

Using Ideation Discussion Activities in Design Thinking to Develop EFL Students’ Speaking and Critical Thinking Abilities

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APA Citation: Buphate, T. & Esteban, R. H. (2022). Using ideation discussion activities in Design Thinking to develop EFL students’ speaking and critical thinking abilities. <i>LEARN Journal: Language Education and Acquisition Research Network</i> , 15(1), 682-708.	
Received 02/10/2021	Abstract Ideation, a phase of Design Thinking, merged with discussion activities is one innovative tool to encourage learners to speak and think critically towards a given topic. This research was conducted primarily to investigate the effects of ideation discussion activities in Design Thinking to speaking and critical thinking abilities of English as a Foreign Language (EFL) learners as well as their perception towards the concept. There were eight participants in the research study. Pre-test and post-test in speaking and critical thinking abilities, a set of survey forms, and participants’ reflective essays were the instruments used in the study. Descriptive statistics, paired sample T-test, and content analysis were employed to measure the data gathered after the participants attended the 84-hour sessions of ideation discussion activities in Design Thinking course at
Received in revised form 29/12/2021	
Accepted 05/01/2022	
Keywords ideation, discussion, Design Thinking, speaking ability, critical thinking	

	Rajamangala University of Technology Lanna (RMUTL), Chiang Mai. Results revealed that these ideation discussion activities in Design Thinking were relevant to enhance EFL learners' speaking and critical thinking abilities. The level of agreement and the satisfaction of learners were high after they attended the sessions. It could be said that ideation discussion activities in Design Thinking could possibly enhance speaking and critical thinking abilities of EFL learners.
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Introduction

Background of the study

Design Thinking, being a framework for innovation, has been garnering an increasing popularity in the business sectors, forward thinking companies, and even universities. According to Interaction Design Foundation by Dam and Siang (2020), Design Thinking is a repetitive process where a user is being understood, then assumptions are being challenged, and problems are reimaged to produce alternative strategies and solutions which cannot be detected at first thoughts. It has started since 1950, but it has gained its recognition around 2010. According to the toolkit of Singapore Polytechnic (SP) (2011) Department of Educational Development, the Design Thinking process includes sense and sensibility, empathy, ideation, and prototype. Among the four stated phases in the cycle, ideation seems to be the most challenging one.

Rajamangala University of Technology Lanna (RMUTL) has partnered with Singapore Polytechnic (SP) to establish the so-called Learning Express (LeX) program which trains and prepares students of both universities to apply the four stages of Design Thinking in providing alternative solutions to the problems in the communities. It has been on its fifth year, but due to the effects of COVID-19, the collaborative efforts to bring students of both universities cannot be met. However, RMUTL, specifically the Office of International Relations (OIR), regularly conducts activities to employ its services in enhancing the skills of RMUTL students with the aid of Design Thinking. In 2020, RMUTL, in cooperation with SP, staged the Youth Model ASEAN (YMAC) 2020 e-Conference for RMUTL's representative students to work with other students from various

countries. This is a platform for them to research, discuss, and formulate action plans to solve problems and challenges relating to the UN sustainable development goals and the impact of COVID-19 in ASEAN countries. Consequently, the RMUTL participants of this gathering were expected to learn and practice more about ideation discussion activities in Design Thinking which would target to enhance their speaking and critical thinking abilities.

Ideation in Design Thinking, sometimes more well-known as 'ideate,' is the third step in the four-phase process. It is an approach where forefront leaders and participants in Design Thinking caucus challenge assumptions and create ideas for innovative solutions. In RMUTL, this phase is where students need to brainstorm and discuss ideas and critically analyze them as alternative solutions for an existing problem in the process. Students are being taught and guided to think and speak out some ideas that could be beneficial in the ideation process. They are given some activities to cultivate their critical thinking ability, and later on, their speaking capacity to offer solutions to problems for innovation purposes.

There is particularly a stimulating challenge on how RMUTL students work on the ideation phase in Design Thinking through discussion activities. Discussion activities require speaking skills among EFL learners. Moreover, ideation discussion in Design Thinking is a new pedagogical approach to enhance learners' skills in speaking. There has been scarce information with regards to Design Thinking alongside ideation discussion or speaking in the ideation phase, however there are some pertinent studies that have been recently done showing some optimistic results in the utilization of ideation discussion in Design Thinking to enhance the speaking skills of learners. In a study of Cleminson and Cowie (2021) which was conducted in an EFL classroom in Japan, it was found out that Design Thinking could enhance collaborative engagement and communicative competence of learners. For EFL learners, the greater challenge rests on how they convey their ideas to each other using another language which is English, not their native language. Ideation discussion activities in Design Thinking may also bring out their critical thinking competence aside from their speaking ability.

