maximum
Pretest	3.83	2.9	1	8
Posttest	6.04	1.57	3	8

N = 24

Critical Thinking: Recognition of Assumptions

Descriptive statistics showed a comparison between a pretest and a posttest critical thinking score in the Watson-Glaser test on students' ability of deduction. There is a difference in the scores of the pretest (Mean=3.25, SD=2.44, Min = 1, Max = 8) and the posttest (Mean=5.25, SD=1.8, Min = 2, Max = 8).

Table 56: Descriptive statistics pretest and posttest scores on of recognition of assumptions

	Mean	SD	Minimum	Maximum
Pretest	3.25	2.44	1	8
Posttest	5.25	1.8	2	8

N=24

Critical Thinking: Deduction

　　　　Descriptive statistics showed a comparison between a pretest and a posttest critical thinking score in the Watson-Glaser test on students' ability of deduction. There is a difference in the scores of the pretest (Mean=3.42, SD=2.19, Min = 1, Max = 8) and the posttest (Mean=5.54, SD=1.47, Min = 2, Max = 8).

Table 57: Descriptive statistics pretest and posttest scores on of recognition of deduction

	Mean	**SD**	**Minimum**	**Maximum**
Pretest	3.42	2.19	1	8
Posttest	5.54	1.47	2	8

N=24

Critical Thinking: Interpretation

　　　　Descriptive statistics showed a comparison between a pretest and a posttest critical thinking score in the Watson-Glaser test on students' ability of interpretation. There is a difference in the scores of the pretest (Mean=3.21, SD=2.08, Min = 1, Max = 7) and the posttest (Mean=4.67, SD=1.37, Min = 3, Max = 8).

Table 58: Descriptive statistics pretest and posttest scores on of interpretation

	Mean	**SD**	**Minimum**	**Maximum**
Pretest	3.21	2.08	1	7
Posttest	4.67	1.37	3	8

N=24

Critical Thinking: Evaluation of Arguments

Descriptive statistics showed a comparison between a pretest and a posttest critical thinking score in the Watson-Glaser test on students' ability of evaluation of arguments. There is a slight difference in the scores of the pretest (Mean=4.21, SD=2.65, Min = 1, Max = 8) and the posttest (Mean=4.63, SD=1.47, Min = 2, Max = 7).

Table 59: Descriptive statistics pretest and posttest scores on of analyzing arguments

	Mean	SD	Minimum	Maximum
Pretest	4.21	2.65	1	8
Posttest	4.63	1.47	2	7

N=24

4.5.1.1 Debate results on overall English Speaking Ability

Descriptive statistics showed a comparison between the first and the third debate scores. There is a difference in the scores of the first debate (Mean=11.50, SD=2.02, Min = 7, Max = 14) and the third debate (Mean=15.38, SD=1.79, Min = 11, Max = 18).

Table 60: Descriptive statistics of English speaking ability in the first and third debate

	Mean	SD	Minimum	Maximum
First Debate	11.5	2.02	7	14
Third Debate	15.38	1.79	11	18

N = 24

Table 61: The Wilcoxon Signed-Ranks Test on the first debate and third debate score of English speaking ability

	N	Mean Rank	Sum of Ranks
Negative Ranks	0	0	0
Positive Ranks	22	11.5	253
Ties	2		
Total	24		

Z = -4.120; Sig (2-tailed) = .000

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference.

Table 68 showed that of all 24 students participated in the first debate and the third debate, 22 of students gained higher scores in the third debate, 2 students gain the same scores, and none of the students gained lower scores in the third debate compared to first debate.

The test indicated that the third debate scores was statistically significantly higher than first debate scores of English speaking ability with Z value of -4.120 and at the significance level of 0.000. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a difference between the first debate and third debate scores.

4.5.1.2 Debate results on overall critical thinking

Descriptive statistics showed a comparison between the first and the third debate scores. There is a difference in the scores of the first debate (Mean = 9.29, SD = 3.46, Min = 4, Max = 18) and the third debate (Mean=14.42, SD=1.95, Min = 9, Max = 17).

Table 62: Descriptive statistics of critical thinking in first and third debate

	Mean	**SD**	**Minimum**	**Maximum**
First debate	9.29	3.46	4	18
Third debate	14.42	1.95	9	17

N = 24

Table 63: The Wilcoxon Signed-Ranks Test on the first debate and third debate score of critical thinking

	N	**Mean Rank**	**Sum of Ranks**
Negative Ranks	2	3.5	7
Positive Ranks	22	13.32	293
Ties	0		
Total	2		

Z = -4.094; Sig (2-tailed) = .000

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference.

Table 70 showed that of all 24 students participated in the first debate and the third debate, 22 of students gained higher scores in the third debate, 2 students gain the same scores, and 2 of the students gained lower scores in the third debate compared to first debate.

The test indicated that the third debate scores was statistically significantly higher than first debate scores on overall critical thinking with Z value of – 4.094 and at the significance level of 0.000. Therefore, there is sufficient evidence to accept the

hypothesis which states that there is a difference between the first debate and third debate scores.

4.6 Summary

On the whole, this chapter presents the findings which correspond with the three research questions regarding Debate Instruction in Flipped Learning Environment (DIFLE). According to the findings of the first and second research questions, the quantitative analysis has shown that students' ability in English speaking and critical thinking has significantly increased. A closer examination, however, revealed that the critical thinking ability in argument analysis did not have statistical significance. The third research question was answered with students' opinion obtained through quantitative data of Likert scale and qualitative data through content analysis. The Likert scale has shown students agreement in the positive aspects of DIFLE. Lastly, quantitative data which compared student's debate scores of the first and the third session has shown that a statistically significant increase in students' English speaking ability and critical thinking. This result is consistent with the main research findings.

CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

This chapter focuses on the summary, discussion and practical and theoretical implications of the study. The chapter consists of six parts that aim to provide a summary of the study, summary of the findings, discussion of findings, the implication of the findings, limitations of the study, and recommendations for future research.

5.1 Summary of the Study

The current study set out to answer investigate 3 main research questions: 1) what are the effects of Debate Instruction in Flipped Learning Environment (DIFLE) on Thai high school students' English speaking ability? 2) what are the effects of DIFLE on Thai high school students' critical thinking? and 3) what are the student's opinions toward DIFLE?

Debate instruction is a structured argumentation, generally held between two opposing sides called the government side and the opposition side, on a "motion" which might be a topic or a policy. The debate is carried out with the government and the opposition alternately engaging in putting forward arguments for and against the proposed motion, and ending with an adjudication of the winning side based on pre-set criteria.

In DIFLE, this debate instruction was placed in a flipped learning environment, which could be defined as a classroom that is inverted from the traditional classroom. The key characteristics of flipped learning environment was its maximization of active learning activities in class hour by pushing passive learning activities outside class hour with the use of online technology. Class hours were devoted to valuable class hour for in-class active learning tasks, such as speaking exercises, argumentation exercises and ultimately debate to achieve study goals.

DIFLE consisted of ten classes organized according to debate lessons and themes relevant to students. The course began its first session with pretest and concluded with a posttest at the eleventh session. The lessons were structured into three units pertaining to three different themes, sequentially ordered from social justice,

education, to gender. The first two sessions of a unit consisted of in-class activities, while in every third session of the unit students debated on the motion given by the researcher.

This study used single group experimental research study to answer the research questions. The research's population was Thai high school from grade 10 to 12. The gender-balanced sampling consists of 24 students from 6 different schools. All student participants have the background of at least 2 years in English or bilingual Program. The study was conducted at "Kev's Academy", an institute which offers English language and test preparation course. All participants of this study were students who were enrolled in Kev's Academy. The participant receives free intuition for the whole intensive summer course for participating in DIFLE course and are subjected to pretest and posttest. In order to provide objective measurement of the degree of DIFLE's effects, students' performance is measured with DIFLE Rubric in combination with other forms of tests for pre- and posttest.

The pretest and posttest were designed to measure speaking ability and critical speaking ability. For the speaking ability measurement, four speaking tasks were assigned, namely, the impromptu speech, identifying the strengths and weaknesses of the argument, identify focal and peripheral ideas, and roleplay as the Prime Minister of Thailand in support of the policy. All student's performance in the pretest and posttest are evaluated by the DIFLE rubric in regards to their speaking ability. As for the critical speaking ability, the students were required to sit a Watson-Glaser Critical Thinking Appraisal, which is an exam intended to measure and evaluate the critical thinking ability.

The pretest is followed by a 9-session DIFLE program was included with the purpose of improving and develop student's critical thinking and speaking ability, and then followed by the posttest. Specifically, each session follows the cycle of a predebate, debate delivery, and postdebate phase. In the predebate phase, students learn from online materials distributed through technological means, such as through social media and URL websites links. In particular, the students were assigned with video clips online that regards specific lesson topics prior to each class, and were then asked to answer certain questions online about the assigned video clips in order to instill and encourage critical thinking ability of the students. The online materials were distributed

in accordance to the activities and topics that will be taught in class. The purpose of the predebate phase is to incorporate an out-of-class learning method, or in other words, a "flipped learning environment".

In the debate delivery phase, which took place in-class, the teacher incorporated what the students have learnt in the predebate phase in relation to the topic of each lesson through various activities. These activities includes case construction, argumentation activities, and actual debate speech deliveries. This phase prepares the students with the necessary skills and knowledge to not only implement what they have learnt out-of-class, but also stimulate them with the necessary skills and knowledge for a proper debate speech delivery. While the debate only took place three times throughout the 9 session period, the other lessons are designed to prepare the students to deliver a speech. In this case, this phase is intended to enhance the students' critical thinking skills, and also to develop the speaking ability of the students.

In the postdebate phase, the teacher led discussions after each debate delivery session for the whole class, and requested opinions of each students in regards to which team is the winning side before the teacher reveals his own verdict. Additional questions were asked, such as the fulfillment of speaker roles for each speaker, and reasoning as well as the breakdown of each debate speech delivered by the students. In this resepct, the postdebate phase acts as the conclusive overview and reflection of what they have learnt in order to ensure their development in their critical reading and speaking ability.

To answer the first research question, pretest and posttest were used to evaluate the effects of DIFLE on the scores after implementation of the course. The pretest and posttest of English speaking ability was tests by requiring students to do individual speaking tasks which consisted of impromptu speech, identification of arguments, recognition of main and peripheral ideas, and role play. The students' performance was evaluated by DIFLE rubric created to measure the speech flow, pronunciation, use of signposts and emphasis of ideas. To analyze the difference of pretest and posttest score, Wilcoxon Signed-Rank Test, a form of nonparametric analysis was conducted.

To answer the second question, students were required to sit do the Watson-Glaser Critical Thinking Appraisal, a validated test designed to measure an individual critical thinking in terms of ability to make inference, recognize assumptions, make

deduction, interpretation, and analyze arguments. The results of the pretest and posttest were compared using Wilcoxon Signed-Rank Test to find statistical significance of the results.

The third research question was answered through use of opinion questionnaire at the end of DIFLE course which had the Likert scale survey form and open-ended questions to evaluate students' opinions toward DIFLE along with a focus group interview.

5.2 Summary of the Findings

The findings of the study can be summarized in three aspects: 1) the student's English speaking ability, 2) the student's critical thinking, and 3) the student's opinion towards DIFLE.

5.2.1 Students' speaking ability

Wilcoxon Signed-Rank Test was conducted for paired-sample test on the pretest and posttest score difference. Descriptive statistics showed a comparison between the pretest and the posttest speaking strategies scores regarding the emphasis of ideas. The descriptive statistics shows that there is a difference in the scores of the pretest (Mean = 3.42, SD = 1.14, Min = 1, Max = 5) and the posttest (Mean = 4.08, SD = 0.83, Min = 2, Max = 5).

The finding showed that, for the overall score, of all 24 students participated in the pretest and the posttest, 21 of students gained higher scores in the post test, 2 students gain the same scores, and 1 student gained lower scores in the posttest compared to pretest. The test indicated that the posttest scores was statistically significantly higher than pretest scores of English speaking ability with Z value of -4.043 and at the significance level of 0.000.

Focusing on the precise critical thinking indications, there are also four other indications in terms of speaking ability and differences between pretest and posttest scores, namely, speech flow, pronunciation, use of signposts, and emphasis of ideas. For the speech flow, the test indicated that the posttest scores was statistically significantly higher than the pretest scores with the Z value of -3.371 and at the

significance level of 0.0001. As for the pronunciation, the posttest scores was significantly higher than the pretest score, with the Z value of -2.951 and at the significance level of 0.03. The comparison of the value in terms of use of signposts, as well as emphasis of ideas also shows that the posttest scores were statistically significantly higher than pretest scores with Z value of -2.132 and -2.431, respectively, and at the significance value of 0.033 and 0.015, respectively.

Thus, in summary, due to the statistical difference between the pretest and the posttest scores, the Debate Instructions in a Flipped Learning Environment (DIFLE) was effective in terms of developing and improving the speaking ability of the students. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a difference between the pretest and posttest scores.

5.2.2 Students' critical thinking

Wilcoxon Signed-Rank Test was conducted for paired-sample test on the pretest and posttest score difference. Wilcoxon Signed-Rank Test was conducted for paired-sample test on the pretest and posttest score difference. Descriptive statistics showed a comparison between a pretest and a posttest critical thinking score in the Watson-Glaser test. There is a difference in the scores of the pretest (Mean=17.916, SD=5.241, Min = 8, Max = 28) and the posttest (Mean=26,125, SD=3.442, Min = 19, Max = 32).

The findings showed that, for the overall score, of all 24 students participated in DIFLE pretest and posttest, 23 of them gained higher scores in the posttest, 1 student gained the same scores, while none of the student gained lower scores in the posttest compared to pretest. The test indicated that the posttest scores was statistically significantly higher than pretest scores of critical thinking with Z value of -4.203 and at the significance level of 0.000. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a difference between the pretest and posttest scores.

However, a close examination of different aspects of critical thinking showed that student's ability to analyze arguments did not improve. A Wilcoxon Signed-Ranks Test was conducted to measure difference in median scores of the pretest and posttest. Table 25 showed that of all 24 students participated in DIFLE pretest and posttest, 13 of them gained higher scores in the posttest, 2 students gained the same scores, while 9

of the student gained lower scores in the posttest compared to pretest. The test indicated that there was no statistical difference between the posttest and the pretest scores of critical thinking regarding the ability to evaluate arguments. ($Z = -4.203$, significance level $= 0.492$).

Focusing on the precise critical thinking indications, there are also five other indications in terms of critical thinking ability and differences between pretest and posttest scores, namely, inference, recognition of assumptions, deduction, interpretation and evaluation of arguments. As shown in Table 28, the test indicated that the posttest scores of inference was statistically higher than the pretest scores of critical thinking with the Z value of -2702 and at the significance level of 0.007. In Table 30, the test indicated that the posttest scores of inference was statistically higher than the pretest scores of critical thinking with the Z value of -264 and at the significance level of 0.009. While for deduction and interpretation shown in Tables 32 and 34, the posttest scores were statistically higher than the pretest scores with the Z value of -2.970 and -2.610, respectively, and at the significance level of 0.003 and 0.009, respectively. Lastly, in terms of the evaluation of arguments, the test indicated that there was no statistical difference between the posttest and the pretest scores of critical thinking, with the Z and significance level of 0.429. Therefore, in this respect, there is insufficient evidence to accept the hypothesis and thus the null hypothesis which states that there is a difference between the pretest and posttest scores in accepted.

Thus, in summary, due to the statistical difference between the pretest and the posttest scores obtained through Watson-Glaser test, the Debate Instructions in a Flipped Learning Environment (DIFLE) was effective in terms of developing and improving the critical thinking ability of the students. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a difference between the pretest and posttest scores.5.2.3 Students' opinion towards DIFLE

In response to the third research question, students' opinions toward DIFLE was analysed using both quantitative and qualitative analysis. The quantitative analysis showed that students had positive opinion toward DIFLE, especially on the overall of DIFLE and critical thinking. The qualitative analysis was conducted with content analysis which divided students attitude into 4 pairs of positive and negative opinion;

these were Positive Learning Environment (PLE), Negative Learning Environment (NLE), Positive Affective component (PA), Negative Affective component (NA), Positive Cognitive component (PC), Negative Cognitive component (NC), and Positive Behavioral component (PB), Negative Behavioral component (NB),

Since independent research was done without an instructor's supervision, measure must be taken to evaluate the result of these self-study sessions. This could lead to a problem found in a study by Butler (2014) that students may lack responsibility to prepare ahead of class, which could intern compromise the effectiveness of the class. To increase compliance from students, instructor should to set basic questions for students at the beginning of the class but in a way that students could master individually, and based on low-stake assessments (Gilboy et al., 2015).

5.2.3 The students' opinion towards DIFLE

The students' opinion towards DIFLE were analyzed by using both quantitative and qualitative data from the opinion survey questionnaire and focus group interview. The quantitative data derives from the first part of the questionnaire, where the opinion towards the overall of DIFLE consist of a mean score of 4.66 (SD = 0.57) under the Likert Score scale. Since the average score is 4.66, it indicates that the students contain a positive opinion towards DIFLE and strongly agrees that DIFLE is an effective program that enhances their speaking ability and critical thinking skills.

As for the qualitative data, it was obtained by the second half of the opinion survey questionnaire, which is called the open-ended questionnaire, as well as the focus group interview. Both instruments reveal that students conveyed a positive opinion towards DIFLE in terms of their speaking ability and critical thinking skills. Specifically, the students have expressed their positive opinions towards the technological utilization and distribution in a flipped classroom environment, in-class activities and debate, as well as the postdebate discussions. Furthermore, most students also mentioned that DIFLE was beneficial for them in terms of improving their speaking abilities and critical thinking skills, as they have reported that such skills have increased after the program. For instance, some students reported that they are now able to think and debate with more logical flow and fluency, and are more confident when

facing real-life situations, such as talking to strangers. The students have also expressed that online independent research help them crystallize the assigned information and is a good pre-class preparation.

In conclusion, the Debate Instructions in Flipped Learning Environment (DIFLE) is effective in terms of developing the students' speaking ability and critical thinking skills.

5.3 Discussions

This study set out to assess the impact of the Debate Instruction in Flipped Learning Environment (DIFLE) on the students' speaking ability and critical thinking skills. The discussion in relative to this study is based on the following three aspects of the findings: 1) the improvement of students' speaking ability after implementing DIFLE; 2) the improvement of students' critical thinking skills after implementing DIFLE; 3) the students' opinion towards DIFLE.

5.3.1 The improvement of students' speaking ability after implementing DIFLE

The study portrayed and demonstrated a significant enhancement and improvement of the students' speaking ability upon receiving the Debate Instruction in Flipped Learning Environment (DIFLE). Through the DIFLE study, the students have displayed a noticeable improvement and obtained higher scores on the posttest, namely, presentation style, speaking fluency, pronunciation and intonation, and grammatical use. The results of this study is consistent with the finding in related research studies, where DIFLE study is shown to have positive impact on the students' speaking ability with better speech delivery and increased fluency comprehension (Agustiawati et al., 2015a; Alasmari & Ahmed, 2012; Sanjaya et al., 2014). Specifically, further explorations shall be discussed in relation to the two key components of this section, namely, 1.) the debate instruction in DIFLE, 2.) the flipped learning environment in DIFLE, and 3) drawbacks of DIFLE in students' speaking ability.

5.3.1.1 The debate instruction in DIFLE

With numerous debate formats in existence (i.e. classroom debate (Omelicheva, 2007)), the debate instruction in DIFLE has adapted the Broad Participants Debate (BPD) Model, which was developed and designed to synthesize three models of classroom debate, namely, Pre-set Question model, Whole Class Debate Model, and Structured Classroom Debate (SCD) Model, in order to enhance the inclusivity of debate and intensiveness as a way to ultimately improve the speaking ability of the students. The BPD Model consists of a cycle containing three stages: 1) the predebate phase; 2) the debate delivery phase, and; 3) the postdebate phase. Each stage of the BPD model contain essential roles that contributes to the students' improvement in their speaking ability. Particularly, each stage contains different learning experiences and stimulations that attributes to the students' ability to increase specific speaking ability, as aforementioned in the previous section, consist of presentation style, speaking fluency, pronunciation and intonation and grammatical use (Brown, 2004).

In this respect, a detailed discussion regarding the significant effect that DIFLE have on the students' speaking ability under debate instruction is explored and explained below.

Prior knowledge in debate instruction

Prior knowledge in this case refers to the additional knowledge obtained from the predebate phase of DIFLE in terms of debate instruction, which prepare students with the necessary knowledge and method in relation to the pre-determined topic that will be discussed and engaged during debate delivery phase and postdebate phase. Though the predebate phase does not directly enhance the student's speaking ability through active practical activities, it indirectly helps the students in knowing what to say and obtain different perspectives and ideas through their learning of various online video clips and out-of-class activities. The findings were in accordance with Baleghizadeh and Shahri (2014), who stated that speaking ability is intertwined with the speaker's capacity of knowledge of the topic and vocabulary skills.

