

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

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**Abstract:** Critical thinking skills in recent decades is considered as an essential skill needed for Thai high school students, to which the students' improvement in such skill is also a challenge that educators currently face. The National Education Act has also listed critical thinking as one of its main goals in the core curriculum of Thailand (Commission, 1999). To overcome this challenge, the integration of debate and flipped classroom was used to enhance Thai learner's critical thinking skills. This study employed Debate Instruction through a Flipped Learning Environment (DIFLE) to improve the Thai learner's critical thinking ability. The 9-week DIFLE sessions, including predebate, debate delivery and postdebate phases, were designed. The sample of the study was 24 Thai high school students in grade 10 to 12 in formal education in English Programs or Bilingual Programs in Bangkok. An intact group was conducted using pretest and posttest. The findings revealed positive effects of DIFLE on the critical thinking skills in the quantitative data resulting from the opinion questionnaire, and qualitative data from the focus group interview indicated the student's general satisfaction as well as their positive approval towards this study.

**Keywords:** Debate Instruction, Flipped Learning Environment, Critical Thinking Skills

### Introduction

In face of the challenges prompting the new generation, critical thinking skills has gained more recognition as essentials that educators must work to instill in their students. In terms of post-secondary education, Critical thinking ability has become indispensable for students who wish to continue their higher education for many reasons. The first reason is that critical thinking skills is what students need for admission to universities. Standardize exams such as TOELF, IELTS, and CUTEF 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. With the shortcomings of the student's 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 in fostering their critical thinking skills. In an effort to enhance Thai student's critical thinking skills, 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. Studies have shown that debate as an instructional method is effective in enhancing students' critical thinking skills (Agustiawati, Petrus, & Sitinjak, 2015; Alasmari & Ahmed, 2012; 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.

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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 (Garrett, Schoener, & Hood, 1996). 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 explored 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)

## Literature Review

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). As a result, critical thinking could be identified by its function in processing information: ranging from recognizing assumptions, evaluating arguments and draw conclusions, or Pearson Watson's Glaser "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. In an effort to enhance the critical thinking skills of students, debate instruction was employed in this study.

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. This study adapts the Broad Participant Debate Model in an attempt to accentuate inclusivity found from other existing models, and is designed to be consistent with the objective to enhance student's critical thinking ability. However, due to the limited amount of class hour, teachers often have to choose between giving students the domain knowledge or doing class activities, as doing both would be nearly impossible within the limited class hours.

In order to solve the problem of limited class hours, the flipped classroom approach was introduced. 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.

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. *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.

*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. 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.

### Conceptual Framework

The table shows the relationship between critical thinking skills, debate instruction, and flipped learning environment in order to create the instructional framework for this study.

**Figure 1: Conceptual Framework of DIFLE**

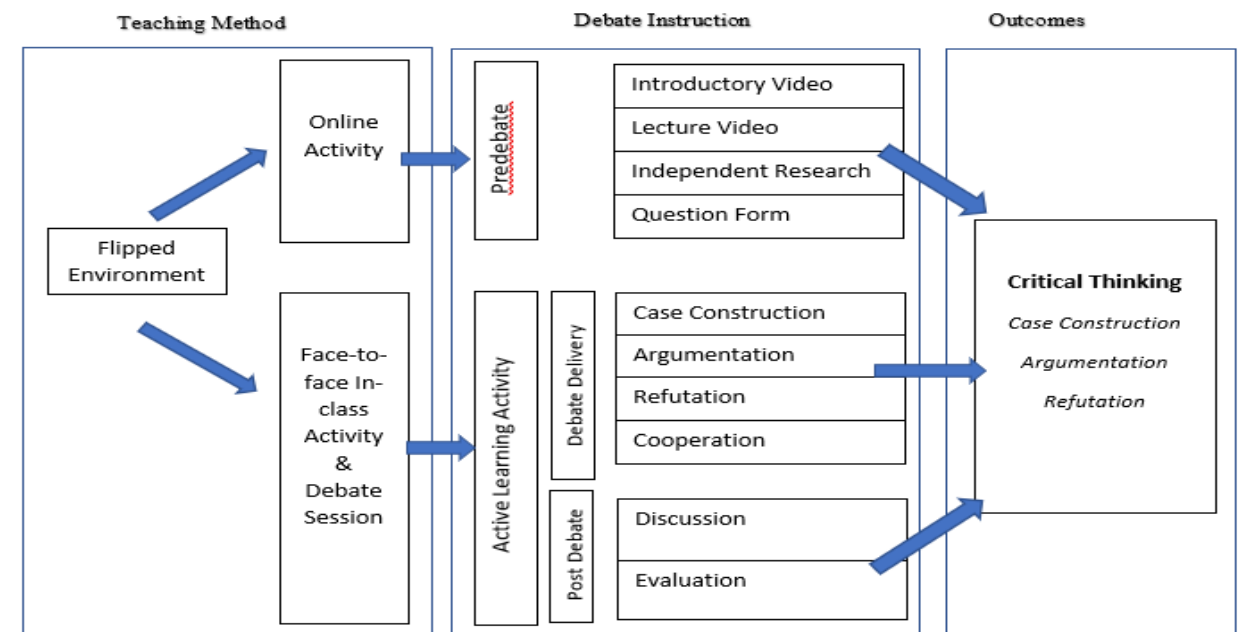
### Research Objectives

1. 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.

### Research Methodology

#### 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).

#### Debate Instruction Plan for DIFLE

Broad Participation Debate (BPD) model was employed in this study. 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 critical thinking skills were given by peers and the instructor, thus creating a feedback loop for the enhancement of students' performance in the area of 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' critical thinking skills and, additionally, form better understanding of the debating topic.