Therefore, this research aimed to find clarity to the following:

- 1) To what extent do ideation discussion activities in Design Thinking enhance EFL students' speaking and critical thinking abilities?
- 2) What are the perceptions of students towards the use of ideation discussion activities in Design Thinking in the development of their speaking and critical thinking abilities?

Related Literature

Design Thinking

One of the most novel definitions of Design Thinking is the idea stating that it is an intentional search for something new. This is true to the statement of Rowland (2004) deeming that Design Thinking is an intentional act. Other experts in Design Thinking have coined clear and easily understandable meanings of Design Thinking. Tschimmel (2012) once said that Design Thinking is believed as a way of thinking resulting into innovation and development. Among the definitions of Design Thinking that have emerged, Razzouk and Shute (2012) seem to have a very clear one stating that Design Thinking is a process, analytically and creatively, involving the tasks like experimenting, creating and prototyping models, gathering feedback, and redesigning. Design Thinking is a model, according to Lawson (2004), and it is not only a methodology.

Rotherham and Willingham (2009) challenged learners to read more critically, give out reasons, and be able to give solutions to intricate problems at schools. In order for young learners to be more successful in their generation, educators should be able to help them in the development of their skills which include the use of Design Thinking as a method and a process. This was also agreed upon in the work of Shute and Torres (2012) saying that the skills Design Thinking offer can help enhance their skills for schools and workplaces.

Ideation in Design Thinking

Design Thinking can be categorized into four phases which include sense and sensibility, empathy, ideation, and prototype as suggested by SP Department of Educational Development (2011). Sense

and sensibility navigates on all the senses to search information and stimulates learners' minds. Empathy is about understanding users in a way that the learners have to feel like they become the users. In this part, empathy, ethnography, interview and observation, analysis tools, insights generation are given emphasis. Ideation phase is about generating various ideas and theories with the aid of tools used in ideation. These ideas and concepts will then be developed into concepts and only one concept will be selected in the end. The last phase is prototype which refers to the process of making concepts tangible and real and it is also about the relationship between concept and user experience. Hence, learners are encouraged to explore with users in the four stated phases with minimal focus on application.

This study focused mainly on the ideation phase and its relationship with speaking skills and critical thinking ability of EFL learners.

Speaking skills

Speaking, as one among the four skills in English including listening, writing, and reading, gives much emphasis on pronunciation, vocabulary, grammar, and discourse in a traditional classroom. However, Burns (2017) stated that learners in this type of classroom realize that these focuses are inadequate for them to be effective speakers. Thus, it is even more challenging in an EFL classroom because of the complexity of speaking where learners or speakers have to multi-task in the speaking process (Johnson, 1996).

Speaking is one skill an EFL student has to work on though it is challenging in many facets. According to Bashir et al. (2011), speaking is an oral type which should be a dynamic skill. They further added that speaking skill is not merely just pronouncing words but it can be complicated sometimes because of various factors. This shows that speaking can bring much pressure to EFL students. Speech can be said that it is mainly on making choices on how to express and interact from one student to another. In Hall's (1981) study, he mentioned that speaking is taken lightly, even learned lightly as it is a process of socialization through communicating. Speaking is making use of language in ordinary voice, uttering words, and making speech. It can be summarized that speaking is a tool for someone to convey ideas to

another verbally. Furthermore, language learning is equivalent to learning a wide variety of skills (DeKeyser, 2007) making it quite challenging for EFL learners' oral construct.

In Levelt's (1989) modular model of speech production, it might have been one of the realistic approaches for monolingual speech production. He promulgated the two core systems in speech production namely meaning-making system and articulatory system. As a summary to Levelt's concepts in speech production, the stated concepts are structured as a preparation to convert them into words. The ability of the speakers to express their thoughts depends on their maximum multi-tasking power from the conceptualization process to the production of words with emphasis on pronunciation, vocabulary, grammar, and discourse.

In the study of Katoroi (2015), it was mentioned that discussion is one of the ways a student can get involved in speaking. He further explained that discussion may not be successful when learners hesitate to give their opinions in the class, especially when they are unable to think of anything to say prompting them to lose confidence in speaking the language. Following Riyanto's (2015) paper, it shows that small group discussion is one effective way to enhance the speaking ability of secondary vocational students. In this regard, the relationship of speaking, discussion, and EFL learners have to be interconnected with each other to achieve favorable results in conveying ideas and thoughts.