More specifically, as the studies of Akin & Seferoglu (2004) and Celc-Murcia & Olshtain (2001) have stated, knowledge on the topics assigned and prior adequate learning techniques are imperative contributions to the improvement of speaking skills, and the lack of domain knowledge and learning techniques could pose problem when students engage in speaking. This implies that if the students have obtained enough knowledge and received the right learning techniques with adequate vocabulary skills, their speaking skills will be improved. In this case, the students were exposed to various independent research assignments and were required to watch various online videos regarding certain topics, such as the topic of "death penalty" prior to the debate delivery phase. According to the students' opinion from the opinion survey questionnaire, the introductory videos, lecture videos, independent research were all effective tools to help them understand the topic, explore new ideas that are different from their own, and ultimately contributed to their improvement of speaking skills. Furthermore, the results from the open-ended questionnaires also further agreed by stating statements such as "*I like to research for the debate. It helps me gain more knowledge and give me confidence to speak because I know I am right*." Thus, prior knowledge in the predebate phase is the foundation phase of the process for students to enhance their speaking ability (Celce-Murcia, 2001). In this respect, the findings of the predebate phase is consistent with the aforementioned studies, where online materials and activities, which enhances their knowledge, vocabularies, and ideas, were proven to be effective in improving the students' speaking ability.

Improvement of speaking ability through in-class activities and debates

In-class activities and debates assists in enhancing the speaking ability of the students by applying students' prior knowledge that is obtained in their predebate phase in the specific assigned topic, and through various activities, such as argument constructing session, case construction, team work sessions, and debate rounds requiring students to actually deliver a debate speech, the students' speaking ability are actively and significantly enhanced through these multi-formed activities. According to the students addressed in the focus-group interview, they have stated that "*debate changed the way I spoke. Before I couldn't even make it to 1 minute speech. Now I can speak a lot more. I am more comfortable in communicating with others and are better*

in expressing myself." Other students have also addressed that through in-class practical activities and applications, they were able to improve their speaking ability as a whole. Specifically, the students attributed their improvement from (i) the in-class activities, and (ii) the actual debate rounds. Both factors shall be discussed extensively below.

The in-class activities in the debate delivery phase in DIFLE, which contains material hand-outs, group participation and activities, influences the enhancement of the students' speaking ability. According to Piaget (1971), learning does not occur as a result of mere copies of ideas, but rather when person acts on those ideas, and develops a systems of alternatives to actively transform the object of their thoughts. In this regard, the handouts and activities provided during debate delivery phase is used for the aforementioned purpose, where students are able to engage in self-develop their own system in tackling certain arguments and construct their own ideas, and ultimately express those ideas. The students in the open-ended questionnaires have also expressed that the in-class activities were useful in not only learning how to speak in a structural way, but it also gave them further confidence and encouragement to speak out and express their own ideas. In this case, the usefulness in in-class activities in the debate delivery phase is consistent with Brandsford, Brophy & Williams (2000), which stated that more interactive tasks enhance students learning and speaking ability through action. Thus, it can be said that the in-class activities, through various handouts and teamwork sessions, builds the students' ability, structure, and courage to speak, and ultimately improve their speaking ability.

Furthermore, the actual debate rounds is an in-class activity where there will be a division of two teams, and each speaker would speak for 5 minutes in rotation, while the other side is allowed to raise point of information (POIs) to engage in their arguments. Debate is particularly useful in development of speaking skills as it requires debaters to perform tasks of oral production at the highest end, prompting students to orally present their ideas to other participants. According to the open-ended questionnaire of this study, the students have reacted positively to debate, stating that debate has boosted their speaking skills significantly, and also have "*improved their expressive ability, and be able to speak with confidence and knows what to say at all times*". Further similar comments by the students have been provided in the focus-group interview, where students reacted positively towards their results of improved speaking

ability. The findings of this study is ultimately consistent with Chamot and O'Malley (2013), where it states that debate let students exercise a whole range of language functions, including explaining, informing, justifying, debating, describing, classifying, proving, persuading, and evaluating. Additionally, several empirical studies (Agustiawati et al., 2015a; Sanjaya et al., 2014) have shown that there are significant improvement in students' speaking ability and vocabulary after applying debate in their class activity, and encompasses other skill areas such as grammar and comprehension. Petrus et al. (2015) noted that knowledge and practice also led student to be more accustomed to the expression of ideas and rendering them to be more confident in their expression of opinions.

In this respect, through the feedback and opinions of the students, as well as the supporting studies and surveys, it could be said that the in-class activities, together with the debate rounds ultimately improves and enhances their speaking ability.

Cross-feedbacks

After the predebate and debate delivery phase, the students and the teacher will cross-criticize each other, where a "feedback loop" is created, where the instructor would provide oral critical reviews, where he would examine each students' performance on their speaking abilities, and each students would examine each other's speaking ability as well. This process acts as an "open forum" for the whole class to evaluate each other's performance as a whole. In this case, the instructor would examine them based on Brown (2004)'s theory of micro and macro speaking abilities, and whether the students have enhanced their performance. Although this factor does not directly impact the students' speaking ability through in-class activities and debate delivery, it serves as an extensive concluding and assessing factor as to how the student spoke, and what are the ways to improve their speaking abilities in the future. This finding is reflected upon the opinion survey questionnaire of this study, to which students have shown, on average, a positive satisfaction towards the postdebate phase, as most of the students agree that postdebate discussion not only helps them understand the subject better, but it also has positive effect on their speaking ability through feedbacks from their peers and the teacher. The findings of this study is also consistent

with Oros (2007), who mentioned that issues of debate as classroom practice must be addressed and with instructors giving "take away points" and address issues in the debate during post-debate discussion and reflection could help the class gain more benefit from the debate.

Thus, the findings from the present study is consistent with the results from previous research, studies and surveys. In conclusion, the DIFLE study, which implemented classroom debate through a three step cycle under debate instruction was relatively effective and successful in improving the students' speaking ability.

5.3.1.2 The flipped learning environment in DIFLE

The other key component for this section that contributes significantly to the speaking ability of the students is the flipped learning environment which was integrated into DIFLE. Flipped learning environment is the process of having students learn their materials outside of the classroom through online instructional videos and activities, while group exercises and implementations are done in-class. In this case, the three factors that relate to how the flipped learning environment impacts the students' speaking ability are 1) online platform; 2) flexible learning; and 3) debate in flipped learning environment.

Online platforms

Online platforms in a flipped learning environment in DIFLE is highly possible through today's advanced technology, as Fletcher (2001) deems flipped learning environment as a technological revolution in education, and Brandsford, Brophy & Williams (2000) emphasizes that this revolution in education allows students to no longer be dependent upon the teacher to give them knowledge, because they are able to gain access to information by themselves. In this study, the application of technological tools outside of the classroom is used to prepare the students of a certain specialized topic before the debate delivery phase. Specifically, introductory videos, lecture videos, independent researches and online predebate questions and unit exercises are uploaded online via Google Drive with URL access to specific YouTube videos, and distributed to students to watch the aforementioned videos and complete

the exercise prior to the start of each class. Not only does this foster the student's knowledge towards the topic, but it also enables the students to obtain the ability to speak towards this topic. With the instructor being active in collecting student answers and analyze common mistakes of each, students will be able to obtain case structure and speech structure, as well as the expansion of vocabulary prior to the start of the actual class. The flipped learning environment approach in the predebate phase essentially contributes to the advancement in students' speaking ability. This process fosters intentional content and flexible environment in accordance to the pillars of Flipped Learning Network (2014), where the instructor must not only provide and distribute the correct materials, he must also ensure that the technological access is simple, so as to ensure that the students can achieve flexibility during their outside class study period. In the open-ended questionnaires, the students find the implementation of the flipped learning environment to be very "comfortable" as they are allowed to concentrate more at home, while other students have commented that they "liked the introductory videos. They allow me to really know the materials and help with my English speaking ability". In this case, the students' feedback is consistent with the study of Canning-Wilson (2000), where it showed that students liked learning language and were motivated to learn with the use of media and instructional tools because they find it interesting. It is also noteworthy to restate the study by Akin & Seferoglu (2004), where a limited domain of knowledge and vocabulary skills will inhibit the student's confidence and capacity to express their ideas orally. Therefore, the implementation of technological tools for students to self-study the materials is an effective way to assist their improvement of speaking ability. Thus, in relation to the aforementioned student feedbacks and previous researches and studies, the implementation of online platforms and other technological tools in the DIFLE study has generally promoted and improved the student's speaking ability.

Flexible learning

The second factor that improves the students' speaking ability after implementing the DIFLE study under the flipped learning approach is the flexibility in terms of learning time. According to Black, Harrison, Lee, Marshall & William (2004), teachers in traditional classrooms are restricted by the provided class time, and thus must teach at a certain pace, and such a pace may not be suitable for all students. However, with the emergence of technology, the flipped learning environment approach is possible, with multi-purpose smart-phone devices enabling students to gain access to the online videos with their own pace. This means that each students will be able to self-learn and self-study at their own pace without being bound to the pace of the traditional classroom itself, which ultimately mirrors flexible environment in the pillars of the flipped classroom by Flipped Learning Network (2014).

Specifically, the flexibility and time management in flipped learning environment has been observed as one of the main advantages. In the DIFLE study, flipped environment learning is able to provide flexible time for students to learn their materials. Students in the open-ended questionnaire mentioned that liked this system, as they had control over their own learning place and can study at home. Moreover, students in the focus-test group has also said that "*not only has DIFLE made me work harder studying by myself, but also using it in the debate which allows me to improve my speaking skills also.*" This suggests that in the flipped learning environment, the students have more time and flexibility to learn at their own pace, and with the rise of technological advancement students are able to gain access to these online materials at any time. By learning outside of the classroom, the students in the open-ended questionnaire emphasized that they had more time to absorb the learning materials to understand it in-depth, and even had time to self-construct their own speech beforehand as well. This is further confirmed by students in the focus-group interview, where they said that the online videos helped them know the techniques to deliver a debate speech prior to the class. Thus, with the benefit of the availability of online platforms, the students have the advantage of studying the rules of debate and topic background prior to the class in accordance to their own time and pace, in order to arrive to class fully prepared for the practical implications of those knowledge. The findings of this study correlates with Siemens (2005), which states that self-learning is beneficial for

learnings as they are in control of their own learning process, and the digital nature of the media means that students can fast-forward over parts they already understood or replay parts of the materials that is more complex and harder to understand. In the context of speech delivery, fast learning students can learn the more complex tasks of a debate speech, while the slow learners could be instructed more through online materials prior to the debate. Thus, the digital era has given technological benefits for DIFLE to employ the flipped learning environment approach, and through previous case studies and student feedbacks, the flexibility provided by the flipped learning environment in DIFLE promotes and improves the students' speaking ability.

Debate in flipped learning environment

The last factor that improves the students' speaking ability after implementing the DIFLE study under the flipped learning approach is the debate implementation upon receiving knowledge and content from the online platform by the student's own flexible time and pace. Debate under DIFLE is the practical implementation of the knowledge, debate rules and skills, and case construction ability into actual use through arguments, rebuttals, as well as point of information (POIs). In this study under flipped learning environment, debate occurs during the debate delivery phase, where students utilizes their knowledge of the topic and technique obtained out-of-class into practical use through an actual debate round, where students are to express themselves through a 5 minutes speech, while the students on the opposing side will engage and rebut, and provide their own line of argumentation. This engaging type of oral presentation of their ideas allow students to directly experience and practice giving a speech, and this activity enhances and improves their speaking ability. This is thus different from a traditional classroom debate, where the instructor must educate the students of the basic debate rules and topic matters, as well as organizing a debate round within class-time restriction, which hinders the students' maximization of learning opportunity and growth. Furthermore, this mirrors professional educator, intentional content, and learning culture, where the instructor plays an active role during the debate rounds, ensuring that the debate processes smoothly. Moreover, the instructor must create a learning environment, where the engagement of debate must align with the topic that is being taught, and ensure that the students are aligned with such topic, and explores such

topic in to a deeper analysis. Such can be supported from the student responses in the open-ended questionnaire, who have expressed their confidence and their willingness to speak and express more. For instance, a student stated that "*I like the way we can express our opinions, thoughts, and ideas independently. Since there's no right or wrong, I'm able to express my thoughts freely*". Another student from the focus-group interview agrees to the aforementioned statement and added that "*I enjoy debating. At first I was afraid but later on I got used to it, and I feel like I can speak a lot more*". The improvement of the students' speaking ability is further validated and correlates with Strayer (2007), who emphasizes that the two components, consisting of computerized learning of material of outside of class and in-class activity, would ultimately create a learning environment that employs interactive activities inside of class. Such a learning environment significantly their speaking ability in this sense, as Piaget (1971) added that learning does not occur as a result of mere copies of idea, but rather when person acts on those ideas. This implies that debate serves as the "acting" upon the ideas that the students have been exposed to, and thus learns how to express their ideas orally, and ultimately enhances their speaking ability.

In reference to the aforementioned results, it can be concluded that the improvement in the students' speaking ability has resulted from the DIFLE study and the integration of debate instruction and flipped learning environment with the support by the technological tools and online materials for students to learn and study out of class and utilize their knowledge and ideas within the classroom activities. Thus, the findings from this study conform to the theories and results from previous studies, in which a flipped classroom approach, alongside with debate instruction contains positive impact and effect on enhancing and improving the student's speaking ability.

5.3.1.3 Drawbacks of DIFLE in students' speaking ability

As mentioned earlier, DIFLE proved to be effective in improving the students speaking ability. However, there were limitations in applying DIFLE to the students. The negative effects and drawbacks that were observed are as follows: (1) the language proficiency of the students (2) time restriction of the DIFLE sessions.

The first drawback is related with the English proficiency of the students. Although students were from high schools with at least 2 years of English-educated background, it does not necessarily signify that each student will be able to deliver a debate speech fluidly through a 9 session DIFLE program. That is to say, there are no parameters, or control group to ensure that each student under the DIFLE program has similar English proficiency and similar learning pace when the instructions are conducted purely in English. Specifically, some students expressed in the focus group interview that the debate sessions were rather hasty and slightly too difficult for their level of English, while some other students expressed that the independent research that requires them to combine their knowledge on the specific topic distributed online and debate rules were difficult, but were nonetheless grateful that such tasks were done out-of-class and within their own pace. Furthermore, some students have also expressed that had their English been more proficient, DIFLE program would have been more beneficial for them. Meanwhile, other students expressed that their speaking ability has drastically improved after such a session. This suggests that not all students that has two years of English-educated background has the same English proficiency and learning pace.

The second drawback relates to the time restriction of the DIFLE sessions. Though the aim of this program is to maximize students' speaking ability potentials through activities and debates, and leaving the self-educated learning to the students themselves through a flipped learning environment, there were still signs of time restrictions. With each DIFLE session lasting only for two hours, one debate session would already consume a major amount of time before any post-discussions could be conducted. Specifically, with each speaker speaking 5 minutes, and there are 6 speakers in total, one debate round, alongside with reply speeches and pauses in between will roughly take around 40 – 50 minutes. Thus, there will only be one hour for in-class

activities and postdebate discussions. Thus, some students have expressed that they do not feel that their speaking abilities has improved as much as they should, which may be due to the time restrictions that exists in class, despite it is conducted in a flipped learning environment.

With respect to the result, it can be concluded that the improvement in the students' speaking ability has resulted from DIFLE activities. However, there are some drawbacks regarding to the level of students' English language proficiency, as well as the time restrictions of each DIFLE session.

5.3.2 The improvement of students' critical thinking skills after implementing DIFLE

The study has demonstrated a noticeable improvement of the students' critical thinking skills through the Debate Instruction in Flipped Learning Environment (DIFLE). Through the DIFLE study, the students have displayed an increased improvement and have obtained higher scores in their posttest in comparison to their pretests in the categories of, namely, case construction, argument construction, refutation of argument, and use of information. Specifically, a significant increase in the overall results of critical thinking from the pretest and posttest can be observed, in which the result of the mean score of the posttest is 14.42, compared to that of the pretest, which was 9.29. The statistics report of the posttest of the specific categories of critical thinking skills are also higher than that of the pretest. Therefore, this portrays that, after the implementation of DIFLE to the students, there is a positive impact on the students, and have improved their critical thinking skills accordingly. The results of this study is consistent with the findings in related research studies which states that debate instruction and flipped learning environment is an essential tool to promote the students' critical thinking ability (D Krieger, 2005; Zare & Othman, 2013).

The impact that DIFLE has on the critical thinking ability of the students will be thoroughly discussed through the following two points: (1) prior knowledge and flipped learning environment, and (2) debate instruction. It shall be noted that the following discussion to explore the impact of DIFLE on the critical thinking ability of the students will be analyzed and complemented with the most widely-used assessment model of critical thinking, known as the RED Model (Chartrand et al., 2013), which is

divided into three factors, which are recognize assumption, evaluate argument, and draw conclusion, respectively. The function of all three factors are summarized below:

Recognize assumption conveys one's ability to distinguish between fact and opinion, which implies the ability to notice and question the information presented in front, and not assume such information immediately upon receipt. *Evaluate argument* is the ability to analyze the given information and argument objectively, which involves the constant question of the legitimacy of the supporting authorities and evidence, as well as the awareness of how emotions may influence the information. *Drawing conclusio*n depicts an individual's ability to bring various different information together and arrive at a conclusion in such a way that it logically flows with all the given evidence, and does not misdirect the conclusions beyond what is presented in the evidence.

5.3.2.1 Debate Instructions and Flipped Learning Environment

Under DIFLE, students must obtain prior knowledge through online technological materials, either through selected YouTube videos or handouts distributed by the teacher via GoogleDrive. In this study, students who have participated and viewed the aforementioned videos and online materials are more self-prepared to be more critical in terms of case construction and create relative arguments, and such activities benefit the students in terms of their critical thinking ability. The findings of this study correlates with Krawthwohl (2002), where class material given to student prior to the actual class contains lower level learning which students could master individually with self-study tasks, and are more likely able to make a constructive and relevant argument. Then, students were tasked to execute a debate and participate in discussions in debate delivery and postdebate phase, where students were tasked with in-class activities as well. More specifically, the access to online materials in gaining prior knowledge in predebate, as well as the in-class activities and debate rounds in debate delivery and postdebate phase enables students to experience (i) recognize assumption, (ii) evaluate argument, and (iii) drawing conclusions. Each factors shall be explicitly discussed below.

Recognize assumption

As aforementioned, recognizing assumption relates to the ability of an individual to distinguish between fact and opinion, and one will not "rush" into conclusion. Such factor also mirrors Fisher's (2001) and Diane Halpern's (1994) categorization of critical thinking skills. In this study, students in the DIFLE program were tasked to complete various independent research in relation to the lecture videos that were distributed online via GoogleDrive with YouTube links. The independent research acts as a guideline for further self-learning. These independent research process forces students to encounter various facts and opinion on the issue, and understand differences among opinion, reasoned judgment, and fact. The independent research exercises are designed to be consistent with Fisher's (2001) critical thinking skills categorization, to which the students will obtain the ability to identify and evaluate assumptions, and thus allowing them to recognize assumption under the RED model. Furthermore, under a flipped learning environment, recognizing assumption as part of the critical thinking skills is more attainable in comparison to a traditional classroom. According to Siemens (2005), self-learning is beneficial because they are in control of their own learning process, and thereby students can fast-forward or replay parts in order to truly understand and evaluate the pre-assigned online materials. In this respect, a flipped learning environment allows students to control their own pace to not only understand the prior knowledge that they obtain from out-of-class materials, but also have the space to evaluate their materials through independent researches (Fisher, 2011; Siemens, 2005). The students from the opinion survey questionnaire and open-ended questionnaire have also displayed improvement in their critical thinking skills in regards to their learning pace, as well as improving their ability to differentiate between fact and opinions. For instance, one student commented that "*DIFLE help me to think with reason, and the independent researches made me more aware of what are the facts and what are the opinions to a certain topic, such as death penalty*".

