The Effects of Dialogic Teaching in CLIL Science Subject on English Oral Communication Ability of Primary Students in English Program

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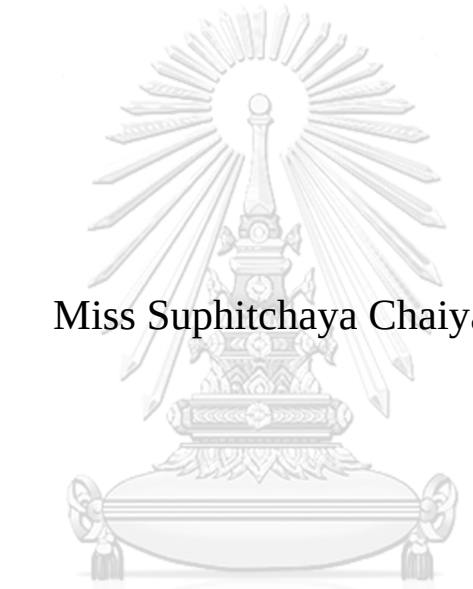

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Education in Teaching English as a Foreign Language
Department of Curriculum and Instruction
FACULTY OF EDUCATION
Chulalongkorn University
Academic Year 2021

ผลของการสอนแบบสารเสวนาในวิชาวิทยาศาสตร์ตามแนวคิดการบูรณาการเนื้อหาและภาษาต่อความสามารถในการสื่อสารด้วยวาจาเป็นภาษาอังกฤษของนักเรียนชั้นประถมศึกษาในหลักสูตรภาษาอังกฤษ

น.ส.สุพิชญา ไชยรัตนะ

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาครุศาสตรมหาบัณฑิต
สาขาวิชาการสอนภาษาอังกฤษเป็นภาษาต่างประเทศ ภาควิชาหลักสูตรและการสอน
คณะครุศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2564

Thesis Title	The Effects of Dialogic Teaching in CLIL Science Subject on English Oral Communication Ability of Primary Students in English Program
By	Miss Suphitchaya Chaiyaratana
Field of Study	Teaching English as a Foreign Language
Thesis Advisor	Assistant Professor Maneerat Ekkayokkaya, Ph.D.

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สุพิชญา ไชยรัตนะ : ผลของการสอนแบบสารเสวนาในวิชาวิทยาศาสตร์ตามแนวคิดการบูรณาการเนื้อหาและภาษาต่อความสามารถในการสื่อสารด้วยวาจาเป็นภาษาอังกฤษของนักเรียนชั้นประถมศึกษาในหลักสูตรภาษาอังกฤษ. (The Effects of Dialogic Teaching in CLIL Science Subject on English Oral Communication Ability of Primary Students in English Program) อ.ที่ปรึกษาหลัก : ผศ. ดร.มณีรัตน์ เอกโยคยะ

การศึกษาครั้งนี้มีวัตถุประสงค์ 1) เพื่อศึกษาผลของการสอนแบบสารเสวนาในวิชาวิทยาศาสตร์ตามแนวคิดการบูรณาการเนื้อหาและภาษาต่อความสามารถในการสื่อสารด้วยวาจาเป็นภาษาอังกฤษของนักเรียนชั้นประถมศึกษาในหลักสูตรภาษาอังกฤษ 2) เพื่อสำรวจความคิดเห็นของนักเรียนต่อการแบบสารเสวนาในวิชาวิทยาศาสตร์ตามแนวคิดการบูรณาการเนื้อหาและภาษา โดยกลุ่มตัวอย่างคือนักเรียนชั้นประถมศึกษาปีที่ 3 จำนวน 40 คนในหลักสูตร English program จากโรงเรียนเอกชนแห่งหนึ่ง ในจังหวัดพระนครศรีอยุธยา ประเทศไทย เข้าร่วมการทดลองเป็นระยะเวลา 11 สัปดาห์ เครื่องมือวิจัยที่ใช้ในการเก็บข้อมูล ได้แก่ 1) แบบทดสอบความสามารถในการสื่อสารด้วยวาจาเป็นภาษาอังกฤษก่อนและหลังเรียน 2) เกณฑ์การประเมินแบบแยกส่วนของความสามารถในการสื่อสารด้วยวาจาเป็นภาษาอังกฤษ และ 3) คำถามสัมภาษณ์เกี่ยวกับความคิดเห็นของนักเรียนต่อการสอนแบบสารเสวนาในวิชาวิทยาศาสตร์ตามแนวคิดการบูรณาการเนื้อหาและภาษา

ผลการศึกษาพบว่า 1) ความสามารถในการสื่อสารด้วยวาจาเป็นภาษาอังกฤษของนักเรียนหลังการทดลองเพิ่มขึ้นอย่างมีนัยสำคัญ 2) นักเรียนส่วนใหญ่มีความคิดเห็นในเชิงบวกต่อการสอนแบบสารเสวนาในวิชาวิทยาศาสตร์ตามแนวคิดการบูรณาการเนื้อหาและภาษา

สาขาวิชา	การสอนภาษาอังกฤษเป็นภาษาต่างประเทศ	ลายมือชื่อนิสิต .....
ปีการศึกษา	2564	ลายมือชื่อ อ.ที่ปรึกษาหลัก

6183390127 : MAJOR TEACHING ENGLISH AS A FOREIGN LANGUAGE
KEYWORD: Content and language integrated learning (CLIL) Science, Dialogic teaching, English oral communication ability

Suphitchaya Chaiyaratana : The Effects of Dialogic Teaching in CLIL Science Subject on English Oral Communication Ability of Primary Students in English Program. Advisor: Asst. Prof. Maneerat Ekkayokkaya, Ph.D.

This present study aimed 1) to investigate the effects of dialogic teaching in CLIL Science Subject in enhancing English oral communication ability of third grade students studying in an English program and 2) to explore the opinions of the students towards dialogic teaching in CLIL Science. This present study employed a one group pretest-posttest research design in which forty third grade students studying in an English program at a private school in Phra Nakhon Si Ayutthaya Province participated in the study for the total of 11 weeks.

The research instruments employed were 1) English oral communication ability pretest and posttest 2) English oral communication ability analytic rubric and 3) students' opinions interview questions. The results of the study indicated that 1) the students' English oral communication ability has been significantly increased after the treatment and 2) most students have positive opinions towards dialogic teaching in CLIL Science.

Field of Study:	Teaching English as a Foreign Language	Student's Signature .....
Academic Year:	2021	Advisor's Signature .....

ACKNOWLEDGEMENTS

I would like to extend my thanks to the following people who were an essential part of my thesis completion. Firstly, I would like to express my sincere gratitude to my advisor, Asst. Prof. Maneerat Ekkayokkaya, Ph.D, who has guided me throughout my research work. Without her guidance, this study would never have been completed. Her constructive advice has shaped my skills as a researcher and my thesis. I am grateful for her endless support and encouragement.

Secondly, I would like to express my sincere gratitude to my committees, Asst. Prof. Apasara Chinwonno, Ph. D., and Asst. Prof. Kittitouch Soontornwipast, Ph. D., for their times in providing valuable feedback for my work. Thirdly, I would like to express my sincere gratitude to my family who have been my rocks and my biggest supporters. I am forever grateful for them. Fourthly, I would like to express my sincere gratitude to my TEFL colleagues. Their words of encouragement had kept me going. I am grateful for our friendship.

Finally, I would like to thank myself for completing this thesis. It was a long but worthwhile journey.

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Introduction

1.1 Background of the Study

The principal goal of foreign language learning for young learners in kindergarten to primary grades is to develop their oral communication ability (Enever, 2011). This is because oral communication ability is regarded as a foundation ability developed prior to learning other skills such as reading and writing. In other words, young learners, including primary students, learn to listen and speak before they learn to read and write in a foreign language. As McKay (2006) and Butler (2016) specified, young learners using English as a Foreign Language (EFL) may have little or no oral knowledge of a foreign language. Thus, EFL programs tend to focus on having students, who are young learners, develop English oral communication ability prior to other abilities.

Oral communication encompasses the components of speaking and listening (H. D. Brown & Lee, 2015). It is an interactive process of exchanging information amongst speakers in a conversation using voice, pronunciation, vocabulary, grammar and non-verbal cues (Willbrand & Rieke, 1983). Having oral communication ability means having an ability to express, state, clarify, define and explain information (Khaled Mohsen Mohammed Zuheer, 2008). Moreover, oral communication ability enables speakers to use language appropriately in social interactions (Chantamala, 2008; Hymes, 1972; Littlewood & William, 1981; Shumin, 1997). In a classroom context, a social interaction refers to classroom interactions amongst students and teachers about learning as means to achieve the learning outcomes. Therefore, a

language for such interaction is a cognitive academic language proficiency (CALP) (Jim Cummins, 1979; Jim Cummins, 1980).