Ideation Discussion Activities in Design Thinking

According to Buphate et al. (2018) ideation is about producing several ideas and concepts using tools suitable for the stated phase. Learners have to construct a great number of ideas and then turn them into concepts. The end of the process is to select one final concept as a final project to work on. Learners ought to write one idea in a piece of post-it paper as a part of the brainstorming process. Sketching is also suggested in lieu of or in combination with words. This phase deals with action, environment, and other elements that words could not be expressed solely. After that, the learners have to choose 3-5 ideas to be yielded as a concept using the 2x2 matrix and weighing scale rubrics. A concept can be described as *the big picture* or something shaped by combining all its features or details, a *construct* of different ideas. In this

phase, it is observed that the learners could display knowledge in social innovation to search appropriate ideas for the issues. Furthermore, communication skill in English is also necessary, especially speaking skills to express ideas which is also applicable in negotiating process with other students. In addition, critical thinking should also be used as students have to think and create suitable ideas, and answers to questions or issues raised within the phase process.

Critical Thinking Ability

Critical thinking is state of having central and clear process used in mental activities such as solving problems, making decisions, persuading, analyzing assumptions, and conducting scientific research according to Johnson (2002).

With the stated concept, critical thinking ability is crucial in an EFL classroom. Fisher (2001) claimed that although critical thinking skills are taught “to assist their transfer to other subjects and other contexts,” they are not considered to be taught in an intercultural context. Atkinson (1997) also expressed doubts on the appropriateness to critical thinking in an EFL class. However, Tsui (1999) stated in his report that students’ growth could be seen in the integration of critical thinking in a variety of disciplines, including foreign language courses. He evaluated the role of the type of course and form of instruction, and found that both need to have association with critical thinking in order for students’ report growth. Moreover, a slightly greater impact was found for instruction.

Design Thinking vis-à-vis Speaking Skill and Critical Thinking Ability in EFL Classrooms

The emergence of Design Thinking has revolutionized not only the business sphere but also the education sector. With the conceptualization of Design Thinking to be integrated in classroom, even in EFL classrooms, there are several studies which can be considered successful with its possible integration in EFL classrooms.

In the study of Cleminson and Cowie (2021), it revealed that Design Thinking has good effects for learners to speak confidently and think flexibly. It further showed positive feedback from learners about

creative communication and engagement. However, Design Thinking should be carefully included by teachers or instructors in their courses in any approach ideally based on the linguistic competence of students.

Another paper which discusses Design Thinking in an EFL classroom, Ollerenshaw (2019) explained the potential possibility of Design Thinking in language learning. In her critical explanation of her work, Design Thinking, even in the use of instructional language learning material, ideational and iterative elements of Design Thinking contributed to the development of learners' language and thinking skills.

Kohls (2019) reiterated the importance of Design Thinking in the tertiary level of learning, and both educators and learners have to think of ways on how to study and apply it in any way possible.

Furthermore, in Helwan University, Egypt, Mohammed (2021) confirmed that there are good effects of Design Thinking in hybrid learning environment on developing persuasive speaking for the 4th year English students. The study also suggested that teachers should give focus on the development of persuasive speaking skills through Design Thinking.

The suggested inclusion of Design Thinking in language curricula in a Colombian university garnered positive feedback from a Colombian university. Crites and Rye (2020) explained in their study that the inclusion of Design Thinking in Language Curriculum Design (LCD), the process could turn courses into more collaborative, creative, and efficient ones.

Methodology

Participants and Ideation in Design Thinking Discussion Activities Procedures

The participants of the study consisted of eight RMUTL students: four undergraduate students majoring in English for International Communication (EIC) at the Faculty of Business Administration and Liberal Arts (BALA); two undergraduate students majoring in Mechatronics Engineering; and two vocational education diploma students majoring in Pre-Engineering at College of Integrated Science and Technology (CISAT). These participants joined in the Youth Model ASEAN Conference - YMAC 2020 Program under the Office of International Relations (OIR), RMUTL, Chiang Mai, thus, they were selected purposively

to be the participants of the study. These participants were immersed in the Ideation Discussion Activities in Design Thinking Course and the Youth Model ASEAN Conference - YMAC 2020 Program on October 18, 25, 31, November 1, 7, 15, 22, 29, December 21, 22, 23, and 27, 2020 with 7-hour a session totaling to 84 hours.