Likewise, under debate delivery and postdebate phase, students in the DIFLE program were assigned to complete several in-class activities through handouts and group work, and such work includes keyword identification, case construction, debate vocabulary, working in team sessions and debate delivery. These activities, in relation to recognize assumption under the RED model, allows for students to construct their

cases in light of understanding and be able to differentiate between fact and opinion, and also be able to make refutations towards their opponent's stance, either by pointing out contradictions or flawed facts. These activities are consistent with Fisher's (2001) critical thinking skills categorization, to which the students will obtain the ability to identify and evaluate assumptions, and thus allowing them to recognize assumption under the RED model. Furthermore, under the combination of a flipped learning environment and through debate instructions, recognizing assumption as part of the critical thinking skills becomes more attainable in comparison to a traditional classroom (Siemens, 2005). The findings of this study is consistent with Krieger (2005), which states that debate yields benefits to critical thinking, and it is helpful because it engages students in a variety of cognitive and linguistic way. In this regard, one of the most important cognitive and analytical ability is the ability to recognize assumption and understand the separation between fact and opinion. The students from the open-ended questionnaires have also displayed improvement in their ability to recognize assumptions through this study, as students have commented that "DIFLE helped me think with reason, and made me aware of what are the facts and what are the opinions to a certain topic", while other students have commented that "*the DIFLE program have so many activities that helped me. I am now able to really identify what are the facts of the case and what are not*". Thus, in relation to this study's findings and related previous research case studies, the implementation of this study, particularly during the debate delivery and postdebate phase, improves the students' critical thinking skills in terms of recognizing assumption under the RED model.

Thus, in relation to this study's findings and related previous research case studies, the implementation of this study, particularly during predebate, delivery and postdebate phases, where prior knowledge is obtained and is practically implemented through in-class activities and discussions, improves the students' critical thinking skills in terms of recognizing assumption under the RED model.

Evaluating argument

Evaluating argument is the ability to analyze the given information and argument objectively by questioning the legitimacy of the supporting authorities and evidence. Similarly, this factor under the RED model mirrors Fisher's (2001) and Diane Halpern's (1994) categorization of critical thinking skills. In this study, the students' assignment of independent research also forces the students to obtain argument evaluation skills, where they will need to judge the credibility of an information source, and judge the consistency to the reasoning of an argument. This assists the student in obtaining critical thinking skills and meta-cognitive skills for debate, as they will need to evaluate arguments from online clips from a specialized topic and debate concept. As such, these independent exercises are consistent with Fisher's (2001) categorization of fundamental critical thinking skills, namely, "judge the acceptability, especially the credibility, of claims" and "evaluate arguments of different kinds". Furthermore, according to Chen et al., (2004), critical thinking is determined by the thinker's cultural upbringing, prior beliefs, and familiarity with subject which allows the thinker to evaluate with plausibility, factors and hypotehses and point out anomalies. In this respect, the study's predebate phase is constructed for students to obtain prior knowledge outside of the class in order to familiarize themselves with the topic, and enhance them with argument evaluation skills through independent researches. As aforementioned, with Siemen's (2005) confirmation that self-study is more effective, prior knowledge obtained through the predebate phase allows the student to evaluate argument in a more critical way. Students from the open-ended questionnaire and focus group interview have showed that they were able to evaluate arguments more thoroughly through the exposure of online video clips and independent research, and further commented that the out-of-class assignment allowed them to work on their own pace and time. For instance, one of the excerpts showed that a student had experienced the whole process of the predebate phase, and shared his thoughts by mentioning that "*The videos, along with the independent exercises that were attached along were fantastic. It helped me learn how to structure and rebut cases through a specific topic without even going to class. I feel like I have improved on my critical thinking skills and case analysis skills just from that*".

During debate instruction, the students were tasked with various activities and an actual debate in order to judge the credibility of an information source, and judge the consistency to the reasoning of an argument. This allows for students to obtain critical thinking skills for debate, as they will need to evaluate arguments during the debate in order to strengthen their own case, or create strong rebuttal cases to oppose the other team. As such, these activities and debates are consistent with Fisher's (2001) categorization of fundamental critical thinking skills, namely, "judge the acceptability, especially the credibility, of claims" and "evaluate arguments of different kinds". Furthermore, according to Chen et al., (2004), critical thinking is determined by the thinker's cultural upbringing, prior beliefs, and familiarity with subject which allows the thinker to evaluate with plausibility, factors and hypotheses and point out anomalies. For instance, a student excerpt has commented that "*I think debate helps me with a lot of things, and as a result of having to be critical thinking all the time I debate, I am able to determine and evaluate things in life more critically and carefully*", while others have mention that "*Debate has helped me to become better at critical thinking. I am better in recognizing and evaluating arguments that is happening around me, even in work place*".

Thus, in relation to this study's findings and related previous research case studies, the implementation of this study, particularly during the predebate phase where prior knowledge is obtained, improves the students' critical thinking skills in terms of evaluating argument under the RED model.

Drawing conclusion

The last factor of the RED model is drawing conclusion, which portrays an individual's ability to bring various different information gathered together and arrive at a conclusion in a logical flow with all the given evidence. This factor, alongside with the aforementioned two factors, mirrors Fisher's (2001) and Diane Halpern's (1994) categorization of critical thinking skills. In the study, the independent research, acting as a follow up to the lecture video and the introductory video, allow students to obtain argument analysis skills, which includes identify premises (reasons), counterarguments, and conclusions. This assists the student in obtaining critical thinking skills in terms of conclusion drawing, and allow for students to logically arrive

at a conclusion in accordance to the identification and evaluation of the arguments. As such, these independent exercises are consistent with Fisher's (2001) and Diane Halpern's (1994) categorization of critical thinking skills, namely, Fisher's (2001) "identify the elements in a reasoned case, especially reasons and conclusions", and Diane Halpern's (1994) "seeking converging evidence to increase confidence in a conclusion". Furthermore, according to Friedler et al. (1990), Koslowki (1996), and Willingham (2007), critical thinking is intrinsically tied to domain-knowledge and thus limiting critical thinking in the field with which the learner was not familiar.

In relation to drawing conclusion of the RED model, critical thinking can be expanded and improved when students obtains prior knowledge to that specific topic and analyze such knowledge through independent research, and thereby familiarizing themselves with the topic through the predebate phase under flipped learning environment of DIFLE. Moreover, with Siemen's (2005) confirmation that self-study is more effective, prior knowledge obtained through the predebate phase allows the student to draw conclusions in a more critical way to support their in-class activities and debate during the debate instruction. In this respect, students have shown positive feedback and results for this study, as they have mentioned that the predebate phase allows for them to not only obtain prior knowledge, but they were also able to identify, analyze, and come to a conclusion through the assistance of online materials and independent research. From the focus-group interview and open-ended questionnaire for instance, one of the excerpts of a student has emphasized that "*I think the independent research and the videos truly learn how to analyze a case, and I was able come to a conclusion based on my own idea after being exposed to these materials*". In relation to this study's findings and related previous research case studies, the implementation of this study, particularly during the predebate phase where prior knowledge is obtained and in-class activities and debates through debate delivery and postdebate phase, improves the students' critical thinking skills in terms of drawing conclusions under the RED model.

Thus, through the assessment of the student's critical thinking skills by using the RED model, the acquisition of prior knowledge under a flipped learning environment in DIFLE and debate instruction through debate delivery and postdebate phase has a positive impact on the students critical thinking skills. Furthermore, various

previous researches, case studies and surveys, as well as the findings results and feedbacks from the students have shown that the predebate phase in the acquisition of prior knowledge have achieved students being able to recognize assumption, evaluate argument, and drawing conclusions on their own at the most fundamental level before entering into the debate delivery and postdebate phase. To this end, in relation to prior knowledge, the implementation of DIFLE has a positive impact on the critical thinking skills of the students.

5.3.2.2 Link between evaluation of arguments (critical thinking) and emphasis of ideas

Amongst the findings in Chapter 4 regarding the descriptive statistics pretest and posttest of analyzing English speaking abilities and critical thinking skills, the descriptive statistics of critical thinking: *evaluation of arguments* and speaking strategies*: emphasis of idea* showed rather outlier results in comparison to other categories. Under *evaluation of arguments*, the mean scores for pretest and posttest were 4.21 and 4.64, respectively, conveying a mere 0.43 increase in the mean score, while other descriptive statistics depicts an increase of more than 1. Moreover, while other categories contained less than 4 negative ranks in the Wilcoxon Signed-Ranks Test, evaluation of argument displayed 9 negative ranks and 13 positive rank, which is clearly higher numerically than the other categories. Similarly, the category of *emphasis of idea* conveyed similar outlier results. The mean scores for pretest and posttest were 3.42 and 4.08, respectively, displaying a mere 0.66 increase in the mean score. Furthermore, the Wilcoxon Signed-Ranks Test for emphasis of idea showed 5 negative ranks and 14 positive ranks, which also shows higher number of negative ranks than other categories. There are two reasons for such outlier results, as discussed below.

Firstly, there are general linkage between speaking abilities and critical thinking skills. Generally, the more the students are stimulated and exposed with interactive questionings and analytical activities, the more opportunities they will obtain to express their thoughts vocally, and thus increases their speaking abilities (Wang, Spencer, & Xing, 2009). However, in the case of this study, there are specific linkage and connection between the evaluation of arguments and emphasis of idea. Evaluation of arguments describes the ability to analyze the given information and argument

objectively, which involves the constant questioning of the legitimacy of the supporting authorities and evidence, and have self-awareness of the emotions that may influence that information. Conversely, emphasis of ideas describes the ability to clearly emphasize their ideas and their relations, with persuasive paraphrasing, which reflects Brown's (2004) macro skills, particularly directed to the item of "able to emphasize key words, rephrasing, and providing context for interpreting the meaning of words". In this respect, the constant evaluation and analysis of the given topic and argument enhances the knowledge of that particular topic, which allows students to form their own analytical evaluation. With the formation of self-evaluation, it is easier for them to correctly express and emphasize key points and key words in order to deliver the evaluation vocally with persuasiveness (Bora, Borude, & Bhise, 2012). Thus, such a specific linkage also parallels to Wang (2009), where an enhancement of critical thinking leads to the improvement of speaking abilities in general. Therefore, as the elements of emphasis of idea and evaluation of arguments are linked, it is natural that both descriptive statistics contained similar outlier results.

Secondly, upon closer inspections of the means scores for both elements, it is noticeable that the mean scores were already high in the pretest. Specifically, the pretest scores for both evaluation of argument and emphasis of idea were 4.21 and 3.42, with a mere 0.43 and 0.66 increase, respectively. Furthermore, as aforementioned, the negative ranks in the Wilcoxon Signed-Ranks Test for both evaluation of argument and emphasis of idea were 9 and 5, respectively. As the mean scores were already high, coupled with the fact that emphasis of idea is an advanced speaking skills that is connected to evaluation of arguments, there were not much areas and capacity for improvement, thus possibly explaining the minimal increase of 0.43 and 0.66 for evaluation of arguments and emphasis of ideas between the pretest and posttest.

5.3.3 The students' opinion towards DIFLE

The results from the opinion survey questionnaires and focus group interview consists of positive results of the students that have participated the Debate Instruction in Flipped Learning Environment (DIFLE) program. The overall mean score of the opinion survey questionnaires were all 4 or above, suggesting their general satisfaction with DIFLE. Specifically, the opinions of the students in both opinion survey questionnaires and focus group interview shall are comprised of three components, namely, the (i) affective, (ii) cognitive, and (iii) behavioral. This aforesaid composition is based on the studies of Triandis (1977), Liaw (2007) and Jain (2014), in which all three studies are based on the three composition and division of opinion. As such, the three components of opinions in relation to this study shall be discussed under (i) the students' overall opinion of DIFLE, (ii) students' opinion on English speaking skills, and (iii) students' opinion on critical thinking skills.

5.3.3.1 Three factors of opinion: affective, cognitive, and behavioral

5.3.3.1.1 Affective opinion

The affective component is closely associated with neural representation, which reflects the emotional, mood and feeling segment of an opinion, and the expression of emotions are surfaced and reacted upon external factors derived from an individual's values and beliefs. There are 39 reported opinion related to the affective opinion of DIFLE in both the open-ended questionnaire and focus group interview. Among the 39 reports, 21 opinions were reported to be "negative affective", while the others are "positive affective", thus statistically confer that the students generally have a positive affective opinion towards DIFLE. The affective opinion component has the least positive reports. Each affective opinion entails different perspective of thoughts in terms of speaking ability and critical thinking skills. Thus, both factors shall be discussed extensively.

Proving the success of DIFLE in improving the students speaking ability, the students have acknowledged and expressed their noticeable improvement in them in the affective opinion sector. The data also shows that the students' speaking abilities are enhanced and significantly improved throughout the whole session of

DIFLE. Specifically, the students have particularly mentioned their affective perspective regarding their improvement of their speaking abilities through this study.

English Speaking Abilities

The students now believe that their out-of-class study session of DIFLE have rendered them more prepared and ready to deliver speeches, due to their expansion of knowledge and debate techniques learnt outside of class. Furthermore, the in-class activities, handouts, and debates have directly improved the student's speaking skills throughout the DIFLE program, due to the practical implementation of the knowledge that they have collected prior and during the debate delivery phase. One of the excerpts of the students read that "*The teaching style includes studying by myself, and I can really see how this helps me with my actual speech*", thus suggesting that such a flipped learning environment does benefit the students in terms of speaking ability. Moreover, another excerpt reads that "*I like the way that we can express our opinions, thoughts, and ideas independently. Since there's no right or wrong answers, I'm able to express my thoughts freely*". This opinion correlates with Baleghizadeh and Shahri (2015), who stated that speaking ability is intertwined with the speaker's capacity of knowledge of the topic and vocabulary skills. The aforementioned study is to be complemented in conjunction with Liaw et al. (2005), which emphasizes that learners accelerates their learning when external factors such as multimedia instructions are concerned. This suggests that the DIFLE program have helped the students create a learning environment and boost their speaking abilities through external factors, such as online materials and in-class activities as well as debate rounds have created a positive impact to their speaking abilities.

Critical Thinking Skills

In terms of the critical thinking skills in the DIFLE program, the students have acknowledged and expressed their noticeable improvement in them in the affective opinion sector. The data also shows that the students' critical thinking skills are enhanced and significantly improved throughout the whole session of DIFLE. Specifically, the students have particularly mentioned their affective perspective regarding their improvement of their critical thinking skills through this study.

In this respect, in terms of the critical thinking ability, the students believe that their out-of-class session of DIFLE, as well as their in-class activities and debate have increased their critical thinking skills as a whole, when combining the flipped learning environment and debate environment. Moreover, the in-class sessions and debates have also improved the students' speaking skills throughout the DIFLE program, as it teaches various meta-cognitive tasks, which is seen by Kennedy et al, (1991) as crucial to transferability to critical thinking skills. This essentially emphasizes the importance of priming students with domain knowledge prior to activity that involve critical discussion of the program. The student, in this case, reported that DIFLE have helped them through case construction, analytical skills, and other various critical thinking skills. This concurs with the study by Yang and Wu (2012)to which they emphasized the significance and importance of giving students time to think and engage in ideas with group members for better results in critical thinking skills, and Sanjya et al. (2014) added that students' critical thinking skills would be enhanced after debate instruction. According to several excerpts from students of the open-ended questionnaire and focus group interview, they have mentioned that DIFLE have helped people to think with reason, and that debate helps them more in critical reading, and makes them more confident. This correlates with the study of Gay (2010), where students have positive affective opinion towards flipped learning environment because it is less stressful and gives more time to students to enhance their critical reading skills.

5.3.3.1.2 Cognitive opinion

The cognitive component is associated and related to an individual's mental belief and disbelief about something and have towards an external object. There are 38 reported opinion related to the cognitive opinion of DIFLE in both the open-ended questionnaire and focus group interview. Among the 38 reports, 11 opinions were reported to be "negative cognitive", while the others are "positive cognitive", thus statistically confer that the students generally have a positive cognitive opinion towards DIFLE. This component consist of the highest positive reports. Each cognitive opinion entails different perspective of thoughts in terms of speaking ability and critical thinking skills. Thus, both factors shall be discussed extensively.

Proving the success of DIFLE in improving the students speaking ability, the students have acknowledged and expressed their noticeable improvement in them in the cognitive opinion sector. The data also shows that the students' speaking abilities are enhanced and significantly improved throughout the whole session of DIFLE. Specifically, the students have particularly mentioned their cognitive perspective regarding their improvement of their speaking abilities through this study.

English Speaking Abilities

In this regard, the students are aware, and believed that DIFLE is a useful program for them to enhance their speaking abilities, and the students have claimed that this study have assisted them in forming better sentence structure, as well as the flow of their speeches while delivering debate speeches. This is in line with Liaw et al. (2005), which provides that learners accelerates their learning when external factors such as multimedia instructions are concerned. Moreover, other external factors such as in-class activities and debates are also essential factors that assist students in improving their speaking ability. One of the students excerpt reads that "*I feel like while the videos gave me a lot of different perspectives, it is the actual debate that helped me on speaking skills the most*", as well as "*It helped me a lot. Some of the videos about the topics opened my eyes and made me think a lot about certain things*". The responses of the students correlates with the study of Flum and Kaplan (2006), which suggests that students who show interests in the topic, activity and classroom environment were more focused on skill development, thus leading to more exploration of overall aspects of learning . This suggests that students are indeed aware, cognitively, of their improvement in terms of speaking abilities, as those who watched the online materials are eager to learn more through the actual debate, and ultimately improved themselves through debate rounds and in-class activities.

In terms of the critical thinking skills in the DIFLE program, the students have acknowledged and expressed their noticeable improvement in them in the cognitive opinion sector. The data also shows that the students' critical thinking skills are enhanced and significantly improved throughout the whole session of DIFLE. Specifically, the students have particularly mentioned their cognitive perspective regarding their improvement of their critical thinking skills through this study.

Critical Thinking Skills

In terms of the critical thinking skills, the students believe that not only their out-of-class session of DIFLE have assisted them in critical thinking skills in a major way, the in-class activities and debate have also portrayed a positive impact as a whole, when the flipped learning environment and debate have been combined together. In this regard, the students have showed awareness in terms of their improvement in their critical thinking skills, which is in line with Kennedy et al. (1991) where various meta-cognitive tasks, such as group work and handout activities are crucial in transferring and developing critical reading skills to the students. Furthermore, as aforementioned, Yang and Wu (2012) and Sanjya et al. (2014) further expresses the significance of giving students time to think and engage in ideas with group members for better results in critical thinking skills ,and such skills can ultimately be improved after debate instructions. In this respect, as per several cognitive opinions from the students of the open-ended questionnaire and focus group interview, they have mentioned that the essential components of DIFLE, such as the online video clips and the actual debate have helped them the most. For instance, in one of the excerpts, the student expressed that "*I feel like while the videos gave me a lot of different perspective, it is the actual debate that helped me on critical thinking the most*". Thus, this correlates with Liaw (2002), who states that external factors, such as multimedia programs, e-learning and the combination of classroom learning helps the students to be aware and acknowledge the positive impact that it has towards their skill development and learning progress.

5.3.3.1.3 Behavioral opinion

The behavioral component reflects the intention of a person leading to response tendencies and overt actions when exposed to an external object (Triandis, 1977). The behavioral component has the highest reported numbers with 39 in total in both the open-ended questionnaire and focus group interview. Among the 39 reports, there are 13 reports that are reported to be "negative behavioral", while the others are "positive behavioral", thus it statistically confer that the students generally have a positive behavioral opinion towards DIFLE. The behavioral opinion has the second highest positive behavioral reports. Each behavioral opinion entails different perspective of

thoughts in terms of speaking ability and critical thinking skills. Thus, both factors shall be discussed extensively.

Proving the success of DIFLE in improving the students speaking ability, the students have acknowledged and expressed their noticeable improvement in them in the behavioral opinion sector. The data also shows that the students' speaking abilities are enhanced and significantly improved throughout the whole session of DIFLE. Specifically, the students have particularly mentioned their behavioral perspective regarding their improvement of their speaking abilities through this study.

English Speaking Abilities

In terms of the speaking ability, students are reported to believe they are able to apply the materials and skills they have acquired through the DIFLE program to everyday life situations, particularly in presentations, colloquial conversations, and in debate speeches as well. This is due to the predebate, debate delivery and postdebate phase which acts as different stages of training for students speaking abilities. One of the excerpts of the students read that "Debate changed the way I spoke. Before I cannot even make it to a 1 minute speech. Now I can speak a lot more. I think it is because I feel more comfortable communicating with others and are better in expressing myself. I feel like what I say matters." This suggests that the students have commented on their behavioral change after the DIFLE program, and it has changed the student positively. This correlates with Zare and Othman (2013), who states that debate gives beneficial outcomes to students in the area of confidence, as well as speaking ability. This suggests that DIFLE study does change the behavior of the students, to which, in this case, the students have showed positive behavioral response to it.

In terms of the critical thinking skills in the DIFLE program, the students have acknowledged and expressed their noticeable improvement in them in the behavioral opinion sector. The data also shows that the students' critical thinking skills are enhanced and significantly improved throughout the whole session of DIFLE. Specifically, the students have particularly mentioned their behavioral perspective regarding their improvement of their critical thinking skills through this study.