English oral communication ability plays a significant role in Thai students' second language (L2) development (Choomthong, 2014). According to the Basic Education Core Curriculum B.E. 2551 (A.D. 2008) (Ministry of Education, 2008), primary students are required to learn English as a foreign language in four areas including language for communication. Under language for communication, students are expected to use English to communicate in the written and verbal forms to exchange information, opinions, and build interpersonal relationships. Additionally, the Basic Education Core Curriculum B.E. 2551 (A.D. 2008) also provides a 'learner's quality' for grades three, six, nine, and twelve that describes the expected quality of students after completing these grade levels. For example, these qualities can be shown as students being able to engage in interpersonal communication and produce simple sentences in conversations.

Subsequently, English Program (EP) has been established in Thailand as an additional program under a bilingual education platform (Punthumasen, 2007). The aims of EP are to enhance the English proficiency of students through a language and content subjects' instructions and to enhance content knowledge of content subjects using English as a medium of instruction. In EP, English is not only the medium language of instruction, but correspondingly, it is a language of learning a content in non-language subjects including Science and Mathematics (Punthumasen, 2007). EP is a part of partial immersion bilingual education (Baker, 2011), a strong form of

bilingual education, because close to 50% of instructions are taught in English from infant through junior years of school.

These characteristics of EP allies with a Content and Language Integrated Learning (CLIL) approach. As defined by Dorothy Coyle, Hood, and Marsh (2010), CLIL is a dual-focused approach in which L2 is used as a language of instruction and a language of learning content subjects. Through CLIL, English is a channel for content learning and is acquired through various forms of in-class communication including peer and teacher's interactions on subject matters (San Isidro, 2018). Do Coyle (2007) has created a framework for the approach known as the '4Cs framework' that consisted of four interrelated elements namely: Content, Communication, Cognition and Culture. These elements shape the lesson to be content and language focused. Accordingly, EP and CLIL accentuate the importance of content learning, and language development in that content is learned through language, and language is learned through usage. In this light, English oral communication plays a critical role in EP students' academic and language developments in school.

Despite its important role, English oral communication ability is still found to be problematic for Thai students due to the lack of opportunities to use the language in meaningful ways in the classroom (Choomthong, 2014; Noom-Ura, 2013; Phothongsunan, 2018; Sawongta, 2017; Sirisrimangkorn, 2018). Additionally, the preliminary observation in primary EP classrooms found that foreign teachers often put less emphasis on the development of English oral communication ability, particularly in content subjects. For instance, there is a lack of opportunities for students to use English to orally communicate about their learning in the classroom.

In addition, most classroom conversations limit students to fact recalling as they appear as initiate-respond-feedback (IRF) sequences (Evnitskaya, 2018; Sinclair & Coulthard, 1975). As a result, students' critical thinking skills are not being challenged or enhanced.

As aforementioned, English oral communication ability is a necessary ability for students to develop; however, data from previous studies and preliminary observations indicate that students' opportunities to use English oral communication in the classroom for L2 development and for learning purposes is still scarce. Therefore, it is essential for classroom instructions to emphasize on the importance of interactions within classroom settings, to construct learning and emphasize the significance of students being active participants of learning (H Douglas Brown, 2014). That is, teachers provide students with adequate opportunities to use English in meaningful and productive ways via social interactions in the classroom in order to develop their L2 and academic learning (Lev S Vygotsky, 1978; Lev Semenovich Vygotsky, 1980).

Dialogic teaching has become an approach of interest in the field of education as it is not only promoting the 21st century learning skills such as communication, collaboration, and critical thinking skills, but also students' voice in the learning process in the classroom. As proposed by Robin Alexander (2010); Robin Alexander (2018), dialogic teaching is an approach with an aim to encourage students-centered instruction by providing supportive and joint interactional spaces in the classroom for students and teachers to critically exchange ideas and information to co-construct knowledge as a part of a learning process. In other words, this approach fosters

meaningful and cognitive demand interactions amongst students and teachers for the purpose of learning.

Dialogic teaching consists of five key principles that shape students and teachers' interactions. These five key principles are collective, reciprocal, supportive, cumulative and purposeful (Robin Alexander, 2010; Robin Alexander, 2018). Moreover, in dialogic teaching, the students' role is highly emphasized while the teacher's role is to be a facilitator who scaffolds students using guided questions and prompts (R. J. Alexander, 2001; Muhonen, Rasku-Puttonen, Pakarinen, Poikkeus, & Lerkkanen, 2016; Reznitskaya et al., 2009). Dialogic teaching can be teacher-led or student-led depending on various factors such as learning contexts and students' language proficiencies (Muhonen et al., 2016).

Several previous studies on dialogic teaching have been carried out in first language (L1) learning context to enhance oral competence, classroom's dialogue and participation, reading and writing abilities (Bignell, 2019; Gupta & Lee, 2015; Hardman, 2019; Murphy et al., 2018; Papen, 2020; Rojas-Drummond et al., 2017; Van der Veen, De Mey, Van Kruistum, & Van Oers, 2017; Van der Wilt, Bouwer, & Van der Veen, 2021). Likewise, there are previous studies in the English as a second language (ESL) learning context and English as a foreign language (EFL) learning context on dialogic teaching in enhancing English classrooms' dialogue and participation, vocabulary knowledge, reading, and writing abilities (Ang, Kian, & Yun, 2019; Chow, Hui, Li, & Dong, 2021; Lee, 2016; Muhonen, Pakarinen, Lerkkanen, Barza, & Von Suchodoletz, 2018; Shea, 2019; Yin, Yang, & Li, 2020). However, there is a lack of study of dialogic teaching in enhancing English oral communication ability of young learners in CLIL context.

A dialogic teaching could be implemented in a CLIL Science subject. The reasons being that CLIL Science subject requires students to use English to orally communicate in making inquiries and express reasoning to arrive at a scientific knowledge, and that a dialogic teaching emphasizes the co-construction of knowledge through oral interactions in the classroom. In other words, by implementing this approach in CLIL Science subject, students would be provided with opportunities to use English through cognitively demanding oral interactions for the content learning purpose. Hence, dialogic teaching in CLIL Science subject could lead to the enhancement of English oral communication ability of the students in English program.

In addressing the importance of English oral communication ability for EP students and the gap from previous studies, this study was conducted to investigate the effects of a dialogic teaching in CLIL Science subject on the English oral communication ability of primary students in English Program at private school in Phra Nakorn Sri Ayutthaya, Thailand.

1.2 Research questions

1. To what extent can dialogic teaching in CLIL Science subject enhance English oral communication ability of third grade students of English program?
2. What are the opinions of third grade students of English program towards dialogic teaching in a CLIL Science subject?

1.3 Research objectives

1. To investigate the effects of dialogic teaching in CLIL Science in English oral communication ability of third grade students of English program.

2. To explore the opinions of third grade students of English program towards dialogic teaching in CLIL Science subject.

1.4 Definitions of terms

1. **Dialogic teaching** refers to an approach, with five key principles, that aims to encourage students-centered instruction through providing supportive and joint interactional spaces in the classroom for students and teachers to critically exchange ideas and information to co-construct knowledge (Robin Alexander, 2010; Robin Alexander, 2018). In this study, the dialogic teaching was implemented in a CLIL Science subject in third grade classrooms of English program. The five key principles namely: collective, reciprocal, supportive, cumulative, and purposeful shaped interactions between students and the teacher to be dialogic; hence, allowed students to achieve CLIL learning outcomes and English oral communication ability.
2. **Content and Language Integrated Learning (CLIL)** refers to a dual-focused approach in which a second language (L2) is used as a language of instruction and a language of learning content subjects (Dorothy Coyle et al., 2010). CLIL is shaped by a framework known as a 4Cs framework, which consisted of content, communication, cognition, and culture (Do Coyle, 2007). In this study, CLIL science was an approach implemented in a science subject of English program. Hence, the emphasize of CLIL Science subject was on science content and English. Moreover, elements from a 4Cs framework were the learning outcomes of a CLIL Science subject. This means that students in CLIL Science were to achieve content, cognition, communication, and culture learning outcomes.

3. **CLIL Science subject** refers to a subject in which English is a medium of instruction in teaching science content. In this study, CLIL Science subject covered two topics namely: Life Science and Physical Science.
4. **English oral communication ability** refers to an ability to express, state, clarify, define and explain information (Khaled Mohsen Mohammed Zuheer, 2008). In this study, students used English oral communication ability to express, state, clarify, define, and explain CLIL Science knowledge. Hence, content knowledge in CLIL Science subject, fluency, vocabulary, and grammar were the four aspects of investigation from the TOEFL Junior Speaking Scoring Guide (Educational Testing Service, 2018).
5. **English program (EP)** refers to a program established by Thailand's Ministry of Education that uses English as a medium of instruction to teach various subjects including English, science and mathematics (Prasongporn, 2009). In this study, dialogic teaching in CLIL Science subject will be implemented in third grade classrooms of English program.
6. **Third grade students** refer to primary students ages between 8-9 years old. In this study, third grade students were the participants who enrolled in English program at a private school in Ayutthaya, Thailand.

1.5 Scope of the study

1. The population

The population of this study were primary students of English Program at private schools in Phra Nakhon Si Ayutthaya province, Thailand.

2. The variables

The independent variable was the dialogic teaching in CLIL Science subject. The dependent variable was English oral communication ability of third grade students of English program.