Instrumentation and Data Collection

The data collection was purely from the participants who attended in the Ideation Discussion Activities in Design Thinking Course and the Youth Model ASEAN Conference - YMAC 2020 Program from October 18 - December 27, 2020 totaling to 84 hours of immersed experience both lecture and hands-on participation. Pretest and post-test related to ideation in Design Thinking discussion activities, a survey questionnaire, and reflective papers were employed to collect the required data. They are the following:

Pre-Test and Post-Test in Speaking

The pre-test and post-test were related to ideation in Design Thinking activities which consisted of four questions for each participant. The pre-test and post-test in speaking related to ideation in Design Thinking activities were evaluated by three experts in the field of Teaching English as a Foreign Language (TEFL) using speaking skills evaluation rubrics and critical thinking ability measurement rubrics for testing the students' speaking and critical thinking abilities. The rubrics were carried out to give marks to individual participants at the beginning of the activity as a pre-test evaluation record. The pretest was conducted on the first day of the Ideation Discussion Activities in Design Thinking Course on October 18, 2020. After the pre-test, the participants attended the 84- ideation discussion activities which were patterned from the Design Thinking toolkit of Singapore Polytechnic (SP) Department of Educational Development (2011). The ideation in Design Thinking discussion activities consisted of three (3) phases: 1) ideation in Design Thinking discussion activities pre-test 2) ideation in Design Thinking discussion activities practice, and 3) ideation in Design Thinking discussion activities post-test. All the ideation approaches in the Design Thinking discussion activity tests consist of three parts: idea

brainstorming, 2×2 matrix, and weighing scale rubrics for practicing and testing the learners' speaking and critical thinking abilities. At the end of the activity, a post-test was administered as an evaluation record similar to the pre-test. The post-test was executed on the last day of the Ideation Discussion Activities in Design Thinking Course.

The pre-test and post-test questions were validated by three jurors and experts in language and Teaching English as a Second Language (TESOL). The elements of the questions according to being material worthy, construction worthy, and language worthy. The result of the pre-test and post-test was specified in percentages as shown in Table 1:

Table 1

Validity results of pre-test and post-test scores

Elements of the Questions	Validity Score	Category
Material worthy	100%	Very valid
Construction worthy	100%	Very valid
Language worthy	100%	Very valid

Survey Questionnaire

This instrument was adopted from Zare and Othman (2015) and was administered at the end of the study to explore students' feedback about their experience attending ideation in Design Thinking discussion activities. This instrument had twenty-one items with a 5-point Likert scale: strongly agree – 5, agree – 4, neutral – 3, disagree – 2, strongly disagree - 1. The interpretation of the Likert scale is as follows:

- a) The average of 4.51-5.00 means that the participants strongly agreed to the statements.
- b) The average of 3.51-4.50 means that the participants agreed to the statements.
- c) The average of 2.51-3.50 means that the participants' position was neutral to the statements.
- d) The average of 1.51-2.50 means that the participants disagreed to the statements.

- e) The average of 1.00-1.50 means that the participants strongly disagreed to the statements.

The items of the questionnaire were developed according to the objectives of the study. Moreover, they focused on learners' perceptions about the ideation in Design Thinking discussion activities experience, the effect of ideation discussion towards the speaking and critical thinking abilities of students, and how ideation discussion had helped the students in the improvement of their skills. The statements in the survey form were evaluated by three experts in the field of TEFL and Literature for content validity assessment regarding Index of Objective Congruence (IOC). Every item was between 0.64-0.98 which was greater than 0.50; therefore, all items were considered valid.

The survey questionnaire was distributed to the participants at the end of the Ideation Discussion Activities in Design Thinking of the Youth Model ASEAN Conference - YMAC 2020 Program on December 27, 2020.

Reflective Papers

Students were asked to write their ideas as reflective reference for the activities they have joined in. The purpose of these papers was to investigate students' perceptions and feedback to the ideation in Design Thinking discussion activities experience through writing. In this regard, an open-ended questionnaire was used by the researchers consisting of four (4) questions and distributed among the students to help them focus on relevant issues in their reflections. The questions focused mainly on students' perceptions, feelings, weaknesses, benefits, advantages, and disadvantages of ideation in Design Thinking discussion activities experience. One of the questions also that was asked to the participants was to discuss their suggestions or recommendations to further improve the approach.