Critical Thinking Skills

In terms of the students' critical thinking skills, the students have believed that their out-of-class session of DIFLE have significantly improved their critical skills in a major way, and the in-class activities and debate also have a major positive impact as a whole. The students have showed behavioral responses in response to the DIFLE study, particularly showing their improvement in their case construction, argumentation identification, and rebuttal skills. This finding correlates with Sanjya et al. (2014), which states that critical thinking skills could be improved after debate instructions and in-class activities. In the open-ended questionnaire and focus group interview, students have showed behavior change as a response after their attendance of the DIFLE program.

In conclusion, although there's 45 negative reports out of 116 in both the open-ended questionnaire and focus group interview, the overall opinions of the students are generally positive based on the affective, cognitive, and behavioral components of the opinion. However, it should be noted that such negative reports are easily predictable, since many studies showed that numerous factors such as personal preference, gender or cultural background comes into play when one prefers certain pedagogy (Belenky et al., 1986; Gay, 2010; Tannen, 1992). While some students found the teaching method to be less stressful because it gives more time to students, others saw it as time-consuming and some still hold belief that debate creates conflict. However, the student opinions regarding the DIFLE program are generally positive.

5.3.3.2 Differences in opinion survey questionnaire and focus group interview

As aforementioned, the results from the opinion survey questionnaires and focus group interview consists of positive results of the students that have participated the Debate Instruction in Flipped Learning Environment (DIFLE) program. Specifically, in the open-ended questionnaire sector of the opinion survey questionnaire, there were a total of 37 positive results and 31 negative results, while the focus group interview comprises of 32 positive results and 14 negative results. The stark numerical contrast of the negative results between the open-ended questionnaire and focus group interview would suggest that the open-ended questionnaire invites for

negative results and students are more inclined to respond negatively when it comes to open-ended questionnaires. However, upon closer inspection, students were in fact more inclined to respond negatively during the focus group interview, despite the fewer negative report amount in comparison to the open-ended questionnaire. The reason for this explanation is discussed below.

Open-ended questionnaires requires a handwritten response to the questions that are imprinted in the opinion survey interview, while the focus group interview is conducted in person, where students are required to answer the interview questions orally. In the open-ended questionnaires, all the questions are either explicitly asking for positive responses or explicitly asking for negative responses. For instance, "What do you like the most about DIFLE course?" directly calls for positive answers only, to which students can only respond positively. Thus, as a result, out of the 18 responses reported, all 18 comprised of only positive responses for that specific question. Likewise, the question of "What do you like the least about DIFLE?" inherently demands only for negative responses, thus resulting in all 16 responses specific to that question are all negative responses. In other words, there is a clear distinct contrast in questioning, and does not contain questions that allows students to provided either a positive or negative answer.

Conversely, the focus group interview contains 13 questions with 9 follow up questions that contain questions that calls for a broader response. For instance, questions such as "What was the difference between your experience in DIFLE and other classes?" and "Is there anything else you want to share about your experience in DIFLE?" enables the possibility to reply with a positive or negative response. Despite the case, the responses were still positive. However, it is until the follow up questions were asked that they have started providing some negative opinions. For instance, follow up questions such as "What were the less interesting topics in DIFLE?" and "Are there any aspects of the online videos that you did not like?" contained some negative responses from the students.

Another reason for the conspicuous difference between the open-ended questionnaire and the focus group questions may be related to other external factors, such as cultural influence and personal reasoning. As aforementioned, there were more negative responses from the focus group interview in comparison to the responses from

the open-ended questionnaire. Firstly, cultural influence may be affective to the students, as direct criticism or negative feedbacks are normally not within their cultural normalization. Thus, this may be the reason for the student's silence of criticism in the open-ended questionnaire, and are only willing to express their negativity upon direct request for negative response, or upon face-to-face interview, which is the focus group interview in this case. Secondly, the 9-session DIFLE program was offered for free for the students, and perhaps such financial-free benefits rendered the students silence on negative criticism, as they feel obliged to not express any upsetting comments.

To this end, it is conclusive that the students' opinion in the focus group interview consist of more noticeable negative responses in comparison to the open-ended questionnaire. Such findings raises an interesting concern, as the students seem to only provide negative feedbacks when they are suggested with a negative-based question, as provided in the focus group interview. This may be due to the fact that the DIFLE study is a pioneer study, as there are no other studies which combines debate instructions in a flipped learning environment, and there are no other standards to compare to, thus, students inherently do not know what standards to consult to, leading to their hesitation in responding negatively to this study. In this case, the open-ended questionnaires calls for negative reviews, while the focus group interview contains follow up questions that suggests for negative response, to which the students only responds negatively when such question is raised.

5.4 Implications and Recommendations

According to the results of the study, the Debate Instructions in Flipped Learning Environment (DIFLE) is depicted and characterized as an approach that can improve and enhance the speaking abilities and critical thinking skills among the students from Thai schools with two years of English Program (EP). Thereby, integration of this module into English speaking classes are highly advised. The following suggestions are derived from the research findings for research individuals and instructors who wish to implement DIFLE into their English speaking classes for the students.

5.4.1 Implications and recommendations for instructors

In pursuant to previous case studies, surveys, findings, reports, and discussions, DIFLE depicts a promising improvement in the students' speaking ability and critical thinking skills. Therefore, some pedagogical implications for instructors who plans to use DIFLE in their English speaking classes are structured out below as follows.

5.4.1.1 Implication and recommendation for the integration of debate instructions

As aforementioned, the promising improvement in the students' speaking ability and critical thinking skills are found to be effective, due to the noticeable development of such skills of the students to a significant level. Thus, it suggests that debate instruction has positive impacts on improving the students' speaking abilities (Klungthong, 2011, Clark and Clark, 1977) and critical thinking skills (Bonwell & Eison, 1991; Sanjya et al., 2014). Furthermore, debate instructions have been utilized by various studies, such as Alasmari and Ahmed (2013), Agustiawati et al. (2015), and Trumposky (2004). In this respect, it is highly advised for any English speaking instructor teaching high school students with two years of EP program to adopt and apply DIFLE's debate instructions in the classroom. Specifically, English speaking instructors should pay close attention to the three stages of debate instructions, derived from the Broad Participant Model (BPD), which are (i) predebate phase, (ii) debate delivery phase, and (iii) postdebate phase.

Predebate phase

The aim of the predebate phase is to familiarize the students with debate concepts, specialized topics, as well as follow up independent researches for self-study and evaluation purposes. This familiarization process is accompanied with (i) instructional videos, (ii) lecture videos, and (iii) independent researches. The goal of these online materials is for students to self-study the concepts and details of the debate rules and specialized topics in order for them to be knowledgeable and analytical towards such topics. Siemens (2005) emphasizes that, with the growing technological advancement, students that self-studies at their own pace is more likely to seek for

further inquiry into the subjects of their interests. In this regard, the videos and independent research is designed to facilitate the students in understanding the topic and rules of the debate, in order to enhance their speaking abilities and critical reading skills. The following implications below are specific recommendations for instructional videos, lecture videos and independent researches.

Firstly, the instructional videos are online videos that educates and teaches the students the basic rules and concept of a debate round. Each instructional videos throughout each section of DIFLE program focuses on different parts of a debate round, such as the basic format of a debate, case construction, speech construction, argumentation identification, and so on. Although Siemens (2005) mentions the effectiveness of self-study, the instructional videos are usually focused on the technicality of the debate round, and thus may be unpleasant and difficult for certain students to watch through the entire instructional videos for the whole DIFLE program. Thus, it is advised that such videos be made shorter, more concise, with actual samples and visual aids of the technicalities of a debate. For instance, in instructional videos regarding case constructions, it can include an actual speech of a developed case, with a structured speech that highlights the focal points regarding case constructions. Not only will this addition reduce the risk that the students will avoid watching instructional videos, but the addition of sample speeches and visual aids will facilitate the students in having a deeper and a more complete understanding of the subject matter.

Secondly, the lecture videos are online video clips that has educational and informative background matters regarding a certain topic. Each lecture videos throughout each section of DIFLE program focuses on different topics, such as death penalty, political issues, and so on. In this respect, Strayer (2007) mentions that the combination of out-of-class materials and in-class activities would create a learning environment, and such a learning environment would be stimulating to the students speaking abilities and critical reading skills. In this case, the lecture video serves as a crucial out-of-class material, as the lecture videos serves as a knowledge pack that allows students to know and familiarize themselves with the certain topic, in order to excel in their speaking abilities and critical thinking skills. Not only are the lecture videos imperative, it is considered less-plain and dull in comparison to its counterpart, the instructional videos. Henceforth, it is recommended for instructors to search and

assign longer, and more informative video clips in order for students to truly understand the materials. The extension of longer lecture videos will increase the chances for the students to understand the topic better, and thus able to expand their knowledge regarding their materials, and ultimately increase their critical thinking skills and speaking abilities.

Lastly, the independent research are the online exercises that serves as the follow up questions and critical thinking issues that complements the instructional and lecture videos. In this case, after the students have completed watching the instructional and lecture video clips, the students must complete a series of questions that stimulates their argumentation and critical thinking skills. For instance, after watching a video clip regarding death penalty, students will be assigned with independent research questions that includes but not limited to revolves around the ways to further support death penalty, and what are some conclusions that can be drawn in regards to the premises that are presented. This stage of predebate phase is of upmost importance, as independent researches serves as the practical implementation of the pre-acquired knowledge and skills, and encourages further self-research regarding the topic. Thus, it is highly advised that instructors emphasize on the independent research assignment, and ensure that the questions and problems assigned to the students are critically stimulating, and requires deep thinking and knowledge.

Debate delivery phase

The aim of the debate delivery phase is to stimulate and expose the students to active in-class activities, such as handouts, group work and debate that would ultimately be beneficial for the student's speaking ability and critical thinking skills. With the existence of pre-acquired knowledge from the predebate phase in each student, the instructor must ensure that each student will be engaged in class activities, and utilize the topic knowledge and debate rules creatively in order to create a stimulating learning environment (Strayer, 2007). In this regard, in order to fully realize the potential of DIFLE, instructors are advised to pay close attention and manage three factors during the debate delivery phase, which are (i) positive encouragement, (ii) passive supervision and regulation, and (iii) time management.

The debate delivery phase is a crucial stage for students to improve on their critical thinking skills and speaking ability. Thus, the instructor's presence and active encouragement is strongly recommended. In this regard, instructors must give positive encouragement, which refers to the instructor's active role in encouraging the students in various ways. Particularly, as DIFLE consists of three debate rounds in total, during the first debate round, it is more likely that the students will be nervous and be less likely to deliver speeches in a confident way. Thus, instructors are advised to encourage them to speak, and ensure that the student can be more eased to deliver speeches. Instructors are not to discourage the students, or negatively provoke them that has equivalent effect of discouragement. Furthermore, the instructor is advised to ensure that in each debate round, the students are seated in the correct order of arrangement in accordance to the rules of the debate. Moreover, during the debate, the instructor are recommended to encourage the students to engage with each other through point of information (POIs) and active rebuttals, so as to ensure that the students remains active during the actual debate round. Ultimately, throughout the whole debate delivery phase, whether it is in-class activities are debate rounds, the instructor must ensure and encourage the students to support each other in a positive way, which, in this sense, "assist" the instructor in encouraging each students to be active.

Passive supervision refers to the instructor's role in supervising the class, ensure that not only every students are active during class, but also must ensure that the class is within schedule and the structure of the class is in accordance to the pre-set plan of DIFLE. Particularly, the instructor are advised to inform, before every debate round, that other students who are watching the debate must actively take notes and listen, as the debate round will be discussed later in the postdebate phase. A simple informing action by the instructor can benefit the students in helping them stay active during the debate round, and thus engage in postdebate activities that would enhance their speaking abilities and critical thinking skills. Furthermore, the instructor must also ensure his administrative accuracy, where the videos must be consistent with the topics assigned, in order to make sure that the program does not fall into delay. Lastly, the instructor are recommended to actively monitor the time limit of each speaker, which is 5 minutes, as to ensure that the classes are not unnecessarily delayed.

Postdebate phase

The aim of the postdebate phase is to act as the concluding phase of the DIFLE program, to which students are to reflect upon their acquired knowledge and skills. Cheong and Cheung (2008) emphasized that the intertwined discussion between peers and the instructors would employ for an improvement in student's performance in general, which includes speaking ability and critical thinking skills. It is thus the instructor's role to ensure that students participate actively in the postdebate phase, and is recommended for such instructor to stay active in this phase as well. In this regard, in order to fully realize the potential of DIFLE, instructors are advised to pay close attention and manage (i) critical reflection and (ii) others

The predebate and debate delivery linkage refers to the instructors role to link and review the materials learnt out-of-class, as well as in-class knowledge and activities, and provide a general feedback to the students. In particular, the instructors are highly recommended to place high emphasis on the video contents that were assigned during the predebate phase, how the information of such video contents can be utilized creatively during the debate, and provide feedbacks on how the students can better structure their case and their pre-acquired knowledge. It must be emphasized that postdebate phase is a group-discussion led by the instructor, thus it is the instructor's role to ensure every student are able to participate in this group discussion. This recommendation is in line with Zare and Othman (2013), who stated that classroom debate and discussion acts as a systematic instructional strategy which has the potential to engage students in active learning, promotes critical thinking skills, give deeper understanding of course content, and improves speaking abilities. Moreover, it is recommended that the instructor pose post-debate critical thinking questions, and give hypothetical arguments for students to reflect upon. Other recommendations include instructors' role in commenting on the style and presentation method of the students in order for them to improve, as well as arranging the seats in a way that everybody have an equal chance of participation.

5.4.1.2 Implications and recommendations for flipped learning environment

Flipped learning environment has displayed advantages for both instructors and students in Debate Instructions in Flipped Learning Environment (DIFLE). The students' out-of-class, self-learning approach from online materials through technological means allow the students to learn at their own pace without being forced to follow the instructor's pace, hence increasing their capacity in improving critical thinking skills and speaking ability. Also, the teaching method of debate instruction as a follow up to the out-of-class assignments by the instructor not only allows the instructor to only focus on activities and practical implementations, students benefit by such teaching method and hence enhances their speaking ability and critical thinking skills.

In this respect, the flipped learning environment is to facilitate the students' learning is required. To promote the students' skills in learning with technology, the instructor should apply flipped learning environment in appropriate concepts that relate to the learning goals, resources, and environment. The concepts are (i) the incorporation of web-based technology to accomplish an educational goal; and (ii) the combination of pedagogical approaches required to produce the best learning outcome. This selection of flipped learning environment concept that correlates with the learning objectives will benefit the students in terms of learning achievement, and they will be able to apply it to pursue the knowledge required for their personal or professional purposes.

Traditional classroom methods have always been the norm and standardized teaching method, but in terms of specific debate instruction and English speaking classes, traditional classroom teaching methods may not be sufficient due to the fact it is, by nature, highly time restrictive. In this modernization era, technological tools play an important role in self-learning and self-realization, thus renders the flipped classroom approach possible. According to Bonwell & Eison (1991), flipped classroom opens up a whole range of new possibilities for instructors to create more interactive class activities and to create more effective student engagement and learning environments. Furthermore, flipped classroom approach is especially efficient in this digital era, with the convenient access to multi-purpose smart phones and other

technological devices. Thus, with the aforementioned possibilities, the instructor is advised to fully utilize the current technological tools and advancement to maximize the capability of flipped learning environment. In this respect, several recommendations are highlighted, as described below.

Firstly, the instructor should ensure the usage of the most convenient technological tools for the ease of accessibility to the students. In particular, in the DIFLE study, the instructor must ensure that each instructional and lecture video URL are properly uploaded and ready via Google Drive, as well as any follow up exercises and online handouts that relates to the videos. Furthermore, It is important that the instructor emphasizes the significance of independent researches be done not only through the online videos that are posted, but also through other self-research platforms, such as Google, Yahoo, and Baidu. Specifically, the instructor should emphasize that the usage of smart phone devices and other tools, such as iPads, tablets and laptops are encouraged to promote efficiency and convenience during self-study sessions. According to the students in the open-ended questionnaires and focus group interview, they have expressed their satisfaction with the self-study method through online means, and thus, it is important that the instructors insert emphasis on the convenience and effective utilization of technological tools to the students.

Secondly, as the instructor is not able to physically supervise and monitor the students during off-class periods, it is strongly encouraged for the instructor to create incentives for the students to complete their assigned works during the predebate phase, which includes watching online videos and completing their independent research tasks. Instructors can achieve this through the creation of online forms for students to fill in once they have completed their tasks, as well as through classroom feedbacks during postdebate phase to emphasize the significance of completing the online assignments. Although a full assurance for students to complete their online tasks are unlikely, this method would increase the percentage for students to complete such tasks.

Thirdly, during the debate delivery phase, aside from assuring that the class relates to the videos that were posted online, the instructor is also advised to ensure that the classroom is activity-based, that is to say, the main style of teaching by the instructor is through various activities that would ultimately stimulate and enhance the critical thinking skills and speaking abilities of the students. Thus, the classroom environment

should be student-friendly, and ultimately create a positive, stress-free environment that would attract the students to participate the classes with a positive attitude. Therefore, the personality of the instructor must appeal to the students as well. A negative-based minded instructor would not be advised to conduct such classroom activities.

5.4.1.2 Implications and recommendations on teacher qualifications

To successfully implement Debate Instructions through a Flipped Learning Environment (DIFLE), it is imperative and recommended for the instructor to pre-possess qualities that reflects the four pillars established by the Flipped Learning Network (2014), namely, flexible environment, learning culture, intentional content, and professional educator.

Flexible environment conveys the need for instructors to create flexible time and spaces where student can choose when and where they learn, whether it is in-class or out-of-class by means of technological assistance. Promoting flexible environment is an essential quality that the instructor is recommended to have, as DIFLE consists of in-class, as well as out-of-class learning and instructing in order for students to have the flexibility and enough time to self-educate themselves before attending the class. Instructors are also recommended to possess the quality of learning culture, in which it focuses on in-class time, where it is dedicated to explore topics in extended depth and create rich learning opportunities through various activities. In this case, instructors should actively promote continuous interactions of students and teachers through various activities, as well as the actual debate, where the instructors are to facilitate the smooth process of the debate. For instance, the DIFLE in-class session consisted of students who were not engaging in group activities, to which the instructor immediately encouraged such student to be involved by various means, including participating the group activity with the student.

Intentional content is the instructor's discretion to determine the materials that should be distributed and information that needs to be taught, and what needs to be taught by the teacher and what needs to be assigned for the students to teach themselves. In this case, the instructor is recommended to promote the quality of intentional content by distributing the correct and accurate materials to the students, and ensuring that all

students are aware of all the materials that are distributed to them. Lastly, the quality of professional educator depicts the demanding role and responsibility of the instructor, where during class time, they need to observe the students and provide them with instant feedback and assess their work constantly. Such quality is an integral piece to ensure the success execution of flipped classroom. For example, during the postdebate phase of the DIFLE session, some of the students were too afraid to express their opinion, to which the instructor immediately opened the floor for other students to voice their opinion while encouraging everyone to speak, thus promoting an overall friendly environment.

5.4.2 Implications and recommendations on students

The Debate Instructions in Flipped Learning Environment (DIFLE) is promising in terms of developing the students' speaking abilities and critical thinking skills. Thus, it is recommended that the students implement the DIFLE as the follows.

First, in order to enhance speaking abilities and critical thinking skills, the students should apply and participate in all stages of DIFLE program. Specifically, it is imperative that the students to complete all the instructional videos, lecture videos, and independent researches prior to the classes, and attend all classes and debate, as well as the postdebate discussions. This is because all three stages of DIFLE are inter-connected together in order to fully enhance the speaking abilities and critical thinking skills, and it is strongly advised against students to skip one particular phase. In this respect, the predebate phase is designed for students to obtain the necessary knowledge of a topic, as well as learn certain rules of the debate to have a general understanding of the materials given online, as well as self-conduct a critical analytical session of their own. Thus, this phase is needed to complement the debate delivery phase, to which the students are exposed to the practical in-class activities and debate rounds to implement their knowledge that was acquired during the predebate phase. Lastly, the postdebate is a discussion that serves as a conclusion and reflection of the previous two phases that the students have participated. Thus, it is advised for students to attend all three phases in order to significantly enhance their speaking abilities and critical thinking skills.

Second, since the debate delivery phase and postdebate phase conveys effectiveness in exposing the students to enhance their speaking abilities and critical thinking skills, it is recommended that the participating student have advanced level of English. As the DIFLE program facilitates the students in their speaking ability and critical thinking skills, the online contents and in-class activities cannot be understood and fully realized by a student that has a beginner level of English skills. Thus, it is critical that the participating students must have the pre-requisite of intermediate English skills with two years of EP experience. Furthermore, assuming that all the students satisfy the prerequisite, DIFLE program is also suitable for those students who wish to improve their speaking abilities, that is to say, those who wish to only focus on their speaking ability enhancement are also suitable to attend the DIFLE program.