3. The Content

The study was conducted in a third grade CLIL Science subject of English program.

1.6 Significance of the study

The present study aimed to investigate the effects of dialogic teaching in CLIL Science in enhancing English oral communication ability of third grade students of English program and the opinions of third grade students toward dialogic teaching in CLIL Science.

The finding of this study can contribute to the practices of teachers of English program and other bilingual education programs that use English as a language of instruction in teaching content subjects. Specifically, the finding indicate that dialogic teaching in CLIL Science can enhance English oral communication ability of primary students. Thus, the teachers can adopt the implementation of the instruction to improve English oral communication ability of students. Moreover, teachers can also implement dialogic teaching instruction presented in the study to other CLIL or content-based subjects as well.

Moreover, the findings shed light on students' opinion towards the practice of dialogic teaching, which enable teachers to understand the impact of the instruction on students' learning experiences. Thus, allows teachers to make appropriate adjustments in their own dialogic teaching instruction.

Chapter 2

Literature Review

This chapter reviews the six essential elements related to this research including dialogic teaching, content and language integrated learning (CLIL), bilingual education, second language acquisition (SLA), oral communication ability, and research framework respectively. The details of the literature review are presented as follows:

2.1 Dialogic Teaching

Dialogic teaching has become an approach of interest in the field of education as it promotes not only the 21st century learning skills such as communication, collaboration and critical thinking skills, but also learners' voice in the classroom. As suggested by Robin Alexander (2010), dialogic teaching is an approach with an aim to encourage students-center instruction through providing supportive interactional space for students and teachers to share and exchange ideas and information to co-construct knowledge as a part of a learning process. In other words, this approach fosters meaningful classroom interactions amongst students by encouraging students to exchanging thoughts, ideas, and questions as well as considering, agreeing, and disagreeing differences views. In dialogic teaching, students and teachers are to work in collaboration and receive equal opportunity to share their voices in learning. Additionally, dialogic teaching requires teachers to decide the appropriate talks to best support students' learning and developments. Therefore, teachers' role is to be facilitators throughout the learning process by providing scaffolding strategies as ways to support students' interactions for their learning (Reznitskaya et al., 2009).

Classroom interactions in dialogic teaching lessons are different than other types of classroom interactions including rote, recitation, and instruction. According to Robin Alexander (2010), for classroom interactions to be true dialogic interactions, they are to reflect on the five key principles of dialogic teaching as follow: collective, reciprocal, supportive, cumulative and purposeful. These principles encourage students and teachers to be active participants in a learning process as they require involvement from both stakeholders to co-constructing knowledge through interactions that are supportive and meaningful in the learning process. Dialogic interactions fosters students and teachers to negotiate for meanings, think critically and scaffold effectively (R. J. Alexander, 2008). In addition, dialogic interactions also aim for critical and meaningful interactions amongst participants to enhance learning with clear goals in mind.

Moreover, as suggested by Muhonen et al. (2016), dialogic interactions in dialogic teaching lessons can be teacher-led or students-led interactions depending on various factors such as learning contexts and students' language proficiencies. EFL primary levels may benefit more from teacher-led dialogic interaction as in high quality teacher-led dialogic interactions, teachers initiate the dialogue by posing few open-ended questions to raise curiosity from students. Then, teachers become facilitators who scaffold students through a process of dialogically interacting for learning. Student-led interactions, on the other hands, highlights on students' initiations of the dialogic and teachers' roles facilitators are less active.

In this study, dialogic teaching was an approach of teaching CLIL Science subject in third grade classrooms of the English program. Additionally, this approach was implemented in a CLIL Science subject to support the nature of the subject that

necessitates inquires, reasonings or evaluations from students to arrive at comprehension. In other words, a process of science learning in EP for EFL primary students requires usages of English through meaningful and supportive in-class interactions that can lead to learning and English oral communication development. Thus, by implementing the approach in CLIL Science subject, EFL primary students were encouraged to use English by orally communicate with peers and the teacher to co-construct knowledge.

Theories of dialogic teaching

The notion of encouraging learners to participate in the dialogic interaction is influenced by theories of Mikhail Mikhaĭlovich Bakhtin (2010) and Lev Semenovich Vygotsky (1980) respectively. Theory of dialogism by Mikhail Mikhaĭlovich Bakhtin (2010) believed that dialogic speeches in the classroom can impact learners' cognitive process because these dialogic speeches provide learners with opportunities to not only interact with other speakers but also to be active participants who construct meanings and challenge ideas stated by other speakers in the dialogue. Theory of learning by Lev Semenovich Vygotsky (1980) believed that social interactions plays a vital role in learners' learning development, both in cognition and language. For instance, learners' participations in authentic communications with peers and their teacher during the class's dialogic interaction can enhance learners' thinking and reasoning as well as and language skills development. Moreover, Palincsar (1998) and Teo (2019) viewed learning to be achieved when learners' voices are being heard and expressed and when teachers take their roles of facilitators during the dialogic interaction. Through dialogic interactions, learners create the space for learning and language development from interacting with their teachers and peers.

Dialogic teaching framework

Dialogic teaching has a framework that shape the operation of dialogic teaching and is consisted of four main components namely: justifications, principles, repertoires, and indicators (Robin Alexander, 2018). The justifications provide springboard to the operation of dialogic teaching, while the repertoires are the heart of the operation that are steered by the principles and indicators.

Justifications of dialogic teaching

Justifications refer to the rationales of talks considered by the teachers. The justifications of talk include communicative, social, cultural, political, and civic, psychological, neuroscientific, and pedagogical.

Principles of dialogic teaching

An effective dialogic teaching is achieved when the following key principles are presented as they shape dialogic interactions between students and teachers and amongst students (Robin Alexander, 2010; Robin Alexander, 2018). The five key principles are as follow:

1. Collective

Collective in a dialogic teaching lesson occurs when students and teachers work together to achieve learning outcomes. That is, students and teachers receive equal opportunities to take parts as active participants in the learning process, rather than teachers being the dominant of the leaning process. For instance, the dialogic interactions are collective when participants in the interactions are given space to enquire, agree, disagree, express reasons and challenge others in respectful manners.

2. Reciprocal

Reciprocal in dialogic teaching occurs when students and teacher reciprocate each other by listening, sharing ideas, and considering alternative viewpoints. Students and teacher are reciprocal when participate in sharing and asking questions.

3. Supportive

Supportive in dialogic interaction refers to when classroom provides a supportive teaching and learning environment for both teachers and students. Supportive dialogic teaching is when students and teacher support each other in sharing ideas freely. For instance, when necessary, teachers will provide scaffolding strategies to help students elicit responses.

4. Cumulative

Cumulative in dialogic teaching refers to when students and teachers build on each other ideas to construct new knowledge. A dialogic interaction can cumulate when teachers and students become active participants in asking open-ended questions, asking for elaboration and reasons and challenging responses. Additionally, a dialogic interaction that are cumulative involves students working on critical thinking rather than students giving simple explanation or recalling information heard. This principle is found to be the hardest to endorse because it concerns with linking meanings for knowledge co-construction rather than dynamics of talks(Robin Alexander, 2018). Thus, cumulative interactions mean students and teachers working together in co-constructing new knowledge with critical thinking.

5. Purposeful

Purposeful in dialogic teaching refers to when a dialogic interaction is planned and structure with specific learning outcomes. For instance, teachers can create a

purposeful dialogic interaction with planning of open-ended questions or tasks that drive students to achieve learning outcomes of the lesson.

There is no fixed sequence as to which principle needs to be implemented firs. However, conversations between students and the teacher within dialogic teaching lessons need to reflect these principles. In this study, dialogic teaching five key principles shaped the conversation between students and the teacher to be dialogic as means to co-construct new knowledge on CLIL Science subject.

Repertoires of dialogic teaching

As aforementioned, repertoires are the heart of the operation of dialogic teaching. Repertoires include interactive settings, everyday talk, learning talk, teaching talk, questioning, and extending.

1. Repertoire 1 – Interactive settings

Interactive settings refer to various forms of interactions organization in the classroom. These settings are whole class teaching, group work, and one-to-one. Group work includes teacher-students, teacher-led, student-student and student-led. One-to-one includes teacher-student and student-student or pairs.

2. Repertoire 2 – Everyday talk

Everyday talk refers to various functions of talks that take place outside of a classroom in which students should be equipped for. Thus, teachers are accountable to expose students to these functions in the classroom. Everyday talk under this repertoire includes transactional, expository, interrogatory, exploratory, expressive, and evaluative.

3. Repertoire 3- Learning talk

Learning talk refers to talk for learning purposes that students use in the classroom, which expanded from the everyday talk above. Learning talk includes narrate, explain, speculate, imagine, explore, analyze, evaluate, question, justify, discuss, and argue. For learning from a talk to occur, students need to listen, think about what they hear, give thinking times, and respective differ viewpoints.