Data analyses

Quantitative Results

The quantitative results were derived from the pre-test and post-test in speaking related to ideation in Design Thinking activities, and a

survey questionnaire. For the pre-test and post-test in speaking results, they were analyzed using Paired Sample T-test in order to evaluate whether the ideation discussion activities in Design Thinking sessions affected the results from pre-test to post-test. The survey results were analyzed using descriptive statistics—mean and standard deviation (SD). These statistical operations were done with the aid of the Statistical Package for the Social Sciences (SPSS) 27 program.

Qualitative results

The qualitative results were derived from reflective papers. They were evaluated and categorized using conceptual content analysis.

Locale of the study

This study was conducted at Rajamangala University of Technology Lanna Chiang Mai. It is located in the northern city of Thailand called Chiang Mai. It was founded as College of Technology and Vocational Education, and then later established under the name of Rajamangala University of Technology Lanna on January 18, 2005. It consists of four campuses: Jedlin campus (main campus), Jed Yod campus, Doi Saket campus, and Chom Thong campus. It consists of four faculties and one college: Faculty of Engineering, Faculty of Business Administration and Liberal Arts, Faculty of Architecture and Fine Arts, and College of Integrated Science and Technology. It offers various courses such as Certificate in Vocational Education, High Vocational Education, Bachelor Degree, and Master Degree. As of today, RMUTL Chiang Mai has more than 10,000 students.

Results

This part of the research presents the results and findings from data collection. It is divided into three (3) parts namely:

Part I. Results of pre-test and post-test scores;

Part II. Results of the survey questionnaire; and

Part III. Results on the analysis of the reflective papers from the participants.

Results of Pre-Test and Post-Test Scores in English Speaking and Critical Thinking Abilities

Participants of this research took two tests, pre-test and post-test, each in English speaking and critical thinking conducted on the first and last days of the Ideation Discussion Activities in Design Thinking Course. In order to find the relationship of the pre-test scores and post-test scores whether the ideation discussion activities affected the scores, a paired sample t-test in SPSS was employed.

Speaking Test

Table 2

Mean scores of the English-speaking ability test among participants before and after the ideation discussion activities in design thinking

	N	(\bar{x})	SD	P-value
Pre-test	8	2.25	0.86	0.000*
Post-test	8	3.22	0.93	

*Level of significance 0.05

Table 2 illustrates the detailed descriptive statistical results of the pre-test and post-test scores of the participants after they participated in the ideation discussion in Design Thinking activities. The individual English-speaking test scores composed of (4) criteria: fluency, pronunciation, vocabulary, and grammar. The scores in each of the criteria were added to get the mean score of each of the participants. The highest score in both tests is 4.

Paired sample T-test was computed to determine whether the mean of post-test scores of the participants who joined in the ideation discussion in Design Thinking activities significantly differs with the mean in their pre-test scores. Results show that the mean of the post-test scores (mean = 3.22, SD= 0.63) is significantly higher than the mean of the pre-test scores (mean = 2.25, SD = 0.86) , $t(7) = - 8.1$, $p < 0.05$. It implies that ideation discussion in Design Thinking activities have significant effect on the post-test scores.

Table 3

Mean scores of the four criteria in the English-speaking ability test results among participants before and after the ideation discussion activities in design thinking

Criteria in Speaking Test		N	(\bar{x})	SD	P-value
Fluency	Pre-test	8	2.25	0.71	0.000*
	Post-test	8	3.25	1.04	
Pronunciation	Pre-test	8	2.38	0.71	<0.001*
	Post-test	8	3.25	0.92	
Vocabulary	Pre-test	8	2.63	0.52	0.000*
	Post-test	8	3.38	0.72	
Grammar	Pre-test	8	1.75	0.76	0.190
	Post-test	8	3.00	0.89	

*Level of significance 0.05

It can be seen in Table 3 that the highest mean in pre-test and post-test among the four criteria in the English-speaking ability test was vocabulary (\bar{x} -2.63 for pre-test and \bar{x} -3.38 for post-test). Moreover, it also shows that ideation discussion activities in Design Thinking have effect between the two means scores ($p=0.000$). In fluency (\bar{x} -2.25 for pre-test and \bar{x} -3.25 for post-test and pronunciation (\bar{x} -2.38 for pre-test and \bar{x} -3.25 for post-test), ideation discussion activities in Design Thinking shows positive effects between their mean scores ($p=0.000$ and $p<0.000$ respectively). However, it can be seen that ideation discussion activities in Design Thinking does not have any effect on grammar mean scores in the pre-test (\bar{x} -1.75) and post-test (\bar{x} -3.00) of the participants ($p=0.190$).