Third, in terms of the flipped learning environment, the students are advised to make use of technology in their learning, with specifications to the convenient access to such technology, such as smartphones, laptops, tablets, and so on. The students should realize the appropriate use of media and technological tools in both their real life and their learning. Most importantly, the students should realize when to use and how to use technology to their benefit when they conduct their own self-study session.

5.4.3 Implications and recommendations to institutions

Although the DIFLE study is conducted in Kev's Academy, which comprises of students from the English Program (EP), such study is not only limited to certain EP students. Its applicability can be extended to other educational environment in Thailand, mainly, in (i) EP in Thai high schools, and (ii) Thai programs in Thai high schools. Given the right applicability and external factors of these educational environment, DIFLE can be implemented in both.

5.4.3.1 Implications and recommendations to EP programs in Thai high schools

The implementation of DIFLE to EP in Thai high schools can be implemented swiftly and naturally. Under the present educational program of EP, there are various existing debate clubs with qualified supervisors and coaches that supervises and monitors the club. Coincidentally, most of the supervisors and coaches of the debate

clubs are also English teachers of their respective schools. Thus, with DIFLE being naturally connected to debate with close inter-connectedness with the students, it is easier for the teachers of the EP programs to implement the study, as they are already familiar with such a teaching method through debate instructions of their respective debate clubs. Therefore, EP in Thai high schools is a suitable educational environment to implement the DIFLE program.

There are several practical recommendations of how EP in Thai high schools can implement this study. First, EP in Thai high schools are recommended to allocate their debate coaches to execute the DIFLE program, as they are normally familiar with using activities and engagement as a mean to promote classroom interaction and engaging culture, thus they can better carry out the program successfully. Second, with classes of varying sizes that exists within EP, the flipped classroom environment can be implemented immediately, regardless of the size of the classroom. Specifically, the principles for predebate phase of DIFLE can be used, which suggests that teachers can use social media and technological devices as a tool for students to complete pre-assigned assignments, such as learning and instructional videos, before class time. During class time, the principles of debate delivery phase can be immediately implemented, as the teacher may carry out activities and related workload that would engage students in the whole class, and ensure that eventually, every students will have an opportunity to express and vocalize their own opinions, either by way of answering a question or being asked to deliver a short speech. The principles of postdebate discussion can also be implemented, as teachers can host postactivity discussion in order for the teacher to evaluate the class, and have the students evaluate each other in terms of their newly acquired knowledge and analysis. Third, to accommodate this activity-based program, it is recommended for EP to create a double period (90 minutes) in order to maximize the successful implementation of DIFLE, allowing the teachers and students to engage with each other without any unnecessary rush of the class. Last, the DIFLE program is not limited to only English class, but it can also be extended to other subject areas of other classes, to which the flipped learning environment format can be implemented immediately through pre-assigned videos and homework, and postactivity discussions, as well as debate instruction if the teacher sees fit.

5.4.3.2 Implications and recommendations to Thai
programs to Thai high schools

As aforementioned, the DIFLE program can also be implemented to Thai programs in Thai high schools, specifically in major related class subjects, such as English class. However, unlike EP, certain factors must be taken into consideration. First, Thai program consist of more students in comparison to EP, with some class sizes of over 50 students, thus rendering the direct implementation of DIFLE program more difficult. Second, the English ability, both in the aspects of critical thinking skills and speaking ability, are less advanced in comparison to the students of EP program. Thus, it is noteworthy to emphasize that although DIFLE program is possible, such implementation should be gradual, and not immediate, in order to maximize the results of such study.

Referring to the abovementioned factors, there are several recommendations for Thai program in Thai high schools to apply the DIFLE study in their classrooms. Firstly, it is strongly recommended for Thai programs to implement the flipped learning environment first before implementing debate instruction. As Thai programs are more inclined to use the traditional classroom format, it is important that the teachers take the time to teach the students how to use the technology to gain access to online materials and online assignments, as well as teaching them how to conduct research in a professional manner. This training of the predebate phase would assist the students in critical thinking, teaching them how to self-study for a certain material without the direct assistance of the teacher. Second, the teacher should design simple activities during school time that would involve the whole class. While the teacher need not to divide the class into groups immediately, the activities should allow the students to engage in the class, and express their opinions in class. For instance, the teacher can assign each students to have a mini-talk about a certain topic that would last for 30 seconds or one minute, depending on class size, with the educational goal of providing an opportunity for all of them to practice speaking. Once the students start to familiarize themselves with speaking, then debate instructions can be introduced through gradual means. For instance, the teacher may open the floor for discussions, allowing the

students to speak for one minute, then implement rules to speak for additional minutes, and eventually host a debate round when the teacher sees fit.

Thus, DIFLE study is suitable for implementation in both EP in Thai high schools, as well as Thai programs in Thai high schools, given that such implementations also provides consideration for the external factors that exists within both programs.

5.5 Limitations

The limitations of the study can be acknowledged through issues of time, the flipped learning environment approach, and the sample size of the study. The issues are addressed as follows:

Though the study was conducted through the Debate Instructions in Flipped Learning Environment (DIFLE) approach with the purpose to enhance each student's critical thinking and speaking ability, only one student can deliver a 7 minutes speech at a time, and debate speeches could not be delivered simultaneously by multiple students. With the class period lasting for 3 hours and a class size of 24 students, not every student is able to maximize their learning experience through this study, as each class period does not last long enough to fit through debate speeches for every student. Thus, with only three actual debate delivery rounds in the 9 session program, the 24 students are unable to experience all three debate sessions. Even with the inclusion of out-of-class online material and post-debate discussions, it is not enough to fully realize the extent of the study, due to the reason that debate speech delivery is an integral part of the study to utilize the student's knowledge and skills into actual practice.

Additionally, as the study includes a "flipped learning environment" approach with assigned out-of-class online materials to students to complete prior to every class, there are no methods for the teacher to assess and ensure whether the students have completed the pre-assigned materials. Even though each class activities are based on the online materials, it is not possible to ensure that the students have completed their assignments, as the teacher is unable to supervise each student outside of the classroom. Thus, this study cannot be fully realized due to the fact that the completion of pre-assigned online tasks is based on the discretion of the students.

Lastly, the study sample was conducted on 24 high school students, which may not be sufficient to base a conclusion of a study based on such limited sample size. In

this case, the 24 high school students came from six different schools, while there are numerous other high schools and institutions across Thailand. A limited sample size of 24 high school students may lead to a skewed or inaccurate outcome of the study.

5.6 Recommendations for future studies

Further research study could be further improved and investigated, and below contain the following six recommendations for such further studies:

First, with the Debate Instructions in Flipped Learning Environment (DIFLE) study sample size being limited to 24 students from six different high schools, it is rather limited and does not provide an overview to the effectiveness of the study. Thus, it is recommended that the study sample size be expanded and diversify to not only other high schools, but it could extend to non-English speakers, elementary students, as well as university students to fully assess the effectiveness of the study.

Second, this study contains only a single group for the pretest and posttest assessment, therefore there are no basis to evaluate the effectiveness of this study in relation to other group. Thus, it is recommended that there be a control group and an experimental group. In this case, the control group will participate only in the pretest and posttest, while the experimental group will participate in the whole procedure, which includes the pretest, posttest, as well as the 9 class sessions. The results from both groups can then be compared and assessed in order to obtain a clear indication of whether the study is effective in terms of the student's critical thinking and speaking skills.

Third, the study does not contain any explicit teaching methods or assessment that directly trains critical thinking skills of the students. Specifically, the Watson-Glaser Critical Thinking Appraisal (WGCTA), as well as the various activities provided during predebate, debate delivery and postdebate phase is merely based on theories that such activities will improve student's critical thinking skills. Thus, it is recommended that further studies should provide explicit teaching of critical thinking skills in order for the students to be more aware of the skills they are practicing, as well as for a more accurate assessment to evaluate critical thinking skills.

Fourth, this study only focused on critical thinking and speaking ability, but did not explore upon other areas that conjuncts and relates to the said abilities, such as listening skills, thinking skills, and writing skills, which are significant sub-sets in relation to critical thinking and speaking ability. These skills are imperative in order to truly enhance student's critical thinking and speaking ability. Thus, it is recommended that further studies include teaching materials and activities that relates to the aforesaid sub-sets (listening, thinking and writing skills).

Fifth, there is an absence on explicit qualitative data to track and record student's development in critical thinking skills, and therefore students were not properly assessed regarding their critical thinking skills. Therefore, it is recommended in further studies that various forms of qualitative data assessments be employed in order to better assess the critical thinking skills of the students.

Last, the current structure of the study consist of a pretest at the beginning of the 9 session course, and conclude with a posttest to ultimately evaluate the effectiveness of this study. However, there are no "posttest" in-between the 9 sessions to gradually evaluate the students and form a visual trend for a complete assessment. Thus it is recommended for further studies that formative assessment be employed in order create an in-process evaluations of student comprehension regarding their critical reading and speaking ability

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APPENDIX

Appendix A: Pretest & Posttest

<u>Speaking Tasks</u>

1. Pretest for Speaking Ability

Instruction: Please read the following passage on animal testing. After finishing you will be asked by the evaluator about various arguments presented in this passage. This is an oral exam so both the questions and answer must be in speaking.

<p align="center"><u>Animal Testing</u></p>

An estimated 26 million animals are used every year in the United States for scientific and commercial testing. Animals are used to develop medical treatments, determine the toxicity of medications, check the safety of products destined for human use, and other biomedical, commercial, and health care uses. Research on living animals has been practiced since at least 500 BC.

Proponents of animal testing say that it has enabled the development of numerous life-saving treatments for both humans and animals, that there is no alternative method for researching a complete living organism, and that strict regulations prevent the mistreatment of animals in laboratories. Four reasons supporting the proponents are as follow: first, animal testing has contributed to many life-saving cures and treatments. The California Biomedical Research Association states that nearly every medical breakthrough in the last 100 years has resulted directly from research using animals. Experiments in which dogs had their pancreases removed led directly to the discovery of insulin, critical to saving the lives of diabetics. The polio vaccine, tested on animals, reduced the global occurrence of the disease from 350,000 cases in 1988 to 223 cases in 2012. Animal research has also contributed to major advances in understanding and treating conditions such as breast cancer, brain injury, childhood leukemia, cystic fibrosis, malaria, multiple sclerosis, tuberculosis, and many others, and was instrumental in the development of pacemakers, cardiac valve substitutes, and anesthetics. Chris Abee, Director of the University of Texas M.D. Anderson Cancer Center's animal research facility, states that "we wouldn't have a vaccine for hepatitis B without chimpanzees," and says that the use of chimps is "our best hope" for finding a vaccine for Hepatitis C, a disease that kills 15,000 Americans annually. If thalidomide had been properly tested on pregnant animals, its potential for

causing severe birth defects would have been discovered before the drug became legal for human use. Second, there is no adequate alternative to testing on a living, whole-body system. Living systems like human beings and animals are extremely complex. Studying cell cultures in a petri dish, while sometimes useful, does not provide the opportunity to study interrelated processes occurring in the central nervous system, endocrine system, and immune system. Evaluating a drug for side effects requires a circulatory system to carry the medicine to different organs. Also, conditions such as blindness and high blood pressure cannot be studied in tissue cultures. Computer models can only be reliable if accurate information gleaned from animal research is used to build the models in the first place. Furthermore, even the most powerful supercomputers are unable to accurately simulate the workings of complex organs such as the brain. Third, animals are appropriate research subjects because they are similar to human beings in many ways. Chimpanzees share 99% of their DNA with humans, and mice are 98% genetically similar to humans. All mammals, including humans, are descended from common ancestors, and all have the same set of organs (heart, kidneys, lungs, etc.) that function in essentially the same way with the help of a bloodstream and central nervous system. Because animals and humans are so biologically similar, they are susceptible to many of the same conditions and illnesses, including heart disease, cancer, and diabetes. Fourth, animals themselves benefit from the results of animal testing. If vaccines were not tested on animals, millions of animals would have died from rabies, distemper, feline leukemia, infectious hepatitis virus, tetanus, anthrax, and canine parvo virus. Treatments for animals developed using animal testing also include pacemakers for heart disease and remedies for glaucoma and hip dysplasia. Animal testing has also been instrumental in saving endangered species from extinction, including the black-footed ferret, the California condor and the tamarins of Brazil. Koalas, ravaged by an epidemic of sexually transmitted chlamydia and now classified as endangered in some regions of Australia, are being tested with new chlamydia vaccines that may stall the animal's disappearance. The American Veterinary Medical Association (AVMA) endorses animal testing.

Opponents of animal testing say that it is cruel and inhumane to experiment on animals, that alternative methods available to researchers can replace animal testing,

and that animals are so different from human beings that research on animals often yields irrelevant results. Four reasons against animal testing are as follow: first, animal testing is cruel and inhumane. According to Humane Society International, animals used in experiments are commonly subjected to force feeding, forced inhalation, food and water deprivation, prolonged periods of physical restraint, the infliction of burns and other wounds to study the healing process, the infliction of pain to study its effects and remedies, and "killing by carbon dioxide asphyxiation, neck-breaking, decapitation, or other means." The Draize eye test, used by cosmetics companies to evaluate irritation caused by shampoos and other products, involves rabbits being incapacitated in stocks with their eyelids held open by clips, sometimes for multiple days, so they cannot blink away the products being tested. The commonly used LD50 (lethal dose 50) test involves finding out which dose of a chemical will kill 50% of the animals being used in the experiment. The US Department of Agriculture (USDA) reported in 2010 that 97,123 animals suffered pain during experiments while being given no anesthesia for relief, including 1,395 primates, 5,996 rabbits, 33,652 guinea pigs, and 48,015 hamsters. Second, alternative testing methods now exist that can replace the need for animals. In vitro (in glass) testing, such as studying cell cultures in a petri dish, can produce more relevant results than animal testing because human cells can be used. Microdosing, the administering of doses too small to cause adverse reactions, can be used in human volunteers, whose blood is then analyzed. Artificial human skin, such as the commercially available products EpiDerm and ThinCert, is made from sheets of human skin cells grown in test tubes or plastic wells and can produce more useful results than testing chemicals on animal skin. Microfluidic chips ("organs on a chip"), which are lined with human cells and recreate the functions of human organs, are in advanced stages of development. Computer models, such as virtual reconstructions of human molecular structures, can predict the toxicity of substances without invasive experiments on animals. Third, animals are very different from human beings and therefore make poor test subjects. The anatomic, metabolic, and cellular differences between animals and people make animals poor models for human beings. Paul Furlong, Professor of Clinical Neuroimaging at Aston University (UK), states that "it's very hard to create an animal model that even equates closely to

what we're trying to achieve in the human." Thomas Hartung, Professor of evidence-based toxicology at Johns Hopkins University, argues for alternatives to animal testing because "we are not 70 kg rats." Fourth, drugs that pass animal tests are not necessarily safe. The 1950s sleeping pill thalidomide, which caused 10,000 babies to be born with severe deformities, was tested on animals prior to its commercial release. Later tests on pregnant mice, rats, guinea pigs, cats, and hamsters did not result in birth defects unless the drug was administered at extremely high doses. Animal tests on the arthritis drug Vioxx showed that it had a protective effect on the hearts of mice, yet the drug went on to cause more than 27,000 heart attacks and sudden cardiac deaths before being pulled from the market.

This article is an excerpt from an internet source. The full information is available online via http://animal-testing.procon.org/

Questions: Please answer the following questions.

Task 1: *Impromptu speech*. Please answer the following general questions. You will not have time to prepare your answer.

1. How many family members do you have?
2. Do you keep any pet at home?
3. Do you think people who have pets can empathize more with animal suffering?

As you might have guessed, we are going to talk on the topic of animal testing today.

Task 2-4 : Read the given passage and answer questions

Task 2: *Identify the strength and weakness*: Which one do you thinks is the strongest and weakest argument of both sides.

Task 3: *Focal and Peripheral point identification.* Please identify the main clash points and supporting details of the opponent to animal testing.

Task 4: *Roleplaying*. Imagine yourself as a Prime Minister of Thailand. You are about to give a speech to the audience in the parliament on the policy to ban animal testing. Please give a speech using a proper level of word appropriate to this situation

จุฬาลงกรณ์มหาวิทยาลัย

CHULALONGKORN UNIVERSITY

Speaking Tasks

1. Posttest for Speaking Ability

School Uniform

Traditionally favored by private and parochial institutions, school uniforms are being adopted by US public schools in increasing numbers. One in five US public schools required students to wear uniforms during the 2013-2014 school year, up from one in eight in 2003-2004. Mandatory uniform policies in public schools are found more commonly in high-poverty areas.

History of School Uniforms

The first recorded use of standardized dress in education may have been in England in 1222, when the Archbishop of Canterbury mandated that students wear a robe-like outfit called the "cappa clausa." The origin of the modern school uniform can be traced to 16th Century England, when the impoverished "charity children" attending the Christ's Hospital boarding school wore blue cloaks reminiscent of the cassocks worn by clergy, along with yellow stockings. As of Sep. 2014, students at Christ's Hospital were still wearing the same uniform, and according to the school it is the oldest school uniform still in use. When Christ's Hospital surveyed its students in 2011, 95% voted to keep the traditional uniforms. In later centuries, school uniforms became associated with the upper class. At one of England's most prestigious schools, Eton, students were required to wear black top hats and tails on and off campus until 1972, when the dress codes began to be relaxed. School uniforms in the United States followed the traditional use of uniforms established in England and were generally limited to private and parochial schools. One exception was found in government-run boarding schools for Native American children, first established in the late 1800s, where the children, who had been removed from their families, were dressed in military-style uniforms.

Debate over School Uniform

Proponents say that school uniforms make schools safer for students, create a "level playing field" that reduces socioeconomic disparities, and encourage children to focus on their studies rather than their clothes. Three reasons back up their the proponents claim: First, school uniforms may deter crime and increase student safety. In Long Beach, CA, after two years of a district-wide K-8 mandatory uniform policy,

reports of assault and battery in the district's schools decreased by 34%, assault with a deadly weapon dropped by 50%, fighting incidents went down by 51%, sex offenses were cut by 74%, robbery dropped by 65%, possession of weapons (or weapon "look-alikes") decreased by 52%, possession of drugs went down by 69%, and vandalism was lowered by 18%. A 2012 peer-reviewed study found that one year after Sparks Middle School in Nevada instituted a uniform policy, school police data showed a 63% drop in police log reports, and decreases were also noted in gang activity, student fights, graffiti, property damage, and battery. A 2010 peer-reviewed study found that schools with uniform policies had 12% fewer firearm-related incidents and 15% fewer drug-related incidents than schools without uniforms. A 2007 peer-reviewed study found that, in schools with historically higher rates of sexual violence, sexual attacks were less likely if uniform policies were in place. School uniforms also prevent students from concealing weapons under baggy clothing, make it easier to keep track of students on field trips, and make intruders on campus more visible. Frank Quatrone, superintendent in the Lodi district of New Jersey, stated in Feb. 2011 that "When you have students dressed alike, you make them safer. If someone were to come into a building, the intruder could easily be recognized." Second, school uniforms keep students focused on their education, not their clothes. A bulletin published by the National Association of Secondary School Principals stated that "When all students are wearing the same outfit, they are less concerned about how they look and how they fit in with their peers; thus, they can concentrate on their schoolwork." A 2010 University of Houston study found that elementary school girls' language test scores increased by about three percentile points after uniforms were introduced. Former US Secretary of State Hillary Clinton, when she was a 2008 US presidential candidate, advocated school uniforms as a way to help students focus on learning: "Take that [clothing choices] off the table and put the focus on school, not on what you're wearing." Chris Hammons, Principal of Woodland Middle School in Coeur d'Alene, ID, stated that uniforms "provide for less distraction, less drama, and more of a focus on learning." Third, wearing uniforms enhances school pride, unity, and community spirit. A 2007 study from Oxford Brookes University in the United Kingdom found that uniforms "often directly contributed to a feeling of school pride." Christopher P. Clouet, Superintendent of the New London, CT school district, stated that "the wearing of uniforms contributes to school pride." A 2002

study of over 1,000 Texas middle school students found that students in uniform "reported significantly more positive perceptions of belonging in their school community than reported by students in the standard dress group." Arnold Goldstein, PhD, head of the Center for Research on Aggression at Syracuse University, stated that uniforms help troubled students feel they have the support of a community: "There is a sense of belonging." A 2007 peer-reviewed study found that after uniforms were introduced, "Teachers perceived an increase in the level of respect, caring, and trust... throughout the school" and said "students are made to feel 'important' and as if they are a part of a team by wearing a uniform."