4. Repertoire 4- Teaching talk

Teaching talk refers to talk for teaching purposes practice by the teachers. The teaching talk includes rote, recitation, instruction, exposition, discussion and dialogue. When placing these talks on a spectrum, rote and recitation emphasis on knowledge transferring while discussion and dialogue emphasis on knowledge discovery. These range of talk on a teaching talk spectrum are effective when use appropriate. That is, discussion or dialogue alone do not necessary lead to learning. Recitation is also important as it enables teachers to explain facts and information while enable students to memorize better in content subjects. Thus, as stated by Nystrand, Gamoran, Kachur, and Prendergast (1997), a classroom interaction that leads to learning is one that requires students to think rather than reports someone else's thinking.

5. Repertoire 5- Questioning

Questioning refers to characteristics of questionings in dialogic teaching. Specifically, these characteristics are question' types, response cue, participation cue, amount of wait time, feedback types, purpose of questions, and structure of questions.

6. Repertoire 6- Extending

Extending (Michaels & O'Connor, 2012) refers to moves practiced by the teachers to elicit students' responses in the interactions. These extending moves are

providing thinking time, asking for elaborations, re-voicing, rephrasing, asking for evidence of reasoning, challenging, agreeing, disagreeing, adding on and explaining.

Indicators

Indicators describe the nature of dialogic teaching. There are sixty-one indicators that describe how dialogic teaching should go about. Though a dialogic framework provides a concise description of how talks in dialogic teaching look and sound. These indicators are interactions that encourage thinking, questions that foster critical thinking, answers that are justified, followed up and built upon, feedback that lead to forward thinking , contributions that are extended, exchanges that are linked together for knowledge co-construction , discussion and argumentation that are probed and challenged, scaffolding that provides linguistic or conceptual supports to arrive at new knowledge, professional master of subject matter that is sufficient for classroom talks and time, space, organization and relationship that are well-organized to make these above indicators possible.

In this study, dialogic teaching is used in a third-grade science subject in the English program to encourage students and the teacher's dialogic interactions in order to achieve learning outcomes. The dialogic teaching framework will shape the dialogic teaching CLIL Science lessons.

Dialogic teaching in young learners

Dialogic teaching helps young learners establish their voices in a supportive environment. Having a voice in the classroom is important for young learners' learning experiences and more importantly, for their language and learning developments. According to Hännikäinen and Rasku-Puttonen (2010), one way to create supportive interactional environment to help elicit responses from young

learners is through being a good listener. In addition to that, scaffolding strategies are also helpful in enhancing participations of young learners. R. J. Alexander (2001) and Muhonen et al. (2016) presented a term “scaffolded dialogue” as a way to guide students using guided questions, prompts, joint activities that are implemented during the dialogic interaction to assist young learners in not only participate in the interaction but also arrive at the comprehension.

In this study, dialogic teaching was implemented in a third-grade science subject in the English program to encourage students and the teacher’s dialogic interactions to achieve learning outcomes. Throughout the learning process, students were scaffolded and prompted, so that they were able to interact with peers and teachers effectively.

Dialogic teaching in language developments

In dialogic teaching, language plays a significant role in that it is used as a tool for students and teacher to communicate for and about learning. Under this approach, students receive opportunities to exercise English oral communication ability from being active participants in co-construct learning with peers and teachers in dialogic interactions (R. J. Alexander, 2008; Fisher, 2007; Kazepides, 2012; Teo, 2019)

There have been previous studies investigating the effectiveness of dialogic teaching in enhancing language development in various communicative abilities and in vocabulary knowledge of both L1 and L2 learning contexts.

In L1 context, dialogic teaching enabled students in primary levels with opportunities to use English for oral communication in completing tasks in content subjects (Gupta & Lee, 2015). This approach also showed to provide sixth grade Mexican students with opportunities to talk amongst themselves about reading texts,

which led to co-construct of meanings about texts. This enhanced reading comprehension and the quality of writing (Rojas-Drummond et al., 2017). Similarly, dialogic teaching helped enhance reading comprehension of fourth grade students in the United States as teacher and students work together in discussing about the texts in small group (Murphy et al., 2018).

As for improving classroom dialogues, dialogic teaching allowed teachers to evaluate their practices for effective dialogic teaching lessons (Bignell, 2019). Dialogic also improved students' attainment in various content subjects and teacher' practices (Hardman, 2019). The practices of dialogic teaching also enhanced students' critical visual literacy (Papen, 2020). Moreover, dialogic teaching reported to enhance students' oral competences given sufficient language usages (Van der Veen et al., 2017; Van der Wilt et al., 2021).

In L2 contexts, likewise, there are some previous studies in EFL learning contexts on dialogic teaching in enhancing English classrooms' dialogues, reading, and writing abilities. Dialogic teaching increased students' voices in discussing literacy in ninth grade English classroom in Singapore, which resulted in literacy skills development as well as participation in literacy discussions (Lee, 2016). The practices of dialogic teaching in Finland enhance students' participations more than in United Arab Emirates due to different contexts of instruction (Muhonen et al., 2018). In Japan learning context, dialogic teaching showed to improve engagement of students in taking parts in talks when implemented accordingly (Shea, 2019). As for in Singapore, third grade primary students showed that dialogic teaching also enhanced inferential skills in reading found in their written and verbal responses (Ang et al., 2019). Dialogic teaching would only be effective when constructivism is

emphasized (Yin et al., 2020). Furthermore, dialogic teaching could lead to improvement of vocabulary knowledge, expressive rather than receptive, due to meaningful and in context usages during the dialogic talks (Chow et al., 2021).

These above studies have indicated that through dialogic teaching, students were provided with opportunities to use English as a mean for communication for learning. Dialogic teaching needs to be implemented accordingly to bring out participations, engagements and effective classroom dialogues.

In this study, dialogic teaching was implemented in CLIL Science subject of English program. Students were encouraged, by the teacher, to take parts as active participants in dialogic interactions to share outputs critically as a mean to construct new knowledge. With sufficient opportunities to use English for oral communication in dialogic interactions, students' English oral communication ability could improve.

2.2 Content and Language Integrated Learning (CLIL)

Content and language Integrated Learning (CLIL) is an umbrella term used by the European Network of Administrators, Researchers and Practitioners (EUROCLIC) to refer to classroom activities in which a foreign language is used as a tool for learning a non-language subject (Do Coyle, 2007). From this, students participate in a CLIL activity that involved the communication in a foreign language to learn a non-language subject. Unlike other types of programs and approaches under bilingual education that may focus on either a content or a language, CLIL focuses on the integration of both content and language (Do Coyle, 2007). As stated by Marsh (2002), content and language are viewed as one rather than two separate aspects of teaching and learning. In other words, they are treated equally. To put simply, CLIL is a dual-focused approach in which L2 is used as a language of instruction and a

language of learning content subjects (Dorothy Coyle et al., 2010). From these definitions, students in CLIL are not only acquired content knowledge from non-language subjects but also developed foreign or L2 skills. As San Isidro (2018) stated, students in CLIL acquire a foreign or L2 skills through authentic usages of the language in various forms of communication. This means, language is learned incidentally through usages of language in forms of communication including discussions, presentations, debate, dialogue talks, and other communicative activities.

CLIL comes with flexibility in term of its implementations in various learning contexts from language showers to double immersion program (Mehisto, Marsh, & Frigols, 2008). From this, CLIL is categorize in differ types and models based on its implementation in a context. For instance, Massler, Stotz, and Queisser (2014) categorized CLIL into type A and type B. Type A CLIL focuses on teaching content in content classes while type B CLIL focuses on teaching content in language classes. Clegg (2003) as cited in Do Coyle (2007) put CLIL into a language-led CLIL or soft-CLIL, which highlights on language development while teaching the content and a subject-led CLIL or hard-CLIL, which highlights less explicitly on language development while teaching the content.

In this study, CLIL was an approach in a science subject. Thus, the instruction and learning emphasized on content and language developments. CLIL Science in the study was also a hard-CLIL Science meaning content instruction was more explicit than the language instruction. In other words, language learning was a result of content learning.

Content and language integrated learning (CLIL) framework

To support the teaching and learning of CLIL in all educational contexts, the 4Cs Framework was developed (Do Coyle, 2007). This framework is consisted of four interrelated elements namely: Content, Communication, Cognition and Culture. Content refers to knowledge, skills and understanding of subject content. It is a 'what' and a 'how' of content learning. Communication refers to a second or a foreign language use in learning and express. There are three main language objectives in CLIL namely: Language of, for and through learning (Do Coyle, 2007).

In language of learning, learners use this language to access concepts of a content subject. For instance, a set of vocabulary under a unit on relationships of living things is words that learners need to know before they can use them. In language for learning, it is a language needed for learners to operate in a CLIL lesson. Students acquired language of learning then language for learning. For instance, students need to know when to use different statements to describe relationships of living things with the teacher and peers. As for language through learning, it is language skills that students acquire through the learning process. It is also viewed as the byproduct of learning in CLIL. For instance, students may gain not only vocabulary knowledge but also sentence structure knowledge at the end of the lesson. As for cognition, it refers to thinking process and cognition engagement of students. Finally, culture refers to classroom culture that involves how students learn about, from and with others as well as appreciate, respect and manners in collaborations.