Critical Thinking Test

Another test which was to measure the critical thinking ability of the participants was conducted on the first day and the last day of Ideation Discussion Activities in Design Thinking Course. The results are as follows:

Table 4

Mean scores of the critical thinking ability test among the participants before and after the ideation discussion activities in design thinking

	N	(\bar{x})	SD	P-value
Pre-test	8	2.10	0.68	0.018
Post-test	8	2.6	0.50	

*Level of significance 0.05

Table 4's results show that the mean of posttest scores (mean = 2.6, SD= 0.50) is significantly higher than the mean of the pretest scores (mean = 2.10, SD = 0.68), $t(7) = -1.0$, $p < 0.05$. Ideation discussion activities in Design Thinking have had significant effect in the improvement of the critical thinking ability of the participants.

Table 5

Mean scores of the criteria in the critical thinking ability test among participants before and after the ideation discussion activities in design thinking

Critical Thinking Ability Test		N	(\bar{x})	SD	P-value
Logic and Reasoning	Pre-test	8	2.0	0.76	0.351
	Post-test	8	2.13	0.64	
Creative Critical Thought	Pre-test	8	2.63	0.52	0.032*
	Post-test	8	3.00	0.65	

*Level of significance 0.05

Creative critical thought garnered higher mean scores ($\bar{x}=2.0$ for pre-test and $\bar{x}=2.13$ for post-test) compared to logic and reasoning mean scores ($\bar{x}=2.0$ for pre-test and $\bar{x}=2.13$ for post-test). Ideation discussion activities in Design Thinking seems to have effects in the mean scores in creative critical thought ($p=0.032$). However, in logic and reasoning, ideation discussion activities in Design Thinking have no effect in the mean scores ($p=0.351$).

Results of the survey questionnaire

At the end of the program, the participants evaluated the ideation discussion activities in Design Thinking. Table 3 illustrates the mean of each of the statements concerning the program with a highest score of 5.

Table 6

Mean score from the 21 statements of the survey form answered by the participants of ideation discussion activities in design thinking

	N	Standard Deviation (SD)	Mean (\bar{x})
TOTAL (21 statements)	8	0.54	4.57

After the ideation discussion activities in Design Thinking, the participants answered a survey form to evaluate the program. The mean (\bar{x}) score of the survey was 4.57 (S.D. = 0.54) with a strong level of agreement. Remarkably, the participants had a high regard towards the ideation discussion activities in Design Thinking.

Table 7

Highest means from the 21 statements of the survey form answered by the participants of ideation discussion activities in design thinking

Statements	N	Standard Deviation (SD)	Mean (\bar{x})
2. I liked and enjoyed ideation discussion and I found it interesting.	8	0.35	4.88
19. Ideation discussion helps students learn to care and show sensitivity to others' feelings and knowledge level.	8	0.35	4.88
20. Ideation discussion improves oral communication and argumentation skills.	8	0.35	4.88
21. Ideation discussion helped me improve my speaking skills.	8	0.35	4.88

Table 8

Lowest means from the 21 statements of the survey form answered by the participants of ideation discussion activities in design thinking

Statements	N	Standard Deviation (SD)	Mean (\bar{x})
6. Ideation discussion enhances learning on the course content.	8	0.53	3.00
11. Ideation discussion helps learners realize that issues are not merely black and/or white.	8	0.52	3.63

Among the 21 statements included in the survey form, the following four (4), as seen in Table 8, garnered the highest mean (\bar{x}) score at 4.88: 'I liked and enjoyed ideation discussion and I found it interesting,' 'Ideation discussion helps the participants learn to care and show sensitivity to others' feelings and knowledge level.' 'Ideation discussion improves oral communication and argumentation skills,' and 'Ideation discussion helped me improve my speaking skills.' On one hand, two (2) among the 21 statements gathered 3.63 and 3.0 mean scores (\bar{x}) as seen in Table 7. The two statements are as follows: 'Ideation discussion helps learners realize that issues are not merely black and/or white,' and 'Ideation discussion enhances learning on the course content,' respectively.

It could be summed up that ideation discussion activities in Design Thinking are interesting, can help improve oral or speaking ability, and can foster empathy among the participants.