Opponents say school uniforms infringe upon students' right to express their individuality, have no positive effect on behavior and academic achievement, and emphasize the socioeconomic disparities they are intended to disguise. The opponents support their claim on three grounds: first, school uniforms restrict students' freedom of expression. The First Amendment of the US Constitution guarantees that all individuals have the right to express themselves freely. The US Supreme Court stated in Tinker v. Des Moines Independent Community School District (7-2, 1969) that "it can hardly be argued that either students or teachers shed their constitutional rights to freedom of speech or expression at the schoolhouse gate." In the 1970 case Richards v. Thurston (3-0), which revolved around a boy refusing to have his hair cut shorter, the US First Circuit Court of Appeals ruled that "compelled conformity to conventional standards of appearance" does not "seem a justifiable part of the educational process." Clothing choices are "a crucial form of self-expression," according to the American Civil Liberties Union of Nevada, which also stated that "allowing students to choose their clothing is an empowering message from the schools that a student is a maturing person who is entitled to the most basic self-determination." Clothing is also a popular means of expressing support for various social causes and compulsory uniforms largely remove that option. In Oct. 2013, students at Friendly High School in Prince George's County, MD, were not allowed to wear pink shirts to support Breast Cancer Awareness Month. As a result, 75 students received in-school suspensions for breaking the school's uniform restrictions. Second, school uniforms promote conformity over individuality. At a time when schools are encouraging an appreciation of diversity, enforcing standardized dress sends a contradictory message. Chicago

junior high school student Kyler Sumter wrote in the Huffington Post: "They decide to teach us about people like Rosa Parks, Susan B. Anthony and Booker T. Washington... We learn about how these people expressed themselves and conquered and we can't even express ourselves in the hallways." Troy Shuman, a senior in Harford County, MD, said the introduction of a mandatory uniform policy to his school would be "teaching conformity and squelching individual thought. Just think of prisons and gangs. The ultimate socializer to crush rebellion is conformity in appearance. If a school system starts at clothes, where does it end?" In schools where uniforms are specifically gendered (girls must wear skirts and boys must wear pants), transgendered, gender-fluid, and gender-nonconforming students can feel ostracized. Seamus, a 16-year-old transgendered boy, stated, "sitting in a blouse and skirt all day made me feel insanely anxious. I wasn't taken seriously. This is atrocious and damaging to a young person's mental health; that uniform nearly destroyed me." Late satirist George Carlin asked, "Don't these schools do enough damage, making all these children think alike? Now they're gonna get them to look alike, too?" And third, school uniforms do not improve attendance, academic preparedness, or exam results. David L. Brunsma, PhD, Professor of Sociology at Virginia Polytechnic Institute and State University (Virginia Tech), co-authored a study that analyzed a national sample of 10th graders and found "no effects of uniforms on absenteeism, behavioral problems (fights, suspensions, etc.), or substance use on campus" and "no effects" on "pro-school attitudes, academic preparedness, and peer attitudes toward school." Brunsma also found a "negative effect of uniforms on academic achievement," and later found that uniforms were equally ineffective on elementary students and eighth graders. A 2009 peer-reviewed study found "no significant effects of school uniforms on performance on second grade reading and mathematics examinations, as well as on 10th-grade reading, mathematics, science, and history examinations... [I]n many of the specifications, the results are actually negative.

This article is an excerpt from an internet source. The full information is available online via http://school-uniforms.procon.org/

Questions: Please answer the following questions.

Task 1: *Impromptu speech*. Please answer the following general questions. You will not have time to prepare your answer.

1. Is it mandatory that you wear uniform to your school?

2. What kind of cloth would you wear if school uniform is not mandatory?

3. Do you think there is any benefit to wearing school uniform?

As you might have guessed, we are going to talk on the topic of school uniform today.

Task 2-4 : Read the given passage and answer questions

Task 2: *Identify the strength and weakness*: Which one do you think is the strongest and and weakest argument of both sides.

Task 3: *Focal and Peripheral point identification.* Please identify the main clash points and supporting details of the opponent to school uniform.

Task 4: *Roleplaying*. Imagine yourself as a Prime Minister of Thailand. You are about to give a speech to the audience in the parliament on the policy to ban school uniform. Please give a speech using a proper level of word appropriate to this situation

Appendix B: Sample Watson Glaser Critical Thinking Appraisal

<div style="background-color:orange">

Watson Glaser Critical Thinking Appraisal Test Questions Booklet

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The Watson Glaser Critical Thinking Appraisal Test will assess your ability to make inferences and assumptions and to reason logically with arguments. The test comprises the following **five** sections:

1. Inferences
2. Assumptions
3. Deductions
4. Interpreting Information
5. Arguments

Read the instructions preceding each section and answer the questions. There are a total of **85 questions** in this test and you should aim to correctly answer as many questions as you can within **40 minutes.**

The test will begin on the next page.

Section 1: Inferences

Although it is agreed that China is rapidly modernizing its army, there is some doubt surrounding the exact amount it is spending. The research institute 'PIPPI', submits that the annual Chinese defense spending has risen from almost $31 billion in 2000 to over $120 billion in 2010. This figure is almost double the official figure published by the Chinese government, who fail to include other areas such as research and development in the official figure each year. In 2010, the United States government spent around $400 billion on military defense. Based on the current level of military growth, statistics suggest that China's defense spending could overtake America's by 2030. In addition to military spending, China's army continues to enjoy the largest number of people within the ranks of its army than any other country.

Inference 1: The official figures published by the Chinese government in relation to their military spending are thought to be misleading.

True
Probably True
More Information Required
Probably False
False

Inference 2: It is known that the Chinese government leave areas such as 'research' and 'development' from their official figures, however, this would also suggest that other areas of spending are also omitted from the official figure.

True
Probably True
More Information Required
Probably False
False

Section 2: Assumptions

Monarchic nations, i.e. the   ublican nations in several ways. An example of this difference is that citizens of monarchic nations pay more tax than citizens of republican nations.

Assumption 1: The governments of monarchic nations are responsible for setting tax rates on their citizens.

Assumption Made
Assumption Not Made

Assumption 2: Republican nations do not have a royal family.

Assumption Made
Assumption Not Made

Assumption 3: The only types of nation are monarchic and republican.
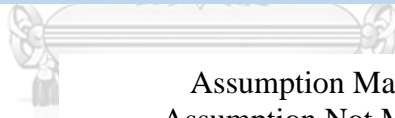
Assumption Made
Assumption Not Made

Section 3: Deductions

> In an attempt to cut expenses, an organisation disbanded its IT department and outsourced its IT function to a business process outsourcing company. In doing so the company has managed to save 20% on its IT function expenditure.

Conclusion One: Outsourcing functions to business process outsourcing companies will cut expenses

Conclusion Follows
Conclusion Does Not Follow

Conclusion Two: The aim of this company's outsourcing was to make the organisation more profitable.

Conclusion Follows
Conclusion Does Not Follow

Conclusion Three: The outsourced IT function has saved the organisation 1/5th on their IT function expenditure compared to the in-house IT function.

Conclusion Follows
Conclusion Does Not Follow

Section 4: Interpreting Information

The Tapoloa Club is a Hawaiian-themed night club in central London. Its most popular drink is the Volcano, which emits sparks and flames. The Tapoloa Club also offers a range of cocktails in perverse containers such as pineapples and coconuts, such as the 'Coconut Express' and the 'Pineapple Pick-Up' respectively. Therefore:

Conclusion One: The 'Coconut Express' is the second most popular drink sold by the Tapoloa Club.

Conclusion Follows
Conclusion Does Not Follow

Conclusion Two: All themed clubs in London sell unusual drinks.

Conclusion Follows
Conclusion Does Not Follow

Conclusion Three: The "Coconut Express" is contained in a pineapple, and the "Pineapple Pick-Up" is contained in a coconut.

Conclusion Follows
Conclusion Does Not Follow

Section 5: Analyzing Arguments

Should companies downsize their workforces to decrease expenses and maximise

Argument One: Yes, downsizing will protect the company from bankruptcy in hard economic times.

Strong Argument
Weak Argument

Argument Two: Yes, companies have no obligation to employ more people than it can handle.

Strong Argument
Weak Argument

Argument Three: No, downsizing leads to demoralisation of the workforce and causes a drop in employee productivity

Strong Argument
Weak Argument

Appendix C: DIFLE Rubric

DIFLE Rubric

The Debate Instruction through Flipped Learning Environment is designed to evaluate students research skills, critical thinking skills, and speaking ability to measure effects of DIFLE course.

	5	4	3	2	1
Predebate Research Skills					
1.1)Understanding and Additional Research	Student understands the issue at a profound level and did additional research.	Student under the issue at a moderate level and did few additional research.	Student understands the basic information of the issue but did not do any additional research.	Student has misunderstanding of issues and did not do any additional research.	Students has complete misunderstanding of the issues and did not do any additional research.
Critical Thinking					
2.1)Case Construction	The problems and motion were clearly, thoroughly, and fairly defined and are consistent with proposed solution/counter-model.	The problems and motion were sufficiently and fairly defined and are consistent with proposed solution/counter-model.	The problems and motion were minimally and fairly defined, and are consistent with proposed solution/counter-model.	The problems and motion were vaguely and defined, and is slightly consistent with proposed solution/counter-model.	The problems and solution/counter-model were not, or unfairly, defined and are not consistent with solution/counter-model.
2.2)Argument Construction	All arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.	Most arguments were clearly tied to an idea (premise) and organized in a tight, logical fashion.	All arguments were clearly tied to an idea (premise) but the organized was sometimes not clear or logical.	Arguments were not tied well in an idea.	Arguments were not tied to an idea at all.
2.3)Refutation	All counter-arguments were accurate, relevant and strong.	Most counter-arguments were accurate, relevant and strong.	Most counter-arguments were accurate, relevant, but several were weak.	Some counter arguments were weak and irrelevant.	Counter-arguments were not accurate and/or relevant.
2.4)Use of Information	All information	Most information	Most information	Some information	Information has some

	5	4	3	2	1
	presented in this debate was clear, accurate and relevant.	presented in this debate was clear, accurate and relevant.	presented in this debate was clear and accurate, but not usually relevant.	presented was accurate, but there were some minor inaccuracies.	major inaccuracies OR was usually not clear.
Speaking Ability					
3.1)Speaking Fluency	Speaks smoothly, and communicates without hesitation; Pronunciation and intonation are always very clear/accurate.	Speaks smoothly, with little hesitation that does not interfere with communication; Pronunciation and intonation are almost always very clear/accurate.	Speaks with some hesitation, but it does not usually interfere with communication; Pronunciation and intonation are usually clear/accurate with a few problem areas.	Speaks with some hesitation, which often interferes with communication; Pronunciation and intonation errors sometimes make it difficult to understand the student	Hesitates too often when speaking, which often interferes with communication; Frequent problems with pronunciation and intonation
3.2)Speaking Strategies	Employment of speaking strategies such as signposts, connectors and paraphrasing were pervasive; Student was able to clearly emphasize ideas and their relations.	Employment of speaking strategies such as signposts, connectors and paraphrasing were frequently; Student was able to emphasize ideas and their relations.	Employment of speaking strategies such as signposts, connectors and paraphrasing were occasional; Ideas and their relations were sometimes clearly presented	Employment of speaking strategies such as signposts, connectors and paraphrasing were scare; Ideas and their relations were unclearly presented	Employment of speaking strategies such as signposts, connectors and paraphrasing were non-existent; Ideas and their relations could not be distinguished.

Appendix D: Lesson Plan

<u>**Lesson Plans**</u>

The following instructional manual is designed for Making Arguments session, Constructing Case I session, and Working with Team session, making up a full cycle of the first unit. As the first session is devoted to the general understanding, introduction to the idea of debate class and pretest, the session mentioned here might be used as, respectively, the second, third and fourth session of DIFLE.

The theme of the first unit is "social justice" which is paired up with the skill set to be taught to students in each session as described in the Course Overview Document. Since there is no debate for the first two sessions, the theme is integrated into the activities that will be worked out in classroom setting which will consist of active learning activities to prime students with the skills necessary for the debate delivery on the fourth session. The motion on which students will be debating on the fourth session is "This House Would abolish death penalty." under the aforementioned theme.

Students will learn debate skills through lecture and introductory videos on Youtube given prior to the learning session. For the lesson in Making Arguments, students will learn about the structure of argumentations and how to create them. The lesson in Constructing Case I teaches students the importance of giving definition in debate setting. Lastly, the lesson in Working with Team concerns the creation of synergy between teammates through learning different speakers' role, thus preparing students for debate at the end of the first unit cycle.

Justification for Choice of Videos:

The video was chosen because of its simplicity and comprehensibility. The instructor in the lecture video is Logan, an Indonesian debate instructor renowned for his skill as an instructor for beginners in debate circuits. His videos have multiple parts which clearly lay down the basics of debating. Furthermore, the debate instruction given in the video also integrated issues that is compatible to the debate theme and motions used in the class. The introductory videos for the background knowledge on death penalty could also be found on YouTube among myriad of other videos on the

subject. The variety of videos allows the researcher to guide students for further exploration of the subject on their own. Therefore, the researcher believes that the videos provided herewith as a class material are appropriate for DIFLE.

1.1 Making Arguments

Learning Outcomes:

1) Students will be able to deliver speech pertaining to social justice theme

2) Students will able to produce reasoned arguments,

3) Students will be able to identify premises (reasons), counterarguments, and conclusions;

4) Students will be able to use signposts and connectors to structure their arguments.

Links to Videos:

1) Argumentation part1 introduction:

https://youtu.be/30m1KCzL2Zg

2) Argumentation part2 logic: https://youtu.be/isytw-0AjuA

3) Argumentation part3 structure: https://youtu.be/Q1uWok1nxjU

Out-of-class Activity

1) Lecture Video and Independent Research

Activity 1: Introductory and Lecture Video and Independent research
Procedure: Instruction the URL of lecture video clips chosen for DIFLE participants. The videos relevant to the lesson on *"Making Arguments: Structure, claims and supports"* is uploaded on Youtube. The students then use the given URL to access the videos and learn about debate instruction and social issues. Instruction to further independent research and guiding questions will be given along with the video to act as guideline for further self-learning.

Procedure of In-class Activity (2 hours):

Activity 2: Identify claim and premises for each of these arguments (45 minutes)

Materials: worksheet 1.1 and 1.2

Procedure:

Teacher gives handouts to students in the class and let students familiarize with the class material. After talking about the videos that students watched online, teacher briefly reminds students of the structure of argumentation, especially the differences between claims and premises. Let students work on the given worksheet by having them identify the claims and premises of each argument presented. After all the students are done with the task, teacher provides answers to all the questions and explains any remaining incomprehension.

Activity 3: Argument Stations (45 minutes)

Materials 1.3: Handouts with definitions and examples for different parts of argument (attached below).

Procedure:

Students are divided into six groups, each representing different parts of argument, including Claims, Reasons, Evidence, Warrants, Acknowledgement and Response and Qualifications. Each group is assigned to be responsible for producing a part of argument construction. Then the group that is responsible for making the claim might begin contributing new claims related to social justice issue to the class, followed by other groups trying to contribute their part in order to create a whole argument. The groups then switch roles to get the chance to contribute parts of argument to a new role. Teacher might take notes on the new claims or help give new arguments to the group. The class discussion could be prompted by any part of the argument. After the class is over, students are given work to evaluate each argument presented in the class whether they are valid or not.

Activity 4: Flow of Claims: Uses of Strategic Language (30 minutes)

Materials: cardboard of different connectors

Procedure:

Students are divided into groups of four. Each group is given a pot which contains random speech connector words and phrase linkers. Students fish into the pot for a cardboard and are given time to study what the meaning of connector they have drawn. The activity then starts by a primary claim by the instructor - which

could be the claims made by students in the previous activity – followed by students making further claims using only the connectors they are given. Therefore, Students' responses to the given primary claims and claims previously made by friends must be in accordance with the meaning of the connectors.

In order to expose students to various meaning of connectrs, such as ones used to contrast, contradict, or to show causal relationships, the activity could be played for several rounds. One round can go on for several turns before students put away the cardboard and start fishing for a new speech connector word.

1.2 Case Construction I

Learning Outcomes:

1) Students will be able to deliver speech pertaining to social justice theme.

2) Students will able to identify keywords of different motions.

3) Students will be able to define terms to construct debate cases.

4) Students will be able to use language level appropriate to debating.

Links to Videos:

1) Definition 1 part1: https://youtu.be/Y1d3ezFXRXw

2) Definition 1 part2: https://youtu.be/S36mlMEjJFI

3) Definition 2 part1: https://youtu.be/td4f8EHzry4

4) Definition 2 part2: https://youtu.be/ONzWkkc59LQ

Out-of-class Activity

1) Lecture Video and Independent Research

Activity 1: Introductory and Lecture Video and Independent research
Procedure: Instruction the URL of lecture video clips chosen for DIFLE participants. The videos relevant to the lesson on *"Constructing Case I: Definition and Characterization"* is uploaded on Youtube. The students then use the given URL to access the videos and learn about debate instruction and social issues. Instruction to further independent research and guiding questions will be given along with the video to act as guideline for further self-learning.

Procedure of In-class Activity (2 hours):

Activity 2: Keywords Identification (30 minutes)
Materials: Prepared list of motion for students from Material 2.1 **Procedure:** Teacher reminds students of the lecture video and reviews how the definition of motions works. Teacher shows students the motions related to social justice and let students point out keywords that would require a definition in the debate. The criteria for which term requires a definition depends on whether the term will become

problematic or contestable during the debate. Therefore, apart from identifying keywords, teacher might ask students to share with the class and ask why the student thinks such keywords should be debatable. Teacher points out any mistakes as the students take turn to share their answers to the whole class.

Activity 3: Defining the Motion (45 minutes)

Materials: Prepared list of motion for students from Material 2.1

Procedure:

Building on the same motions, students are given time to choose the motions they want to use and are assigned the task to construct their case based on the motion give. Students must be able to give definitions for the motions in the position of a Prime Minister in debate speaker's roles, that is to give a full definition in order to support the position advocating the motion. Students then take turns to present their version of definition to the class while other listen as give comments. Teacher might suggest any debatable points that are raised by students for discussion with the class.

Activity 4: Flow of claims: Debate Vocabulary (45 minutes)

Material: List of debate vocabulary from material 2.2

Procedure:

Students are divided into groups of four. Each group is given a pot which contains random debate vocabulary. Students fish into the pot for a cardboard and are given time to study what the meaning of vocabulary they have drawn and in what context should this vocabulary be used in a debate scenario. The activity then starts by a primary claim by the instructor. Students in the group, then make further claims using only the given vocabulary. Students' responses to the given primary claims and claims previously made by friends must be in accordance with the proper use of the word in debate context.

The activity could be played for several rounds to allow for variety in vocabulary learned. One round can go on for several turns before students put away the cardboard and start fishing for a new vocabulary. The activity end by the instructor clarifying all the vocabulary for correct understanding of word usage.

1.3 Working with Team

Learning Outcomes:

1) Students will be able to deliver speech on death penalty issue;

2) Students will able to produce reasoned arguments,

3) Students will be able to identify premises (reasons), counterarguments, and conclusions;

4) Students will be able to debate according to their assigned role as a team.

5) Students will be able to do independent research on death penalty

Materials: 1) DIFLE Rubric

Link to Videos:

1) Introductory video on death penalty:

https://www.youtube.com/watch?v=PJEsObvSjww

2) AP Style Speakers' Role:

http://www.youtube.com/playlist?list=PLOuHG02ulGCgJQXCWa6Lg8F7jg9Q8aEmd

Out-of-class Activity: Predebate Phase

1) Introductory and Lecture Video

Activity 1: Introductory and Lecture Video and Independent Research
Procedure: Instruction the URL of introductory and lecture video clips chosen for DIFLE participants. The videos relevant to the lesson on "Working with Team: Speakers' Role" and the debating motion "This House Would abolish death penalty" are uploaded on Youtube. The students then use the given URL to access the videos and learn about debate instruction and social issues. Instruction to further independent research and guiding questions will be given along with the video to act as guideline for students' further self-learning. Another URL for the predebate questions will also be given for students to access and complete the task before entering in-class session. This allows the instructor to evaluate the level of understanding on the topic and to analyze for common mistakes. The link to online questionnaire can be accessed online via: http://goo.gl/forms/PGteAvtkyoEzzYYc2.

In-class Activity: Debate Session

Activity 2: Debate Delivery (1.5 hour)

Materials: DIFLE Rubric for instructor's evaluation

Classroom setting:
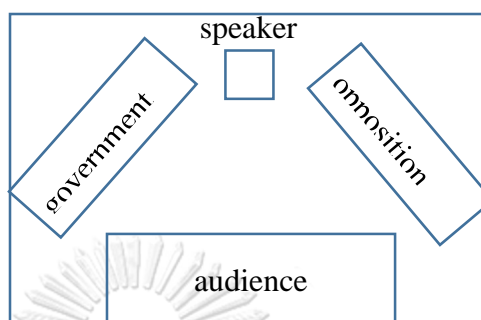
Procedure:

Instructor assigns six students as debaters and randomly divides them into two teams of three students. Each team is assigned to be on a bench between government and opposition bench. The teacher reminds students of the speakers' role before letting debaters leave the classroom for 30 minutes for debate preparation while the rest of the class discuss on the debate topic and share their ideas on the independent research.