In this study, the four components of CLIL existed within a dialogic teaching CLIL science subject. For instance, Content was the CLIL science content which corresponded to the revised version of Basic Education Core Curriculum B.E. 2560

(A.D. 2017). As for cognition, students were encouraged to use high-level thinking skills to complete tasks and to inquire information. For culture, students were exposed to culture differences under each learning topic to make them develop cultural awareness. Lastly, for communication, students used English as means of communication with peers and the teacher to achieve the language of, for and through learning.

Content and language integrated learning (CLIL) for primary students

As suggested by Mehisto et al. (2008), CLIL is beneficial for primary students due to that it enhances not only non-language subjects content knowledge but also social and language skills. The approach supports a holistic development and interdisciplinary learning, which enables students to exercise social skills through collaborations using a second or foreign language to communicate with a teacher and peers and cognitive skills through higher level thinking and higher level of engagement in CLIL lessons. Moreover, CLIL for primary students focuses on content and meaning rather than form. Additionally, a second or foreign language in CLIL is acquire similarly to students' first language acquisition. That is, learners find second or foreign language acquisition to be natural and effortless as they learn to use the language the same time use the language to learn. Moreover, content in CLIL lessons are not pre-taught in students' first language. As presented by Mehisto et al. (2008), there are five core features of CLIL that reflect in CLIL lessons. These are multiple focus, safe and enriched learning environment, authenticity, active learning, and scaffolding.

Additionally, despite various benefits of the approach, CLIL carries some challenges too (Mehisto et al., 2008). For instance, many assumed that learning

through CLIL may cause students to fall behind because they don't learn content subjects in their first language and that CLIL is only suitable for advance students. Another challenge from CLIL is a shortage of CLIL teachers. This is because CLIL requires teachers to be proficient in not only a content but also a language. Workloads and materials also challenged effective implementation of CLIL. CLIL primary teachers do not always given with ready-made materials. Thus, they are to prepare more than non-CLIL primary teachers to ensure the accessibility and appropriateness of materials. Finally, implication of CLIL needs to be carefully planned and carry out given that to cover the 4Cs in a framework as well as other core features.

In this study, CLIL science subject was taught through dialogic teaching approach. In CLIL science subject, content on CLIL Science was emphasized heavily while language was the expected results. The four components under a 4Cs framework were made into learning outcomes of the lessons to ensure that students could develop content knowledge, cognition skills, communication ability and culture knowledge.

Content and language integrated learning (CLIL) science

As aforementioned, content and language integrated learning (CLIL) is an approach that focuses on both content and language (Do Coyle, 2007). Therefore, a CLIL science subject refers to a subject of science that use English as a language of instruction and learning. Under a CLIL science lesson, content, communication, cognition and culture in a 4Cs framework(Do Coyle, 2007) play an essential role in shaping a lesson to foster learning of content and language. Thus, a CLIL science lesson need to have objectives of these four elements. For instance, content in a CLIL science subject refers to a science concepts, and knowledge from a learning outcome

of a lesson. Communication refers to an academic language that students need to have to achieve a learning outcome of a lesson. This can be science terminology and phrases introduce by teachers for learning purposes. As for culture in CLIL science subject, it can be classroom cultures related to science. Finally, cognition that refers to skills such as classified, compared and apply that students need to achieve as it is part of the learning outcome of a lesson.

CLIL science is applicable for primary students when provides comprehensible input, space for interactions and scaffolding (Gabillon, 2013). Language for science should also be presented and taught explicitly rather than having students discover it through interactions (Nikula, 2015). Lastly, CLIL science showed to improve primary students' vocabulary size, science knowledge and perceptions in learning content subjects in English (Huang, 2020).

Revised version of Basic Education Core Curriculum B.E. 2560 (A.D. 2017)

The Office of Basic Education Commission (OBEC) under Thailand' Ministry of Education has revised the science subjects' standards and indicators in the Basic Education Core Curriculum B.E. 2551 (A.D. 2008) for the purpose of facilitating and enhancing the learning of students in science subject in the 21st century. Specifically, the revised version of the core curriculum in science subject encourages students to make scientific inquiries as parts of science learning process.

Contents that were taught in CLIL science subject were correspond to the standard and indicators of primary three science subject stated in the revised version of Basic Education Core Curriculum B.E. 2560 (A.D. 2017) as illustrated below in Table 1,

Table 1 Learning standards and indicators of primary three science subject

Learning standard	**Indicator and core content**	**Unit**
Standard SC 1.2	Strand 1: life science Describe necessities for humans and animals to leave and grow from collected data Realize the importance of food water and air by taking good care of ourselves and animals Make a model to describe the lifecycles of animals and to compare the lifecycles of some animals Realize the value of animal lives by not do anything that effects their life cycles	1
Standard SC 2.1	Strand 2: physical science Explain that an object is made up of different parts which can be deconstructed	2

Learning standard	Indicator and core content	Unit
	and reconstructed into a new object based on empirical evidence. Explain how material change when heated or cool based on empirical evidence	
Standard SC 2.2	Identifying the result of forces that change the motion of an object based on empirical evidence Compare and give examples of contact and noncontact forces that change the motion of an object based on empirical evidence Classify objects by their property of magnetic attractions based on empirical evidence	3

Learning standard	Indicator and core content	Unit
	Identify magnetic poles and predict what will happen when two different poles are placed closely based on empirical evidence	

2.3 Bilingual Education

Bilingual education refers to an education with an aim to promote bilingual and multilingual competence using two or more languages as medium of instructions for a majority portions of the school curriculum(Genesee, 2004). On the other hands, Rossell and Baker (1996), described bilingual education as teaching writing, reading and content subjects in students' native language then gradually change the language of instruction to English, which is not their native language. Additionally, Genesee (2004) also proposed that bilingual education an integration of a language and an academic instruction and thus, students' mastery of language is as important as students' mastery of academic.

Although definitions of bilingual education may be slightly different, Genesee (2004) stated that bilingual education across countries share the same goal in term of producing bilingual and multilingual students with appropriate first language (L1) development and academic achievement. Though, he also pointed out that not all bilingual education across the countries shares the same L2 goal. For example, L2

goal or a linguistic goal of an English immersion program, under an umbrella of bilingual education, in Japan is differ from French immersion program in Canada (Genesee, 2004).

Baker (2011) proposed three forms of bilingual education that are considered ‘ weak forms’ of bilingual education and proposed four forms of bilingual education that are considered ‘strong forms’ of bilingual education. The ‘weak forms’ are namely: transition bilingual education, mainstream with foreign language teaching bilingual education, and separatist bilingual education. These are weak forms of bilingual education because they result in producing monolingual or limited bilingual students. On the other hand, ‘Strong forms’ of bilingual education, is considered strong forms because they result in producing bilingual, biliteracy, and bicultural students. They are a dual/two ways language education, a heritage/ maintenance language bilingual education, an immersion bilingual education and a mainstream bilingual education.

Bilingual Education in Thailand

Punthumasen (2007) suggested that as a member of the ASEAN community, the demand for English in Thailand has continued to increase. This is because English is an international language in that it has become a language use as a medium of communication between people within the ASEAN community and around the world. Thus, for many years, the Ministry of Education has worked on and put in place projects and policies to improve the teaching and learning of English language.

In the basic education levels, the Ministry of Education has allowed international schools to be operated in 1957. This type of school doesn’t follow the Basic Education Core Curriculum and English is the only language of instruction

taught by native English speakers (NES) teachers and qualified non-native English speakers (NNES) teachers in every subject. Then, in the year 1995, the Ministry of Education had announced English as the first foreign language to be taught in school.

In the following year, the English curriculum was first implemented at grade 1. Today, most of the schools start teaching English at the kindergarten levels. In the same year as the announcement of the first foreign language to be taught in school, the office of the Basic Education Commission (OBEC) had also begun to launch the E.P. schools to qualified schools across the country. This type of school also uses English as a medium of instruction but only for core subjects. The core subjects in the E.P. schools are taught by NES and qualified NNES teachers just like in the international schools. As for the higher education levels, in the past two decades, the Ministry of Education has allowed international programs to be operated in universities and other high education institutes

English Program (EP)

EP schools are referred to schools that has the English program operates from kindergarten to secondary levels (Prasongporn, 2009). In the kindergarten levels, the English instruction time cannot exceed 50% of the class time. In another word, teachers who teach in the English program of the kindergarten levels are to speak in two languages: English and Thai. As for the elementary and secondary levels, English is the only language of instruction. In another word, teachers who teach in the English program of these levels are to speak English for the entire teaching time. In addition, in such program, at least 4 core subjects are taught in English for at least 15 hours per week. Based on Baker (2011), English program is considered to be a strong form of bilingual education, specifically a partial immersion bilingual education because close

to 50% of instructions are taught in English from infant through junior years of school.

The English program has the following key features (Prasongporn, 2009) as follows:

1. The English program is optional, and schools can opt in according to their readiness and capability
2. The program can be implemented from early childhood to secondary level
3. The teaching and learning process of the program will take account of the Thai context but at the same time it will exemplify international elements. It aims to maintain the prosperity of the nation, religion, monarchy, the Thai language, art and culture.
4. The administration and management of teaching and learning through English must benefit from conventional resourcing in terms of materials, laboratories and so on.