Results on the Analysis of the Reflective Papers from the Participants

After the 84-hour participation in the ideation discussion activities in Design Thinking Course and the Youth Model ASEAN Conference 2020 - YMAC 2020 Program, the participants documented their feedback and opinion. The participants wrote their perceptions on the ideation discussion activities in Design Thinking. These are the excerpts of the participants' feedback and opinions:

The participants wrote that they:

1. Improved their speaking ability
 - *I have learned how to speak and express my ideas in English clearly and fluently*
 - *Ideation discussion activities really provided me the essential speaking skill in working with foreign friends*
 - *The activities helped me to explain things in English clearly and concisely*
 - *Our oral communication skills have improved significantly*
 - *This is very useful for me in the development of my speaking skill*
 - *This really helped me to be more fluent in speaking the English language*
 - *We practiced a lot about public speaking*
 - *I got to learn and improve my speaking skill*
 - *The ideation discussion activities in Design Thinking Course really boosted my speaking and critical thinking skills*
 - *The activities have helped me to be more efficient with my English speaking skill*
 - *This project has improved my discussion skill*
 - *We learned how to be more argumentative in our speeches*
 - *I was surprised that I could answer the questions my friends had asked me in English*

2. Improve their critical thinking ability
 - *Ideation discussion activities have helped me to think more critically*
 - *Singaporean students taught me how to think critically*
 - *Ideation discussion promotes critical thinking skill*
 - *The activities were very instrumental to develop my critical thinking ability*
 - *I learned how to think in critical ways*
 - *I got a chance to practice my critical thinking ability*
 - *I got to learn and improve my critical thinking ability*
 - *Some discussions made me think critically*
 - *We used a lot of creative critical thoughts*

3. Learned team work

- *I have learned how to work as a team*
- *I could express my ideas and work with others in my group very well*
- *I learned companionship with others in my group*
- *The bonding of the group grew really fast*
- *Ideation discussion promoted teamwork skills*
- *We learned to help each other*
- *I learned how to coordinate with others in my group*
- *I learned how to work with others*
- *I gained plenty of experience*
- *I really had lots of experience*
- *This was such a wonderful experience*
- *It is a wonderful opportunity to have new experience*
- *We bonded with each other almost all the time*
- *I could make new friends*
- *I made some connections from some countries in the ASEAN*
- *The foreigners were very friendly*

4. Learned to respect other's opinion

- *This taught me to be more open-minded to those who do not share the same views as mine*
- *I gained deeper understanding of the different perspectives of others*
- *I learned to respect others when they give their ideas*
- *I understood how to listen to other's ideas*

5. Boosted their Confidence

- *I was more confident in expressing my ideas in English*
- *I was more confident to communicate with people*
- *I felt much more confident than before joining the ideation discussion activities*
- *I feel like I have improved my confidence in speaking English*
- *This really helped me to be more confident*

6. Learned about culture

- *We tried to understand the topics and culture concisely*

- *We knew and accepted each other's cultural differences*
 - *We shared our culture towards one another*
7. Learned to be more investigative
 - *Ideation discussion activities in Design Thinking allowed us to seek precise and truthful information*
 - *We did research a lot about different topics in order to gain understanding about a given topic*
 8. Thought the program was interesting
 - *The ideation discussion activities in Design Thinking were very interesting*
 - *It was really an interesting program*
 9. Can use in the future what they learned in the program
 - *I can use these skills that I have learned in the future*
 - *This course has given me enough tools to succeed for any social conference later*
 10. Learned new concepts
 - *I learned new concepts*
 11. Learned to be responsible
 - *This course helped me be more responsible*
 - *I have become more punctual when I attend an activity*
 - *We learned to be more empathic towards one another*
 12. Were pressured
 - *This program gave me some pressure because I had to work very hard*

Most of the participants in the ideation discussion activities in Design Thinking believed that the program has improved their speaking ability. Moreover, they considered that the program has helped them think critically. Aside from these, they commented that they have boosted their confidence, built relationship with others, understood other's opinions, perspective, and culture. Noticeably, one of them has answered that the program gave him pressure because he had to work

hard all throughout the ideation discussion activities in Design Thinking course.

Discussion and Implications

Design Thinking shows extensive optimism towards its use in inter- and multi-disciplinary educational settings as indicated by Carroll et. al (2014) and Wright and Wrigley (2019) which is also analogous to the findings of this research paper.

Meanwhile, Mohammed (2021) identified that speaking skill of EFL learners in Egypt could be enhanced through Design Thinking which is similar to the findings of this study stating that speaking skills of the students as participants have been enhanced whether statistically or based on their perception of their own skills after the course intervention.