After preparation time is over, all debaters return to the classroom and begins the debate. The debate proceeds by starting with the Prime Minister's opening speech. The speaking order then alternates back and forth between government and opposition bench according the sequence given below.

- Order of Speakers

Government Bench	Opposition Bench
1st Speaker: Prime Minister	1st Speaker: Leader of Opposition
2nd Speaker: Deputy Prime Minister	2nd Speaker: Deputy Leader of Opposition
3rd Speaker: Government Whip	3rd Speaker: Opposition Whip

Each speech lasts 7 minutes and all students participating as audience are allowed to ask questions through Points of Information or POIs by raising their hand.

The current speaker are could choose whether accept the question but are encourage to do so in order to create a more interactive and engaging debate.

The Instructors give scores using DIFLE Rubric while audience take notes.

Activity 3: Postdebate Discussion and Evaluation (30 minutes)

Materials: none

Procedure:

The instructor randomly announces names of three students who are assigned the role of debriefers. Debriefers are assigned role to give their critical review of the debate that has just ended, including clash points and strong arguments of each side. The preparation time for debriefer is 5 minutes while the speaking time is 7 minutes for each student.

After the debriefers have given their opinions on the debate, the instructors lead the postdebate discussion for the whole class. The topics could vary from one debate or another depending on the subject and flow of the debate. The questions might, for instance, address the reasons students use to reach certain conclusions or they might be related to the session's lesson on teamwork, such as whether the speakers have fulfilled their speaker's role. Questions might also invite students to further question the assumptions made in the debate by expanding the scope of and contextualizing the debate.

The class is then asked to vote on their opinion and give reasons for their decision on the winning bench. Here the instructor must pay very close attention to the reason given by students in reach the winning team decision as well as give comments to the logic of their decisions. Lastly the teacher gives his own opinion as to who has won the debate and explain the reason the instructor find to be decisive factor for the decision. This feedback on both critical thinking and speaking ability is crucial in helping students to understand the mistakes and improve their performance.

Appendix E: Exercises for Lesson Plan

1.1 Class Material for Making Arguments
　　Material 1.1:

Instruction: Identify claim and premises for each of these arguments

1.1) All dog has four legs Shiro is a dog Therefore, Shiro has four legs.	Claim: _____ Premise 1: _____ Premise 2: _____
1.2) Brandon is a good kid All good kids help their parents with work Brandon helps his dad do laundry	Claim: _____ Premise 1: _____ Premise 2: _____
1.3) All governments corrupt Every government I know corrupts The list of governments I know is comprehensive	Claim: _____ Premise 1: _____ Premise 2: _____
1.4) If you sleep on a sofa, you will get back pain I get back pain I sleep on the sofa last night	Claim: _____ Premise 1: _____ Premise 2: _____
1.5) Stricter law leads to less crime There law is stricter	Claim: _____

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Therefore, there will be less crime	Premise 1: _____ Premise 2: _____
1.6) Legalization of death penalty leads to less crime Death penalty is legalized There is lower number of crime after the legalization of death penalty.	Claim: _____ Premise 1: _____ Premise 2: _____

<u>Class Material for Making Arguments</u>

Material 1.2:

Instruction: Read these quotations and identify and/or paraphrase the authors' main ideas and supports.

2.1) "It is only the oppressed who, by freeing themselves, can free their oppressors. The latter, as an oppressive class, can free neither others nor themselves. It is therefore essential that the oppressed wage the struggle to resolve the contradiction in which they are caught; and the contradiction will be resolved by the appearance of the new man: neither oppressor nor oppressed, but man in the process of liberation."

Excerpt From: Freire, Paulo; Bergman Ramos, Myra;. "Pedagogy of the Oppressed."

Claim:

_____

Premise 1:

_____

Premise 2:

_____

2.2) "To compromise is human. In the animal kingdom, you don't see a lot of protracted negotiations between predators and their victims. The ability to compromise is a particularly advanced and difficult form of decision making—and therefore one of the first abilities to decline when our willpower is depleted, particularly when we take our depleted selves shopping."

Excerpt From: Roy F. Baumeister. "Willpower."

Claim:

_____

Premise 1:

_____

Premise 2:

_____

2.3) "Researchers and clinicians often argue that psychopaths don't "do" empathy—that because of their lethargic amygdalae they just don't feel things in the same way as the rest of us. Studies have revealed that when psychopaths are shown distressing images of, say, famine victims, the lights located in the emotion corridors of their brains quite simply don't come on: that their brains—if viewed under fMRI conditions—merely pull down the emotional window blinds and implement a neural curfew."

Excerpt From: Kevin Dutton. "The Wisdom of Psychopaths."

Claim:

_____

Premise   1:

_____

Premise   2:

_____

2.4) "The question is, how could someone of such obvious intelligence do something so irrational—so downright dumb? The answer: Academic intelligence has little to do with emotional life. The brightest among us can founder on the shoals of unbridled passions and unruly impulses; people with high IQs can be stunningly poor pilots of their private lives."

Excerpt From: Daniel Goleman. "Emotional Intelligence."

Claim:

_____

Premise1:

_____

Premise2:

_____

Class Material for Making Arguments

Material 1.3: Argument Stations

The following table shows the definitions and examples of six different parts of argument.

	Claim	**Reasons**	**Evidence**
Definition	A statement that is: * Not otherwise known. * Contestable. * Supportable with evidence.	Statements that: * Explain why you think your claim should be accepted by you and by your readers. * Represent judgments that you assume are not shared by your readers.	Statements that: * Describe or otherwise represent facts about the world that are assumed to be shared with readers. ("You could look it up.") * Will not be questioned by readers, at least not for the moment. * Note: evidence is comprised of representations of states of affairs that are treated, for the sake of the argument at hand, as external, foundational facts.
Examples	1) The Winter Olympics should be held every two years. 2) We should build a memorial for World War II veterans. 3) Hamlet was devoid of Christian values.	The Winter Olympics should be held every two years . . . Reasons: 1) so aging athletes have more chances to compete. 2) to bring more money into the economies of host cities.	The Winter Olympics should be held every two years so aging athletes have more chances to compete. Evidence: A study conducted in 1999 by the Organization of

			Olympic Athletes (OOA) shows that many athletes peak during non-Olympic years and, as a result of aging, can no longer compete when the games re-open.

	Warrants	**Qualifications**	**Acknowledgements and Response**
Definition	General principles that: 　　* Assert a principled connection between a kind of reason/ evidence and a kind of claim. * Have two components, a reason/ evidence side and a claim side. * Are normally assumed rather than stated. 　　* Represent shared beliefs and values without which an argument cannot get off the ground.	Words, phrases, and occasionally sentences that: 　　* Specify degrees of certainty, limits on the sufficiency or quality of evidence, etc. * Limit the range of a claim. 　　* State conditions required for a claim to apply (excluding clauses concerning obvious conditions that go without saying). * Show readers your sense of the reliability and range of applicability of your argument.	*Acknowledgments* Statements that: * Raise or refer to alternative claims, reasons, evidence, or warrants. * Locate an argument in a field of possible arguments. * Show readers that you have not ignored their concerns. *Responses* Statements that: * Accept or reject an acknowledged alternative. * Offer arguments or mini-arguments against an alternative. * Explain the complications and limits of your argument.

1.2 Class Material for Case Construction I
   Material 1

   Instruction: Define different terms of each motion.

1. This House Believes that assisted suicide should be legalized
   1.1. Assisted Suicide
   1.2. Be Legalized
2. This House Believes wild animals should not be kept in captivity
   2.1. Wild animal
   2.2. Kept in capitivity
3. This house would ban cosmetic surgery
   3.1. Ban
   3.2. Cosmetic surgery
4. This House Would legalize the sale of human organ
   4.1. Legalize
   4.2. Human organ
5. This House Would legalize abortion
   5.1. Legalize
   5.2. Abortion
6. This House Would legalize prostitution
   6.1. Legalize
   6.2. Prostitution
7. This House Believes criminal justice should focus more on rehabilitation.
   7.1. Criminal justice
   7.2. Focus more
   7.3. Rehabilitation
8. This House Believes that developed countries have a higher obligation to combat climate change than developing countries
   8.1. Developed countries
   8.2. Developing countries
   8.3. Higher obligation
   8.4. Combat climate change
9. This House Would allow prisoners to vote
   9.1. Allow
   9.2. Prisoners
   9.3. Vote
10. This House Believes that housewives should be paid for their work
   10.1. Housewives
   10.2. Be paid for their work
11. This House Would ban gambling
   11.1. Ban
   11.2. Gambling
12. This House Believes that animals have rights.
   12.1. Animals
   12.2. Rights
13. This House Would use torture to obtain information from suspected terrorists.
   13.1. Torture
   13.2. Obtain information
   13.3. Suspected terrorists
14. This House Believes social deprivation causes crime.
   14.1. Social deprivation
   14.2. Cause crime
15. This House Would make all parents attend parenting classes
   15.1. All parents
   15.2. Attend parenting classes

Class Material for Case Construction I

Material 2 (from *Landesakademie fur Fortbildung und Personalentwichklung an Schulen*, Accessible online via: https://lehrerfortbildungbw.de/faecher/englisch/gym/fb1/binnendiff/2_ue_mat/mat14/)
Instruction: Use the following debate vocabulary appropriate to the context.

(1) When you start saying something / contributing to a conversation:
First of all, I would like to say/state that
To begin with, I
In the first line, I

(2) What can you say instead of "I think"
I would say/think
In my opinion
To my mind
I am of the opinion that
I hold the opinion that

(3) When you want to stress your "personal opinion":
Personally I think
As far as I am concerned
As for me
As I take it
As far as I can see

(4) When you "agree" or when you "don't agree":
I entirely/quite agree with you.
I agree to (with) her plan.
I am of the same opinion.
I differ from/with you entirely.
I disagree with you: I am sure you're mistaken.
I stick to my opinion.
Let's agree to differ!

(5) When you want to say the "opposite" of what someone else said:
on the contrary! quite the contrary! just the opposite!
That is the very opposite of what I said.
That is quite the contrary to what I said.
I maintain the contrary.

In contrast to what you said, I maintain that...........

(6) When you are "quite sure" of something:
of course!
That goes without saying
It goes without saying that
I contend/maintain that................
It's my conviction that.................

(7) When you want to "ask a question":
May I interrupt you?
There arises the question/point whether/if
This question raises the whole issue

(8) When you "haven't understood":
I beg your pardon. / Pardon?
Could you repeat what you've just said?
But slower, please./ Could you slow down a bit?

(9) If you should want to "correct a mistake":
Excuse me (for interrupting) you should have said:"....."

(10)When you want to distinguish one aspect from the other:
on the one hand - on the other hand
in general - in particular
generally speaking
on the whole
taken as a whole
at first sight - on second thoughts

(11)When you want to "add" something:
In addition
Moreover
Furthermore
Finally

(12)When you want to "emphasize" something:
I would like to lay (put) emphasis (stress) on the fact that..   ;
I just want to point out that

(13)When you want to "say the truth":
To be frank (with you)
Frankly (speaking)
To say the truth

(14)And if you are "not sure":
I don't know exactly.
I don't know for certain.

(A) General phrases:
in other words
        in this respect
to a certain degree/extent
It depends on your point of view
in brief/short
To be brief
To cut a long story short,......
Let me put it this way:....
I don't know. - I don't know either.
Nor/Neither do I.

Additional Exercise

Add the following expressions to the given categories
I agree with / disagree with you;
I see/understand your point but;
You´ve got a point / a case there but;
I´m not sure. whether …;
I have doubts / reservations about

I don´t see that working in practice.;
It may work in the short-term / in the long-term;
I think that´s debatable;
Prove it!;
Your argument is flawed because...;
What´s that got to do with the issue?;
You´re missing the point;
It´s ridiculous to suggest that.... ;
My feeling is.. ;
If you ask me... ;
As for me.... ;
Bear in mind that … ;
You´d better do ... ;
Let´s face it.... ;
In general... ;
On the whole... ;
As a rule.... ;
It goes without saying that... ;
What´s more / in addition / furthermore ; What I´m getting at is... / What I´m trying to say is.. / My point is... ;
What is your point? What are you driving at? ;
You´re not serious, are you? ;
You must be joking! That´s nonsense / rubbish / ridiculous.

Appendix F: Opinion Survey Questionnaire

Opinion Survey Questionnaire

1. Name_____ Sex: ☐ male ☐ female
2. Age_____ Level of education M._____
3. School name _____ Program: ☐ English
                                                                                ☐ Thai

4. Instruction: Please rate the following statements that resonate with your opinion of the Debate Instruction through Flipped Learning Environment course.

Questions	(1) Strongly Disagree	(2) Disagree	(3) Neutral	(4) Agree	(5) Strongly Agree
Organization of Debate Instruction in Flipped Learning Environment					
1. The flipped learning environment is *more engaging* than traditional classroom instruction					
2. The flipped learning environment gives me greater *opportunities to communicate with other students* in class					
3. The flipped learning environment gives me greater *opportunities to communicate with the teacher*					
4. The flipped learning environment allowed me to *study at my own pace*					
Effects of DIFLE on English Speaking Ability					
5. DIFLE has allowed me to *speak English smoothly and without hesitation*					
6. DIFLE has allowed me to speak English with *correct pronunciation and intonation*					
7. After DIFLE, I know how to use language tools (such as signposts) to *structure my arguments*					
8. After DIFLE, I know how to use language tools to *emphasize ideas and their relationships*					
Effects of DIFLE on Critical Thinking Skills					
9. DIFLE has positive effects on my *critical thinking*					
10. DIFLE has positive effects on my ability to *recognize good arguments from the bad ones*					
11. DIFLE has positive effects on my ability to *refute arguments*					
12. DIFLE has positive effects on my ability to *create an argument*					

Questions	(1) Strongly Disagree	(2) Disagree	(3) Neutral	(4) Agree	(5) Strongly Agree
Predebate phase: Independent research and Teaching content					
13. Online videos were *helpful to my independent research*					
14. Introductory videos were *effective tools to help me understand the topic*					
15. Lecture videos were effective tools to improve my speaking ability					
16. Lecture videos were effective tools to help me learn about *critical thinking*					
17. Lecture videos *were interesting*					
18. Lecture videos were *easy to understand*					
19. Independent research helped me *encounter ideas that is different from my own*					
20. Independent research allowed me to *come up with my own new ideas*					
21. The *difficulty level of* the debate content appropriately corresponds my *language ability*					
22. The quantity of the instructional contents appropriately corresponds to my *interest*					
23. During the instruction, I received *adequate assistance/advice from the teacher*					
Predebate phase: class activity					
24. Instructional *activities* used in class effectively improved my ability to analyze arguments					
25. Instructional *activities* used in class effectively improved my ability to evaluate arguments					
26. Instructional *activities* used in class effectively improved my ability to create my own arguments					
27. Instructional *activities* used in class effectively improved my ability to speak English					
Debate Delivery Phase					
28. Debate has improved my ability to emphasize ideas					
29. Debate has improved my ability to propose solution to a problem					
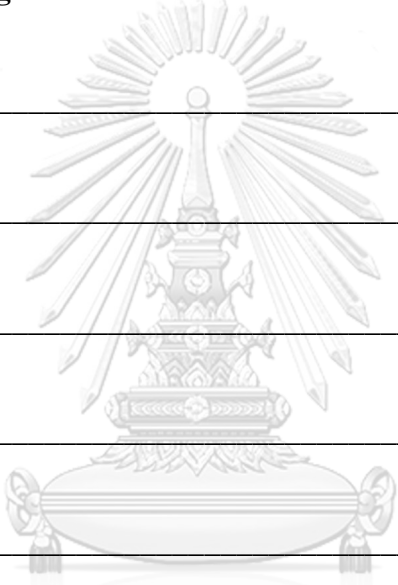
Questions	(1) Strongly Disagree	(2) Disagree	(3) Neutral	(4) Agree	(5) Strongly Agree
Post Debate Phase					
30. Postdebate discussion helps me *understand the subject better*					
31. Postdebate discussion helps me *find solution* to the problem better					
32. *Feedback from friends* in postdebate discussion has positive effects on my English speaking ability					
33. *Feedback from the teacher* in postdebate discussion has positive effects on my English speaking ability					
34. *Feedback from friends* in postdebate discussion has positive effects on my critical thinking					
35. *Feedback from the teacher* in postdebate discussion has positive effects on my critical thinking					

Open-ended Questions

1. What do you like the most about DIFLE course?

_____

_____

_____

_____

_____

_____

2. What do you like the least about DIFLE course?

_____

_____

_____

_____

_____

3. What are your suggestions on the DIFLE course?

_____

_____

_____

_____

_____

4. How do you think debate would help you in the future?

_____

_____

_____

_____

_____

Appendix G: Focus Group Questions

Focus Group Questions

Type of Questions	Sample questions
Engage questions	14. What was the most interesting topic in DIFLE?
	15. What is the difference between you experience in DIFLE and other classes?
DIFLE	16. What do you think about flipped learning environment
	17. What do you think about debate instruction?
	18. Were the videos interesting or could get your attention?
	19. Did you Flipped Learning could replace traditional style teaching? And why?
	20. Do you think online videos provided in DIFLE help improve your critical thinking?
Critical Thinking	21. In what way do you think DIFLE help increase you critical thinking?
	22. In what way do you think DIFLE help you create your own argument?
	23. In what way do you think DIFLE help you refute another person's argument?
English Speaking Ability	24. In what way do you think DIFLE help increase you English speaking ability?
	25. In what way do you think DIFLE help you in English oral communication?
Exit questions	26. Is there anything else you want to share about your experience in DIFLE course?"

Appendix H: IOC Index

1.1 IOC index form for Lesson Plan
      Instruction: Please evaluate the pretest according to the degree of congruence to the teaching outcomes. The scores range from High Degree of Congruence (+1), Unsure (0) and Low Degree of Congruence (-1)

Item	Analysis from experts			IOC scores	Results
	1	2	3		
Scope and sequence (Overall)					
Are the THEMES of the lesson plan interesting, relevant and broad enough for class discussion?	0	1	1	0.67	valid
Are the SEQUENCE of each session's lesson appropriate?	1	1	1	1.00	valid
Is the ORGANIZATION of UNITS into 3 sessions appropriate for one debate cycle?	1	N/A	1	1.00	valid
Is the scope and sequence appropriate for high school students?	0	1	1	0.67	valid
Class Session					
Is the TIME PERIOD appropriate for teaching procedure?	-1	1	1	0.33	invalid
Does the INSTRUCTION MANUAL provide sufficient details of teaching procedure?	0	1	1	0.67	valid
Are the out-of-class ACTIVITIES able to enhance students research ability?	0	0	1	0.33	invalid

Are the out-of-class ACTIVITIES able to enhance students critical thinking and speaking ability?	1	1	0	0.67	valid
Are the VIDEOS related to the session's objective and in-class activities?	1	1	1	1.00	valid
Are the MATERIALS congruent with the session's objectives?	1	1	0	0.67	valid
Are all In-class ACTIVITES appropriate for high school students?	1	1	1	1.00	valid
Debate Session					
Is the DEBATE FORMAT (number of team members, length and order of speech) appropriate for the class?	0	1	1	0.67	valid
Are the NUMBER of DEBATERS for each team appropriate?	0	1	1	0.67	valid
Are the VIDEOS relevant to weekly lessons?	1	1	0	0.67	valid
Are all predebate QUESTIONS able to evaluate student's understanding on the debate motion?	1	0	0	0.33	invalid
Is the predebate INDEPENDENT RESEARCHG able to enhance students critical thinking?	0	1	1	0.67	valid
Is the DEBATE able to enhance students' critical thinking?	1	1	1	1.00	valid
Is the DEBATE able to enhance students' English speaking ability?	0	1	1	0.67	valid
Are the DISCUSSION QUESTIONS able to encourage students to critically engage in discussion?	1	1	0	0.67	valid

Is the FEEDBACKING procedure sufficient for student's skill enhancement?	0	1	1	0.67	valid
Average				0.70	valid

1.2 IOC index form for DIFLE Rubric

Instruction: Please evaluate the DIFLE Rubric according to the degree of congruence to the teaching objectives. The scores range from High Degree of Congruence (+1), Unsure (0) and Low Degree of Congruence (-1)

Section I: Please give your opinion by the degree of congruence between the items and objectives.

Objective	Item	Degree of congruence			Suggestions
		+1	0	-1	
Predebate Research Skill	1.1)Understanding and Additional Research	1	1	1	
Critical Thinking	2.1)Case Construction	2	1		
	2.2)Argument Construction	3			
	2.3)Refutation	3			
	2.4)Use of Information	2	1		
Speaking Ability	3.1)Speaking Fluency	3			
	3.2)Speaking Strategies	3			

Section II: Please give your opinion on the degree of congruence for the task as a whole.