To conclude, the aim of English Program under Thailand's bilingual education platform is to enhance students' proficiency of English in all skills through content and language instructions. Thus, it aims to foster bilingual and biliteracy students.

In this study, English program was a context of learning and teaching of third-grade primary students. Specifically, English was a language of instruction for CLIL science subject.

2.4 Second language acquisition (SLA)

Second language acquisition (SLA), as defined by Susan M Gass (2013), is a process of learning a second/another language after students' first language. A second/ another language can be students' second, third or fourth language and it can be acquired in school or out of school contexts. VanPatten and Benati (2015) referred SLA as a study of what is learned in a L2, what is not learned in a L2 and how

students create a new language system. Under SLA, there are approximately forty different SLA theories (Larsen-Freeman & Long, 1991) in which they put into a continuum from those that are involved innate capabilities and endowments to those that put nature and experience over innate endowment.

Krashen's Monitor theory

Krashen's monitor theory is one of the theories that belong to the nativist view. According to this view, students have innate ability to acquire L2 through exposure as they are born with universal grammar (Larsen-Freeman & Long, 1991). In other words, according to this view, students are born with an ability to learn a language. Krashen's monitor theory is consisted of five basic hypotheses namely: acquisition learning hypothesis, natural order hypothesis, monitor hypothesis, input hypothesis and effective filter hypothesis (Krashen, 1981, 1985; Krashen & Terrell, 1983).

Input hypothesis

According to the Input hypothesis, students acquire a language by understanding messages (input) that is one level beyond their stage of linguistic competence (Krashen, 1985). The input that is one level beyond students' linguistic competence is represented as 'i+1' in which i represents input and +1 represent one level up. When students received i+1 level of input, they receive 'comprehensible input' that allows for language acquisition to take place. Thus, comprehensible input is an important factor for L2 acquisition as with adequate comprehensible input, students will develop grammar structures without formal instruction (Krashen, 1985).

There are some criticisms about input hypothesis. First, it was criticized for its vagueness of 'comprehensible input'. McLaughlin (1987) claimed that Krashen's

definition of ‘comprehensible input’ was never precise. Thus, comprehensible input and i+1 formula is left with vagueness. Second, it was criticized for its notion of the simplification of input. One of Krashen (1985)’ statement was that input can be made comprehensible by simplifying it. For instance, he claimed that speech of a caretaker is an example of comprehensible input as it is typically simplified, hence, is comprehensible input. This statement was rejected by White (1987) and Gregg (1984) as they claimed simplification does not make comprehensible. Third, it was criticized for its overclaimed. According to Krashen (1981), input hypothesis in the most important concept of SLA and L2 can only be acquired with comprehensible input. These claims were rejected by McLaughlin (1987) and H Douglas Brown (2000) using internal and external factors. Firstly, it was argued that comprehensible is not the only cause for language acquisition for internal factors can also lead to language acquisition. Secondly, it was argued that input hypothesis alone does not lead to language acquisition as it needs other SLA theories to take parts in enhancing the process of language acquisition. These hypotheses are Interactional hypothesis (M. H. Long, 1983) and Output hypothesis (Merrill Swain, 2000). To conclude, when considering input hypothesis, it is important to consider internal and external factors (McLaughlin, 1987) as well as reflect on interactions between students and input (White, 1987).

Interaction hypothesis

As formulated by M. H. Long (1981), interaction hypothesis involves conversational interactions in language teaching and learning. Specifically, students have access to comprehensible input, outcome, and correction in the form of conversation amongst speakers. Under the interaction hypothesis, students acquire a

language by negotiating in meaning and engaging in the interaction. When students are engaged in the interaction, they pay attention to input and form. Additionally, interaction hypothesis is formulated to redefined comprehensible input and to scaffold as modified interaction (M Long, 1996; MH Long, 2007; M. H. Long, 1985). Teachers can modify inputs for students by slowing down the speech, providing comprehension checks, requesting for clarification, and paraphrasing. Moreover, under the interaction hypothesis, interaction and input play a major role in students' language acquisition (Susan M Gass, 2003). That is, interaction should be modified for the input to be comprehensible. To conclude, interaction hypothesis encourages teachers to view a classroom as a place for students to interact for language acquisition in a well-designed context of interactions.

Output hypothesis

Output hypothesis gives importance to the output as it pushes students to process language deeper and with more mental effort (Merrill Swain, 2000). According to Swain, output is students' meaningful productions, verbal and written, of language that plays as significant role in SLA as input. When students produce output, they become aware of their linguistic knowledge and forms (Merrill Swain, 2005). This awareness allows them to notice 'gaps' in their linguistic knowledge and fill in those 'gaps'. Hence, according to Ellis (1994), noticing forms of a language from producing output is essential for a language acquisition.

Output benefits students' SLA in various ways. Firstly, output moves students from semantic processing for comprehension to syntactic processing for production (Benati, Laval, & Arche, 2013; Merrill Swain, 1993). In another words, output requires students to exercise their syntactic processing by turning input into

meaningful language productions in forms of verbal or written output. Secondly, output enables students to notice their linguistic knowledge gaps and to fill in the gaps (Ellis, 1994). Thirdly, output enables students to test their language hypothesis (Benati et al., 2013; Merrill Swain, 2005) by producing output and reeving feedback to test their hypothesis. Fourthly, output impact students' cognitive processes in language production by requiring students to turn input that becomes language knowledge into procedural knowledge (Benati et al., 2013; De Bot, 1996). That is, output provides students with opportunities to use language knowledge in actions in output. Lastly, output activates more input and thus, lead to SLA.

Social constructivism

Social constructivism, under constructivism school of thought, accentuates the importance of social interactions and cooperative learning (H Douglas Brown, 2014). That is, in the view of SLA, social constructivism enables students to acquire a language through interactions for social and learning purposes. Thus, for SLA and learning to be effective, social interactions, discovery learning, and students' active role are key ingredients.

Social constructivism was influenced by (Lev S Vygotsky, 1978; Lev Semenovich Vygotsky, 1980) who claimed that social interactions lead to students' cognitive and language developments. Vygotsky had also claimed that zone of proximal development (ZPD) plays an essential role in social constructivism. The ZPD refers to a zone between students' current knowledge and ability and students' potential knowledge and ability(Lev S Vygotsky, 1978). Within ZPD, students received supports from teachers and higher ability friends to complete tasks. Hence, social interactions and cooperative learning for L2 development also take place within

ZPD. Social constructivism is closely related to Mikhail M Bakhtin, Emerson, and Holquist (1986); Mikhail Mikhaĭlovich Bakhtin, Holquist, and Liapunov (1990)'notion that language is found in social and cultural interactions, which is also a tool for communication.

2.5 Oral communication ability

Oral communication ability involves speaking and listening (H. D. Brown & Lee, 2015). It is an interactive process of exchanging information through the use of voice, articulation, vocabulary, syntax and non-verbal cues between two or more persons (Willbrand & Rieke, 1983). In other words, as defined by Rahman (2010), oral communication ability is an interaction between two or more persons in exchanging information, thoughts, feelings, ideas and values.

Speakers are to have oral communication ability in order to participate effectively in all types of oral communication. As stated by Chantamala (2008); Hymes (1972); Littlewood and William (1981); Shumin (1997), oral communication is an ability to use language appropriately in social interactions. Additionally, Tarone (1974) regarded oral communication ability as a speaking ability involves fluency, interpersonal communication, grammar, pronunciation and sounds system including stress, intonation and rhymes between speakers. With this ability, speakers can orally express, state, clarify, define and explain information (Khaled Mohsen Mohammed Zuheer, 2008). Essentially, oral communication ability allows people to use language to orally interact in various forms of oral communication.

In this study, English oral communication ability refers to an ability to express, state, clarify, define and explain information (Khaled Mohsen Mohammed

Zuheer, 2008). Specifically, students would orally communicate amongst themselves, and the teacher as means to co-construct new knowledge in CLIL Science subject.

Components of oral communication ability

Given that oral communication ability is an interactive process, it is also a complex process that consists of various components that drive for effective speakers in oral communication. Linder (1977) proposed five components of oral communication ability namely: fluency, comprehensibility, amount of communication, quality of communication and effort of communication. Fluency refers to as the continuation of speeches. Comprehensibility refers to as the clarity of the speeches. Amount of communication, as the name stated, is the number of speeches in the communication. Quality of communication refers to as the accuracy of speeches and effort of communication refers to as speakers' effort in making speeches comprehensible using verbal or non-verbal gestures.

Similar to Linder and Weir (1990) as cited in Chantamala (2008) also proposed four components of oral communication ability namely: fluency, appropriateness, accuracy and range. According to this set of components, the appropriate usages of language and the variety usages of language in oral communication are concerned.

Khaled Mohsen Mohammed Zuheer (2008) proposed eight components of oral communication ability namely: speech sounds and sounds patterns, stress and intonation patterns and rhymes, vocabulary, grammar, appropriateness, organization, values and judgments and lastly, fluency.