The results of this research explained that discussion in the ideation phase of Design Thinking assisted in the improvement of the skills of learners specifically speaking and critical thinking. This was agreed upon the results of study of Konchiab and Pojchanaphong (2018) asserting that design thinking process is a good way to learn especially for innovation skills, including English language communication, interpersonal communication, problem solving and critical thinking.

Although Goldman et al. (2014) stated that teaching and learning Design Thinking is a complex process, still, Thai EFL learners found it interesting and beneficial to upgrade their skills in English. It could be noted that Thai EFL learners tend to have a positive approach on the ideation process in Design Thinking as it fosters communication or speaking skill, and critical thinking.

In the recent findings of Buphate et al. (2018), Design Thinking as whole process which includes ideation phase garnered positive response from EFL learners. Their study showed significant improvement in the communication skills in English and critical thinking ability as they learned Design Thinking. This is also parallel to the opinions and the results of the tests among the learners in this study.

Another study from Konchiab and Pojchanapong (2018) attested significant increase in the speaking skill and critical thinking ability of learners under the course of Design Thinking which coincided with the results of this conducted study. The study also suggested to include the

two stated skills in EFL classrooms to facilitate language skill development.

Finally, even in the case of instruction, Design Thinking seems to have embraced by school leaders and teachers. In Kwek's (2011) study about the integration of Design Thinking in classroom learning in San Francisco Bay, teachers were not passive towards the use of Design Thinking to aid learning. When students were asked about their experience towards the ideation discussion activities conducted by instructors in RMUTL, they showed constructive comments on the attitude of instructors who facilitated the event.

This study could be used as a reference for future research which includes the topic Design Thinking and EFL learners' speaking skills and critical thinking ability. Its significance could be used to find more pertinent data that associate Design Thinking to speaking skills and critical thinking ability of EFL learners.

Limitation of the Study

Due to the small number of students who attended the 84-hour sessions of ideation discussion activities in Design Thinking course at Rajamangala University of Technology Lanna, Chiang Mai, these students were purposively used as the participants of the study. There were only eight students who joined in the activity which might not reflect the whole perceptions of the majority and even in the development of their speaking skills and critical thinking ability. In spite of this, the findings of this study are still relevant and significant to support findings in the theme related to Design Thinking vis-à-vis EFL learners' speaking skills and critical thinking ability.

Conclusion and Suggestions

After attending 84-hour ideation discussion activities in Design Thinking course, the participants seemed to have improved their speaking and critical thinking abilities as shown in their pre-test and post-test results and even in their perceptions towards the ideation discussion activities in Design Thinking course.

In summary, the pre-test and post-test scores could show that ideation discussion activities in Design Thinking had significant effects in

the participants improvement of their speaking and critical thinking abilities. This is also true to the opinions of the participants garnering a high level of agreement stating that ideation discussion activities in Design Thinking had improved their oral and speaking abilities as well as their critical thought towards a certain topic. Moreover, the test scores and opinions of the participants showed positive correlations indicating that the project intervention was effective to enhance the speaking and critical thinking abilities of the participants. Evidently, the participants strongly emphasized that ideation discussion activities in Design Thinking had helped them improved their skills. Hence, this phase in Design Thinking which is ideation with discussion activities could be a good instrument to enhance learners' speaking and critical thinking abilities.

As stated, ideation discussion activities are a good way for learners to speak and think critically towards a specified subject. However, the number of participants may be too small. It is therefore suggested to increase the number of participants in the next research to be done with similar methods and ways of doing it. It is also recommended to focus on one ability only for the next research, either speaking ability or critical thinking ability, to give more emphasis or focus to any of them. If possible, also, the next research could use any of the other three phases of Design Thinking to measure the speaking and critical thinking abilities of the participants.

Also, in the absence of control group, it is recommended for future studies to investigate and compare the significance of speaking skills and critical thinking ability between or among EFL learners who will undergo the new approach which is ideation discussion in Design Thinking and a group who will not be exposed to the mentioned new approach.

Acknowledgment

The authors would like to thank the Office of International Relations (OIR) of Rajamangala University of Technology Lanna, Chiang Mai and Singapore Polytechnic for organizing the Youth Model ASEAN Conference—YMAC 2020. Most especially, the authors would like to express their deepest gratitude towards the eight students who participated in The Ideation Discussion Activities in Design Thinking and

YMAC 2020 Programs. Without them, this research would have not put into writing.

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