Objective	Degree of Congruence			Suggestions
	(1)	(0)	(-1)	
1. Congruent with course desired outcomes	3			
2. Congruent with student's age and level	3			
3. Congruent with the current issue	2	1		
4. Appropriate content	3			
5. Appropriate language use	2	1		
6. Appropriate to student's interest	2	1		
7. Appropriate form	2	1		

1.3 IOC index form for Pretest and Posttest

Instruction: Please evaluate the pretest according to the degree of congruence to the

Task	Objective	Congruent +1	Question-able 0	Incongruent -1	IOC
1. Impromptu speech	producing **fluent speech at different rates of delivery**	3	-	-	1
2. Identify the strength and weakness	developing and using a battery of speaking strategies, such as **emphasizing key words**, rephrasing, providing a context for interpreting the meaning of words.	1	2	-	0.66
3. Focal and peripheral points identification	conveying links and connections between events and communicate such relations as **focal and peripheral ideas**, events and feelings, new information and given information, generalization and exemplification.	2	1	-	0.66
4. Roleplaying	appropriately accomplishing communicative functions in academic settings, including **proper level of words**	3	-	-	1
Mean Scores		-	-	-	0.83

teaching outcomes. The scores range from High Degree of Congruence (+1), Unsure (0) and

Low Degree of Congruence (-1)

1.4 IOC index form for Opinion Survey Questionnaire
Instruction: Please evaluate the pretest according to the degree of congruence to the teaching objectives. The scores range from High Degree of Congruence (+1), Unsure (0) and Low Degree of Congruence (-1)

Objective	Item	Degree of congruence			Suggestion
		+1	0	-1	
Predebate Phase					
Independent research	1. I always do my independent research prior to debate classroom	3			
	2. Introductory videos are essential to my independent research	2	1		
	3. Independent research was helpful to my debate performance in the classroom	2	1		
Video and Technology	4. I had difficulties using of technology to learn.	3			
	5. Introductory videos are easy to understand.	3			
	6. Introductory videos make learning debate easier.	3			
	7. It is easy to use Google Drive to send my assignments and questionnaire responses.	2	1		
Flipped Learning Environment	8. Flipped learning environment allows me to go at my own pace.	2	1		
	9. I learn better under flipped learning environment than in traditional classroom.	2	1		
	10. I think flipped learning environment is time consuming	3			
Debate Delivery and Postdebate Phase					
Debate	11. I find debate activity to be interesting.	1	1	1	

Objective	Item	Degree of congruence			Suggestion
		+1	0	-1	
	12. I learn better using debate activity than in traditional classroom.	2	1		
	13. I think debate is a stressful learning activity.	1	2		
	14. I believe debate create conflict	1	2		
Critical Thinking Application	15. I am able to recognize arguments in everyday life	3			
	16. I am able to generate opinion easily in everyday life.	2	1		
	17. I use debate to solve problems and make decisions in real-life situations.	2	1		
	18. I voluntarily seek out new issues to discuss with my peers	3			

Open-Ended Questions

Objective	Item	Degree of congruence			Suggestion
		+1	0	-1	
Open-ended Questions					
Feedback on DIFLE course	1. What do you like the most about DIFLE course?	3			
Feedback on DIFLE course	2. What do you like the least about DIFLE course?	3			
Feedback on DIFLE course	3. What are your suggestions on the DIFLE course?	2	1		
Opinion towards debate	4. How do you think debate would help you in the future?	3			

1.5 IOC index form for Focus Group Interview

Objective	Item	Degree of congruence			Suggestion
		+1	0	-1	
Focus Group Questions					
Engage questions	1. What was the most interesting topic in the whole course?	3			
	2. Did you expect the class to be the way it was?	1	1	1	
Exploration questions	3. How do you feel when you get rebutted by the opponent?	2	1		
	4. Did you think there were too much work in the course?	2	1		
	5. Were the videos interesting or could get your attention?	3			
	6. Did you prefer this method or the conventional method of teaching critical thinking and speaking skill?	3			
Exit questions	7. Is there anything else you want to share about your experience in DIFLE course?"	3			

Appendix I: Name of Experts

Chulalongkorn University

Dr. Ruedeerath Chusanachoti
Lecturer
Faculty of Education

Dr. James Haft
Lecturer
Faculty of Communication Arts
Ex-Advisor of Chulalongkorn Debate Club

Assumption University
Dr. Watana Vinitwatanakhun
Assistant Professor
Faculty of Education

Dr. Yan Ye
Lecturer
Faculty of Education

Dr. Richard Lynch
Assistant Professor
Faculty of Education

Thammasat University

Dr. Sameoekan Sophonhiranrak
Lecturer
Faculty of Learning Sciences and Education

Dr. Suthiporn Sajjapanroj
Lecturer
Faculty of Learning Sciences and Education

Ms. Pongkwan Sawasdipakdi
Lecturer
Advisor of Thammasat Debate Club
Faculty of Political Science

Appendix J: Samples of Debate Script

<u>Student A</u>

Okay, (umm) I think the strongest argument of proponent of animal testing is (uhh) animal testing can save a lot of people because we know how to cure animal to make (umm) the vaccine because it tested on animal and they don't have to test on human. And nowadays, there are a lot of diseases and the weakest is the third argument which said that (umm) (uhh) chimpanzee might have the same genetic like humanity and they have an accurate on (uhh) (pause) so they are genetically similar with human when we test.. when we have animal testing.. (umm)(pause)Yes. So I don't think that it's right we can say that.. I know chimpanzee is the same as human so why don't they just test on human instead of animal because.. (uhh) Okay. And the opponent I think the strongest argument is testing on animal is very cruel and inhuman because we use a lot of.. it is like we torture animal when we test them. And I think it is unacceptable to test on animal. It's the same as we test on human because.. (uhh) (umm) (pause) (ohh) I'm so Thank you.

So the main clash point I think the.. (uhh) the proponent of the animal testing said that (uhh) there is no adequate alternative to testing on living but the opponent said that didn't really.. like technology (uhh) to test without killing the animal. Nowadays we have a lot of progress (uhh) technology so we can use them instead of testing on.. on animal. So we.. we don't have to kill them, and we don't have to have experiment on animal, and we can use like.. for instance computer models such as virtual reconstructions of human like they can predict the tox.. tox toxicity of substances without invasive experiments on animal and another one is (uhh) the problem of animal. They said that chimpanzee share 99 percent same genetic as us so when we test them and the result work with human but (uhh) what about the 1 percent that maybe it work on chimpanzee but didn't work on.. doesn't work on human. So (uhh) the opponent said that it is different; not every animal is the same as human. So we can't genetic.. (umm) presume that we can res on animal and it will work on human also. Thank you.

Student B

    Okay (inhale) (ah) so first I'm going to talk about the strongest and weakest part of having animal test. The so the strongest point it is of that I just read, (um) the most the strongest point is that it saves lives of (um) many people it creates and then actively impact the way that we live (um). As for the weakest one I believe that it is the fourth reason is that animals actually benefit from the result of animals testing. I feel like this reason is just a (pause) it's what (ah) how to say (ah) (pause) (ah) a additional like a benefit it's not actually a good reason enough wha when we think about it (ah). In fact, animals that are in these experiments cannot be (small pause) cannot be said as support reason. Here it said that animal can actually benefit but here animals are being tortured. Okay so back to the part about experiment on animal that is wrong. The strongest point I believe is the (um) the torture the torture of animals it is (ah) (pause) if we see the animals I think that we can definitely begin to realize how bad this animal testing is. Like as you can see in this thing actually happen to them and you know it would definitely be a lot worse and in this case we do believe that (um) we believe that animals actually suffer and they actually (um) receive pain. (um) The bad one is the least (ah) the weakest point of this is that drugs that pass animal tests are not necessarily safe. In this thing the example they gave us is from the 1950s which (um) it considered for now this reason might not be applicable (pause) cannot be apply toward the cases nowadays.

    So there are two main clash points in this debate. So one side believe that there is no alternative to animal testing while our side believes that there is an alternative to animal testing. And the second clash point is that (um) humans are (um) similar to animals while our side thinks that they're really different from animals. So talking about the first clash point, our side believes that (um) we can our our alternative of animal testing is having (um) having human cells to test on themselves because in here we're actually testing on human (pause) human. For the second (ah) clash point our side think that (um) animals and humans are really different because in terms of metabolism the way that we are structured. Which in the that (um) end may cause more harm than good that I think that on animals that we cannot treat themselves

Appendix K: Formative Assessment Results

1.1 Debate results on Overall Speaking

Descriptive statistics showed a comparison between the first and the third debate scores on overall speaking. There is a difference in the scores of the first debate (Mean = 2.71, SD = 1.37, Min = 1, Max = 5) and third debate (Mean = 0.91, SD = 0.91, Min = 2, Max = 5).

Table 64: Descriptive statistics of the first debate and third debate on English speaking ability regarding speech flow

	Mean	**SD**	**Minimum**	**Maximum**
First Debate	2.71	1.37	1	5
Third Debate	3.71	0.91	2	5

N = 24

Table 65: The Wilcoxon Signed-Ranks Test on the first debate and third debate scores of English speaking ability regarding speech flow

	N	**Mean Rank**	**Sum of Ranks**
Negative Ranks	5	5.9	29.5
Positive Ranks	14	11.46	160.5
Ties	5		
Total	24		

Z = -2.671; Sig (2-tailed) = .008

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference on students' overall speaking ability. Table 72 showed that of all 24 students participated in the first debate and the third debate, 14 of students gained higher scores in the third debate, 5 students gain the same scores, and 5 students gained lower scores.

The test indicated that the third debate scores was statistically significantly higher than first debate scores of speaking fluency regarding the speech flow with Z value of -2.671 and at the significance level of 0.008. Therefore, there is sufficient

evidence to accept the hypothesis which states that there is a difference between the first debate and third debate scores.

1.2 Results of Critical Thinking

1.2.1 Debate results on overall critical thinking

Descriptive statistics showed a comparison between the first and the third debate scores. There is a difference in the scores of the first debate (Mean = 9.29, SD = 3.46, Min = 4, Max = 18) and the third debate (Mean=14.42, SD=1.95, Min = 9, Max = 17).

Table 66: Descriptive statistics of critical thinking in first and third debate

	Mean	SD	Minimum	Maximum
First debate	9.29	3.46	4	18
Third debate	14.42	1.95	9	17

N = 24

Table 67: The Wilcoxon Signed-Ranks Test on the first debate and third debate score of critical thinking

	N	Mean Rank	Sum of Ranks
Negative Ranks	2	3.5	7
Positive Ranks	22	13.32	293
Ties	0		
Total	2		

Z = -4.094; Sig (2-tailed) = .000

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference. Table 74 showed that of all 24 students participated in the first debate and the third debate, 22 of students gained higher scores in the third debate, 2 students gain the same scores, and 2 of the students gained lower scores in the third debate compared to first debate.

The test indicated that the third debate scores was statistically significantly higher than first debate scores on overall critical thinking with Z value of – 4.094 and

at the significance level of 0.000. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a difference between the first debate and third debate scores.

1.2.3 Debate results on speaking strategies: use of signposts

Descriptive statistics showed a comparison between the first and the third debate scores on speaking strategies scores regarding the use of signposts. The descriptive statistics shows that there is a difference in the scores of the first debate (Mean = 3.04, SD = 1.83, Min = 1, Max = 5) and the third debate (Mean = 4.00, SD = 1.10, Min = 2, Max = 5).

Table 68: Descriptive statistics of the first debate and third debate on English speaking ability regarding use of signposts

	Mean	SD	Minimum	Maximum
First Debate	3.04	1.83	1	5
Third Debate	4	1.1	2	5

N = 24

Table 69: The Wilcoxon Signed-Ranks Test on the first debate and third debate scores of English speaking ability regarding use of signposts

	N	Mean Rank	Sum of Ranks
Negative Ranks	5	7.1	35.5
Positive Ranks	14	11.04	154.5
Ties	5		
Total	24		

Z = -2.425; Sig (2-tailed) = .015

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference on students' speaking fluency regarding use of signposts. Table 76 showed that of all 24 students participated in DIFLE first and third debate, 14 of students gained higher scores in the third debate, 5 students gain the same scores, and 5 student gained lower scores in the third debate compared to first debate.

The test indicated that the third debate scores was statistically significantly higher than first debate scores of English speaking ability with Z value of -2.425 and at the significance level of 0.015. Therefore, there is sufficient evidence to accept the

hypothesis which states that there is a difference between the first debate and third debate scores.

1.2.4 Debate results on speaking strategies: emphasis of ideas

Descriptive statistics showed a comparison between the first and the third debate scores on speaking strategies scores regarding the emphasis of ideas. The descriptive statistics shows that there is a difference in the scores of the first debate (Mean = 2.75, SD = 0.99, Min = 1, Max = 4) and the third debate (Mean = 3.71, SD = 0.75, Min = 2, Max = 5).

Table 70**:** Descriptive statistics of the first debate and third debate on English speaking ability regarding emphasis of ideas

	Mean	**SD**	**Minimum**	**Maximum**
First Debate	2.75	0.99	1	4
Third Debate	3.71	0.75	2	5

N = 24

Table 71: The Wilcoxon Signed-Ranks Test on the first debate and third debate scores of English speaking ability regarding emphasis of ideas

|	**N**	**Mean Rank**	**Sum of Ranks**
Negative Ranks	1	4	4
Positive Ranks	13	7.77	101
Ties	10		
Total	24		

Z = -3.099; Sig (2-tailed) =.002

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference on students' speaking fluency regarding the emphasis of ideas. Table 78 showed that of all 24 students participated in DIFLE first and third debate, 13 of

students gained higher scores in the third debate, 10 students gain the same scores, and 1 student gained lower scores in the third debate compared to first debate.

The test indicated that the third debate scores was statistically significantly higher than first debate scores of English speaking ability with Z value of -3.099 and at the significance level of 0.002. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a difference between the first debate and third debate scores.

To conclude, the scores of students' English speaking ability which was obtained through comparison of the first and third debate sessions was analyzed with Wilcoxon Signed-Rank Test and indicated an enhancement in all four aspects of speaking ability. The statistical analysis showed a significant increase in scores between the first and third debate scores of the students participating in DIFLE.
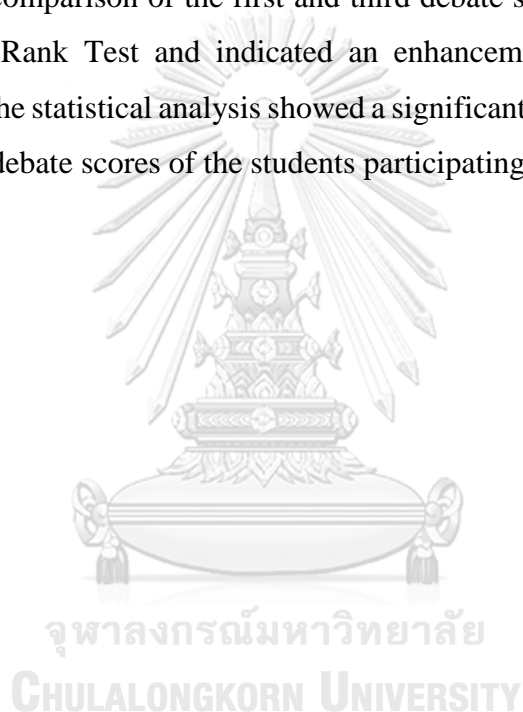
1.2.1 Debate results on case construction

Descriptive statistics showed a comparison between the first and the third debate scores. There is a difference in the scores of the first debate (Mean = 2.17, SD = 1.63, Min = 1, Max = 5) and the third debate (Mean= 3.79, SD = 0.83, Min = 2, Max = 5).

Table 72: Descriptive statistics of critical thinking in first and third debate

	Mean	SD	Minimum	Maximum
First debate	2.17	1.63	1	5
Third debate	3.79	0.83	2	5

N = 24

Table 73: The Wilcoxon Signed-Ranks Test on the first debate and third debate score of critical thinking

	N	Mean Rank	Sum of Ranks
Negative Ranks	4	5.25	21
Positive Ranks	17	12.35	210
Ties	3		
Total	24		

Z = -3.337; Sig (2-tailed) = .001

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference.

Table 80 showed that of all 24 students participated in the first debate and the third debate, 17 of students gained higher scores in the third debate, 3 students gain the same scores, and 4 of the students gained lower scores in the third debate compared to first debate.

The test indicated that the third debate scores was statistically significantly higher than first debate scores on case construction with Z value of -3.337 and at the significance level of 0.001. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a difference between the first debate and third debate scores.

1.2.2 Debate results on argument construction

Descriptive statistics showed a comparison between the first and the third debate scores. There is a difference in the scores of the first debate (Mean = 2.67, SD = 1.61, Min =1, Max = 1) and the third debate (Mean= 3.63, SD = 0.97, Min = 2, Max = 5).

Table 74: Descriptive statistics of critical thinking in first and third debate

	Mean	SD	Minimum	Maximum
First debate	2.67	1.61	1	5
Third debate	3.63	0.97	2	5

N = 24

Table 75: The Wilcoxon Signed-Ranks Test on the first debate and third debate score of critical thinking

	N	Mean Rank	Sum of Ranks
Negative Ranks	6	5.5	33
Positive Ranks	13	12.08	157
Ties	5		
Total	24		

Z = -2.542; Sig (2-tailed) = .011

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference.

Table 82 showed that of all 24 students participated in the first debate and the third debate, 13 of students gained higher scores in the third debate, 5 students gain the same scores, and 6 of the students gained lower scores in the third debate compared to first debate.

The test indicated that the third debate scores was statistically significantly higher than first debate scores on argument construction with Z value of -2.542 and at the significance level of 0.011. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a difference between the first debate and third debate scores.

1.2.3 Debate results on refutation of argument

Descriptive statistics showed a comparison between the first and the third debate scores. There is a difference in the scores of the first debate (Mean = 2.38, SD = 1.35, Min = 1, Max = 5) and the third debate (Mean=3.29, SD=1.23, Min = 1, Max = 5).

Table 76: Descriptive statistics of critical thinking in first and third debate

	Mean	SD	Minimum	Maximum
First debate	2.38	1.35	1	5
Third debate	3.29	1.23	1	5

N = 24

Table 77: The Wilcoxon Signed-Ranks Test on the first debate and third debate score of critical thinking

	N	Mean Rank	Sum of Ranks
Negative Ranks	8	8.25	66
Positive Ranks	15	14	210
Ties	1		
Total	24		

Z = -2.226; Sig (2-tailed) = .026

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference.

Table 84 showed that of all 24 students participated in the first debate and the third debate, 15 of students gained higher scores in the third debate, 1 students gain the same scores, and 8 of the students gained lower scores in the third debate compared to first debate.

The test indicated that the third debate scores was statistically significantly higher than first debate scores on the refutation of argument with Z value of -2.226 and at the significance level of 0.026. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a difference between the first debate and third debate scores.

1.2.4 Debate results on use of information

Descriptive statistics showed a comparison between the first and the third debate scores. There is a difference in the scores of the first debate (Mean=, SD=, Min = , Max =) and the third debate (Mean=15.38, SD=1.79, Min = 11, Max = 18).

Table 78: Descriptive statistics of critical thinking in first and third debate

	Mean	**SD**	**Minimum**	**Maximum**
First debate	2.08	1.32	1	5
Third debate	3.71	1	2	5

N = 24

Table 79: The Wilcoxon Signed-Ranks Test on the first debate and third debate score of critical thinking

	N	**Mean Rank**	**Sum of Ranks**
Negative Ranks	3	10.83	32.5
Positive Ranks	19	11.61	220.5
Ties	2		
Total	24		

Z = -3.095; Sig (2-tailed) = .002

A Wilcoxon Signed-Ranks Test was conducted to compare the median difference.

Table 86 showed that of all 24 students participated in the first debate and the third debate, 19 of students gained higher scores in the third debate, 2 students gain the same scores, and 3 of the students gained lower scores in the third debate compared to first debate.

The test indicated that the third debate scores was statistically significantly higher than first debate scores on use of information with Z value of -3.095 and at the significance level of 0.002. Therefore, there is sufficient evidence to accept the hypothesis which states that there is a difference between the first debate and third debate scores.

To conclude, the scores of students' critical thinking which was obtained through comparison of the first and third debate sessions was analyzed with Wilcoxon Signed-Rank Test and indicated an enhancement in all four aspects of critical thinking according to DIFLE rubric. The statistical analysis showed a significant increase in scores between the first and third debate scores of the students participating in DIFLE.

VITA

Liu I Wei is the Principal of KidsFirst International Kindergarten as well as the Head Teacher at Kev's Academy, an English teaching tuition center. His main research interests includes flipped learning environment, debate instruction, and teaching English productive skills such as speaking and critical thinking for specific purposes.