In the study, the components of English oral communication that were assessed were fluency, grammar, and vocabulary. Specifically, fluency concerned

with the continuation and fluid of speeches. Vocabulary concerned with words choices and grammar concerned with structures that impact meaning of speeches. Furthermore, since CLIL Science subject was the subject taught in the study, content knowledge on CLIL Science was also another component assessed. Thus, components assessed were content (CLIL Science), fluency, vocabulary and grammar.

Assessing Oral Communication Ability

There are many ways to assess oral communication ability. As McKay (2006) and Butler (2016) advised, the selection of communicative tasks should be based on the appropriateness and usefulness for the students. For instance, inputs such as pictures and videos are appropriate to use in oral communicative tasks for young learners. These types of inputs can foster interactions of young learners.

Thornbury (2005) proposed five types of oral communication tasks namely: interview, in-person oral presentations, recorded oral presentation, role-play, and discussion. In addition, Harmer (2007) also recommended four types of oral communication tasks. They are information-gap -filling activities, decision-making activities, images description activities and sentence repeating activities. These types of assessment can be done at any point of the lesson. Assessment can be done at the beginning of the lesson for pre-test or at the end of the lesson for post-test. In this study, English oral communication ability of primary students in English program was evaluated during the pretest and posttest stage of the data collection procedure.

The criteria of oral communication ability assessment

Oral communication ability can be assessed on various criteria depends on the objectives of oral communication tasks.

Burns (2012) also proposed criteria for assessing oral communication ability that include language, production, participation, expression, and coherence. Language refers grammar and vocabulary usages as well as structure and organization. Production refers to fluency and sounds systems. Participation refers to turn taking and maintenance of the communication. Expression refers to clarity and quality of ideas and coherence refers to connections of ideas and reasoning.

The Common European Framework of Reference (CEFR) suggested an oral assessment criteria grid to assess English oral communication ability. The criteria under the CEFR for oral communication ability include range, accuracy, fluency, interaction and coherence (Milanovic, 2009). Range refers to ability to communicate information using various linguistic forms. Accuracy refers to ability to use appropriate forms to convey meaning. Fluency refers to ability to carry on the communication. Interaction refers to ability to interact using interact using verbal and non-verbal cues and coherence refers to ability to create clear and organized speeches.

TOEFL (Test of English as a Foreign language) junior test, under an ETS (Educational testing service), also developed a TOEFL Junior Speaking Scoring Guide (Educational Testing Service, 2018) that is a holistic rubric. This scoring rubric is used to evaluate students' English oral communication ability in an academic classroom. There are three types of scoring rubrics that accommodate different speaking tasks namely: read-aloud, six-picture narration and listen-speak. Additionally, within each scoring rubric are criteria to evaluate students' English oral communication ability. These criteria are including fluency, accuracy, content, delivery and language use descriptors.

Given that participants in this study are primary students, the study adapt TOEFL Junior Speaking Scoring Guide to evaluate students' English oral communication ability in CLIL science subject of English program. Specifically, students were evaluated on their content, fluency, grammar, and vocabulary knowledge. Content referred to correctness of information from CLIL science in the speech. Fluency referred to the smoothness of the speech. Grammar referred to the correctness of grammatical structures in the speech and vocabulary refers to the appropriateness of word choices in the speech.

Functions of oral communication

Language functions give purposes to language for oral communication. G. Brown, Gillian, Brown, and Yule (1983) classified language functions into two groups namely: interactional language function and transactional language function. These two language functions have different purposes.

Interactional language function, as the name stated, is a language for social interactions. Students use interactional language when socialize with peers at school or with family members at home. This function of language is informal and aims to maintain social relationships. Hence, the attention is put towards speakers rather than information. Examples of interactional language function are such as students telling jokes, students greeting teachers and students listening to another student talking about his trip to the zoo.

As opposed to interactional language function, transactional language function focuses on the information and is used in more formal contexts such as in classroom discussions. Students use transactional language function to interact with teachers and sometimes peers in the classroom. In transactional language functions, the attention is

put towards the information rather than speakers. Some examples of transactional language function are such as students exchanging information and asking questions amongst themselves or with teachers in the classroom.

Richards (2008) later adopted these language functions and proposed three functions of oral communication namely: talk as interaction, talk as transaction, and talk as performance. These functions serve different purposes as discussed below.

Talk as interaction refers to an informal or everyday conversation that focuses on speakers and hence, aims to create social relationships. This talk includes greeting, making small talks and jokes and telling personal stories. Talk as interaction occurs in informal contexts such as at homes and at playground.

Talk as transaction refers to talks that focuses on messages and information. This type of talk is differed from talk as interaction in that it aims to give and receive information or getting goods and services. Examples of talk as transaction are such as discussing, describing, or explaining information in class, responding to questions posed by teachers or peers and making a phone call for a restaurant reservation.

Talk as performance refers to pre-prepared or pre-scripted talks that are rather monologue. This type of talk focuses on the social relationship as well as on messages being delivered. Thus, forms and accuracy are very essential. Examples of talk as performance are such as welcome speech, wedding toasts, and announcements.

In this study, the functions of language use in CLIL science subject were talk as transaction or transactional language for the purpose of learning content in CLIL science subject and exchanging information as a mean to co-constructing knowledge.

Cognitive academic language proficiency (CALP)

Cognitive academic language proficiency (CALP) refers to language necessitates for academic and formal settings, which is cognitively demanding (Jim Cummins, 1979; Jim Cummins, 1980). In another words, CALP is a language that students use in the classroom for learning. CALP can be defined as a context-reduced communication (Jim Cummins, 1981) as CALP language does not require a listener' knowledge of context to understand what a speaker is saying. Given that CALP is a language found in the classroom setting, it shows relevance to content and language integrated learning (CLIL) subjects. Specifically, in CLIL Science subject, students need to be equipped with an academic language or CALP to communicate about CLIL Science content.

Primary students

Primary students are young learners. As defined by McKay (2006) and Butler (2016), young learns are students who learn a second or foreign language during the first 6-7 years of schooling. According to McKay, young learners are categorized into three groups.

1. Entry years age: five to six years old students whose teaching is focused on the development of oral skills and literacy skills in their first and second language.
2. Lower primary age: seven to nine years old students whose teaching is focused on communication with only meaning focused.
3. Upper primary/ lower secondary age: ten to fourteen years old student whose teaching is more formal and analytical.

In this study, young learners were primary students in third grade of English Program whose age were between seven and eight. Therefore, their oral interaction were more of meaning-based interactions.

Oral Communication Ability and EFL Young Learners

Unlike native young learners, EFL young learners have little or no oral knowledge of L2 when they first enter school (Butler, 2016; McKay, 2006). As a result, EFL programs tend to focus on having young EFL learners develop oral communication (i.e., listening and speaking abilities) prior reading and writing skills. Thus, oral communication is the foundation ability. Typically, EFL young learners have limited exposure and usage of English. They mainly use the language in the classroom. Therefore, a classroom language is the only type of language they expose and use to communicate with peers and teachers.

As Cazden (1974) and Philp, Oliver, and Mackey (2008) stated, young learners frequently use English in a playful and exploratory way. That is, they use English to orally communicate during playtime and discussions with peers and teachers.

There have been recent studies conducted on enhancement of oral communication with young learners. The study by Sun et al. (2017) revealed that the use of social networking sites (SNSs) and mobile learning such as mobile assisted language learning provided first grade Chinese students with opportunities to use English for communication in meaningful and low-stress ways through interactions. From the use of such platforms, students' fluency had increased significantly. Another study by Sawongta (2017) showed that holistic approach could also enhance oral communication of sixth grade Thai students. Under this approach, students' affective

and cognitive domains were considered as part of their learning experiences. With that said, students were provided with plentiful of opportunities to communicate in meaningful and appropriate communicative tasks. In addition, they were also exposed to both direct and indirect approach of teaching. Thus, were equipped with language knowledge, metacognitive and communicative strategies to orally communicate with peers with confidence.

Besides holistic approach, a study by Nievecela and Ortega-Auquilla (2019) revealed that cooperative learning (CL) strategies could enhance seventh grade Ecuadorian students' oral communication. Specifically, students in the study were able to achieve at A1 level under the CEFR oral communication criteria that includes comprehension, interactions, fluency and pronunciation. CL strategies encourage students to participate in oral communication activities with confidence. Thus, students showed positive attitude towards using the language to interact with peers and teachers during lessons. The integration of communicative classroom activity namely: Picture Descriptions in the study by Lavalle and Briesmaster (2017) also showed to enhance eighth grade Chilean students' oral communication. Pictures helped elicit students' thinking, feelings, opinions, or beliefs without intimidating them because they were everyday objective that students were familiar with. Thus, pictures description activity fostered interactions between students, which led to development of oral communication ability.

These studies suggested that oral communication ability in young learners can be enhanced with adequate exposure and usages of English in interactions such as classroom interactions and communicative tasks. Affective and cognitive domains as

well as appropriate inputs also played important roles in the development of the ability and its components.

In this study, third grade students' English oral communication ability were evaluated as a result of dialogic teaching in CLIL Science subject implemented.