### *Research Instruments*

A combination of qualitative and quantitative approaches was used in this study. The details of the instruments and the data analysis are presents as follows.

#### 1. Pretest and Posttest

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

#### 2. 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.

#### 3. Focus Group Interview

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 4 parts ordered as follows: 1) engage questions; 2) DIFLE; 3) Critical thinking; and 4) 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. The answers were coded and analyzed through a coding scheme. Components of opinions consists of cognitive, affective, and behavior.

### **Research Findings**

Due to the limited number of participants, the study employed an intact group and used a Wilcoxon signed rank test to assess the students' critical thinking skill scores.

#### 1. The effects of DILFE on students' critical thinking skills.

The finding in this part is correlated with objective 1: To study the effects of Debate Instruction in Flipped Learning Environment on Thai High School Students' critical thinking skills.

#### *1.1 The overall scores*

**Table 1: Descriptive statistics of the overall scores of critical thinking in pretest and posttest**

	<b>Mean</b>	<b>SD</b>	<b>Minimum</b>	<b>Maximum</b>
Pretest	17.916	5.241	8	28
Posttest	26.125	3.442	19	32

N=24

**Table 2: The Wilcoxon Signed-Ranks Test of the overall scores of critical thinking in pretest and posttest**

	N	Mean Rank	Sum of Ranks
Negative Ranks	1	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.

### 1.2 The scores of each component of critical thinking skills

**Table 3: Wilcoxon Signed Rank Test of critical thinking skills pretest and posttest**

	N	Ties	Mean Rank	Summary of Rank
Inference	24	2	-	-
Negative Ranks	6		7.25	43.5
Positive Ranks	16		13.09	209.5
Recognition of Assumptions	24	2	-	-
Negative Ranks	5		9.2	46
Positive Ranks	17		12.18	207
Deduction	24	2	-	-
Negative Ranks	4		8.88	35.5
Positive Ranks	18		12.08	217.5
Interpretation	24	3	-	-
Negative Ranks	4		10.25	41
Positive Ranks	17		11.18	190
Evaluation of Arguments	24	2	-	-
Negative Ranks	9		11.72	105.5
Positive Ranks	13		11.35	147.5

Table 4 shows the result of the Wilcoxon signed rank test of each component of the critical thinking skill. Out of 24 students, inference, recognition of assumption, deduction, interpretation, and evaluation had 16, 17, 18, 17, and 13 positive ranks, respectively.

## 2. Students' Opinion of DIFLE

The finding in this part was correlated with objective 2: To study the opinions of high school students towards learning Debate Instruction in a Flipped Learning Environment.

### 2.1 The questionnaire's results

The questionnaire results were divided into 5 parts. The following table presents the grand mean score of each part and its standard deviations.

**Table 4: Students' opinion toward DIFLE**

Parts	Questionnaires' items	Mean	S.D.
Part 1	Items 1-15: Students' opinion toward the 'Predebate phase' stage of DIFLE	4.26	0.83
Part 2	Items 16-17: Students' opinion toward the 'Debate Delivery' stage of DIFLE	4.25	0.82
Part 3	Items 18-23: Students' opinion toward the 'Post Debate' stage of DIFLE	4.32	0.62
Part 4	Items 24-27: Students' opinion toward the overall DIFLE	4.66	0.57
Part 5	Items 32-35: Students' opinion toward DIFLE on Critical thinking skills	4.5	0.67
Total		4.37	0.7

Table 6 illustrates the students' opinion toward DIFLE. The mean score of the overall questionnaire was 4.37 (S.D. = 0.7). The mean score of part 1 shows that students were satisfied with the "predebate phase" stage of DIFLE (mean=4.26, S.D.=0.83). The mean score of part 2 shows that students were satisfied with the "debate delivery phase" stage of DIFLE (mean=4.25, S.D.=0.82). The mean score of part 3 shows that students were also satisfied with the "post debate" stage of DIFLE (mean=4.32, S.D.=0.62). The mean score of part 4 shows that overall, students were relatively more satisfied with DIFLE (mean=4.66, S.D.=0.57). Lastly, the mean score of part 5 shows that students were satisfied with the "critical thinking" component of DIFLE (mean=4.5, S.D.=0.67).

### 2.2 Focus Group Results

To obtain more in-depth information on the students' attitude toward DIFLE, thirteen open-ended focus group interview questions were employed with six students. The students' responses were recorded and coded under the elements of affective, cognitive capability, and behavioral component. The results showed that the frequently mentioned components were positive affective and positive behavioral.

#### 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."

#### 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."

## Discussions

This study set out to assess the impact of the Debate Instruction in Flipped Learning Environment (DIFLE) on the students' 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' critical thinking skills after implementing DIFLE; 2) the students' opinion towards DIFLE.

### 1. *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 (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, Ishikawa, & Flander, 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 conclusion* 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.

### 2. *The flipped learning environment in DIFLE*

The other key component for this section that contributes significantly to the critical thinking skills 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' critical thinking skills are 1) online platform; 2) flexible learning;

#### *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 Bransford, 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. 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 "I liked the introductory videos. They allow me to really know the materials and help with my critical thinking skills". 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.

### *Flexible learning*

The second factor that improves the students' critical thinking skills 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). 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 critical thinking 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.

### *3. The student's Opinion towards DIFLE*

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' critical thinking 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.

### Conclusion and Suggestions

The following are some areas that could be investigated for further studies, according to this research study.

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 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.

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