2.6 Summary of the chapter

The literature reviews in the present study elaborate on the following concepts: dialogic teaching, content and language integrated learning (CLIL), bilingual education, second language acquisition (SLA), and oral communication ability. Therefore, there are five sections of the literature review in this chapter as follows,

In the first section, dialogic teaching refers to an approach, comprised of five key principles, that encourages students-centered instruction through shared and supportive interactional space amongst the teacher and students. This space is for participants to exchange ideas and information to construct new knowledge using critical thinking. The five key principles of dialogic teaching are collective, reciprocate, supportive, cumulative, and purposeful. They shape the nature of interactions for learning purposes.

In the second section, content and language integrated learning (CLIL) refers to dual-focused approach in which L2 is used as a language of instruction and a language of learning content subjects. In CLIL, the 4Cs framework plays a significant role in shaping the learning outcomes and four components also work synchronously. Thus, under CLIL, students should be able to gain content, communication, cognition, and culture knowledge. In CLIL, the content is learned through a language and a

language in learned through a content. Hence, both content and language are treated equally.

In the third section, bilingual education refers to an education that aim to foster bilingual and multigoal competence of students. These competences are promoted using two or more languages as medium of instructions for a majority portions of the school curriculum. A ‘Strong forms’ of bilingual education refers to education programs that result in bilingual, biliteracy, and bicultural students. For instance, immersion bilingual education is considered a ‘strong form’ of bilingual education. In the bilingual education context of Thailand, English program (EP) is considered as a part of partial-immersion bilingual education program that close to 50% of instructions are taught in English. Hence, it is expected that students will become bilingual and bicultural.

In the fourth part, SLA refers to a process of learning L2 after students learned L1. There are several supported theories in SLA including input hypothesis, interactional hypothesis, and output hypothesis. According to input hypothesis, SLA takes place when students receive comprehensible input (i+1). Though, according to the interactional hypothesis, modifier of language in the interaction is also essential for students’ SLA. Most importantly, output hypothesis indicates its important role in SLA. The reason being that output hypothesis pushes students to process language deeper to produce an output that is meaningful. Output also enables students to see their linguistics gaps and fill them. This is important for L2 development.

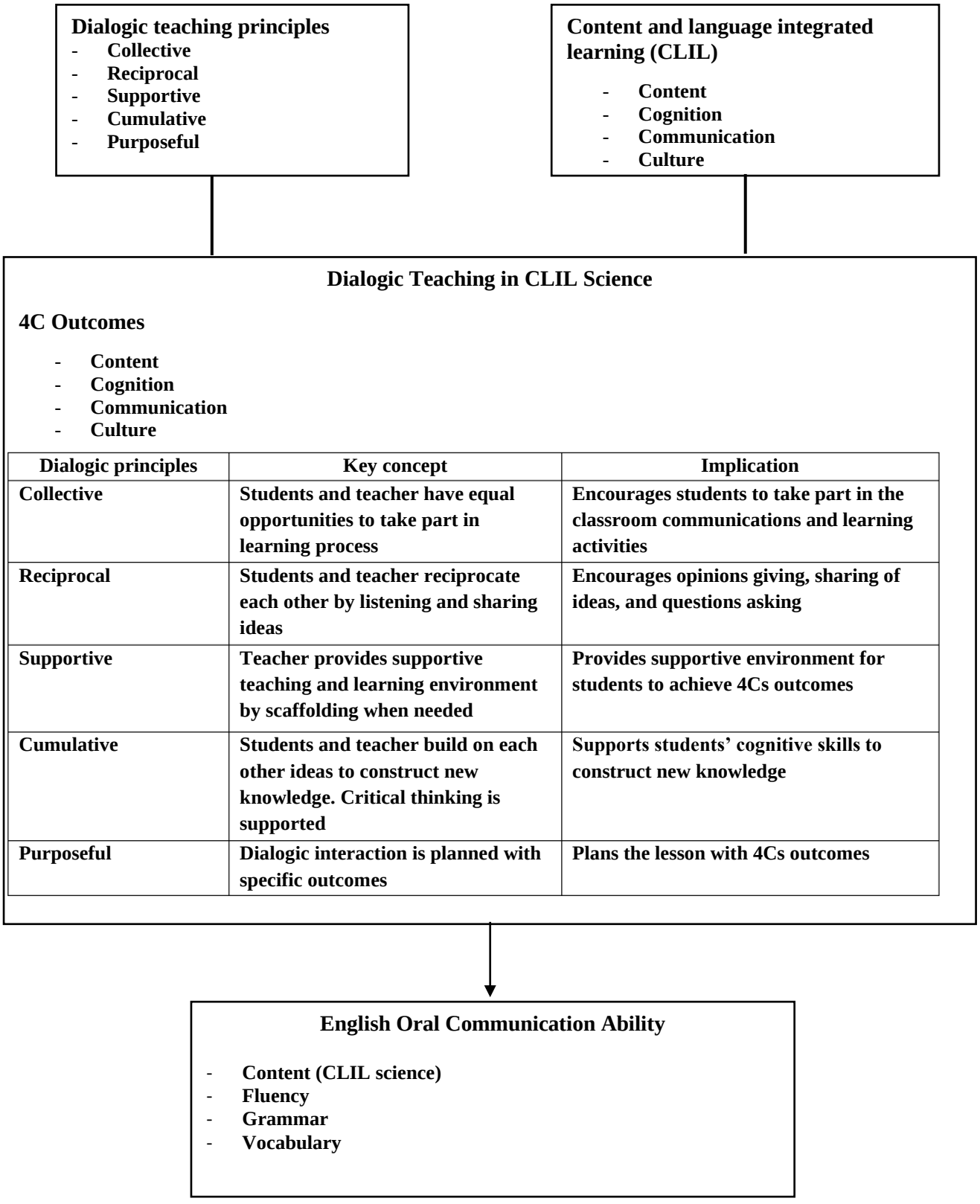
Lastly, the fifth section, oral communication refers to an ability to express, state, clarify, define, and explain information. In CLIL Science subject, would students orally communicate about subject matters in CLIL Science subject. Thus, the

languages for English oral communication are concerned with cognitive academic language proficiency (CALP).

Therefore, the conceptual framework of this study was developed based on the literature review. First, the five principles of dialogic teaching and the 4Cs elements in a framework of CLIL came together to create an instructional model in dialogic teaching in CLIL Science subject.

Specifically, in the lesson plan, 4C's elements namely: Content, Cognition, Communication and Culture were made as learning outcomes meaning that students had to achieve both content and language outcomes. As for the five key principles of dialogic teaching, they shaped the interactions in the lesson to be interactive in knowledge co-construction process between students and the teacher as illustrated in the key concepts and the implications provided. Consequently, the instruction would lead to the enhancement of English oral communication ability in the aspect of content of CLIL Science, fluency, vocabulary, and grammar. Figure 1 illustrates the conceptual framework of using dialogic teaching in CLIL Science lesson to enhance English oral communication ability of third grade students in English program.

2.7 Research framework



Dialogic principles	Key concept	Implication
Collective	Students and teacher have equal opportunities to take part in learning process	Encourages students to take part in the classroom communications and learning activities
Reciprocal	Students and teacher reciprocate each other by listening and sharing ideas	Encourages opinions giving, sharing of ideas, and questions asking
Supportive	Teacher provides supportive teaching and learning environment by scaffolding when needed	Provides supportive environment for students to achieve 4Cs outcomes
Cumulative	Students and teacher build on each other ideas to construct new knowledge. Critical thinking is supported	Supports students' cognitive skills to construct new knowledge
Purposeful	Dialogic interaction is planned with specific outcomes	Plans the lesson with 4Cs outcomes

Figure 1 Research Framework of Using Dialogic Teaching in CLIL Science to Enhance English Oral Communication Ability of Third Grade Students in English Program

Chapter 3

Research Methodology

This present study aims to investigate the effects of dialogic teaching in CLIL Science in enhancing English oral communication ability of third grade students of English program and to explore the opinions of third grade students of English program towards dialogic teaching in CLIL Science. This chapter outlines the overall design of research methodology and procedures used in this study. The population and the sample are presented, followed by the development and validation of the research instruments. Finally, data collection and data analysis are discussed.

3.1 Research Design

This study employed one group pretest-posttest research design. It aimed to investigate the effect of dialogic teaching in CLIL Science subject on English oral communication ability of primary students in English program. Following the treatment, students' opinions on the approach were examined through a semi-structured interview. The pretest and posttest were obtained and analyzed in order to provide evidence of the effects of dialogic teaching on students' English oral communication ability. The design of this research was illustrated in Figure 2 in which X presented the treatment of the research called dialogic teaching, and O_1 and O_2 were the measurement of dependent variable naming English oral communication ability.

O_1	**X**	**O_2**

Figure 2 Research design

3.2 Population and Participants

3.2.1 Population

The population of this study was primary students in English Program at a private school in Phra Nakhon Si Ayutthaya province, Thailand.

3.3.2 Participants

The participants in the study were forty third grade students who studied in English Program in the second semester of the 2020-2021 academic year. The participants studied at Jirasartwitthaya School located in Phra Nakhon Si Ayutthaya province in Thailand. They were an intact group from two English program classes and were selected based on convenience sampling.

3.3 Context of the study

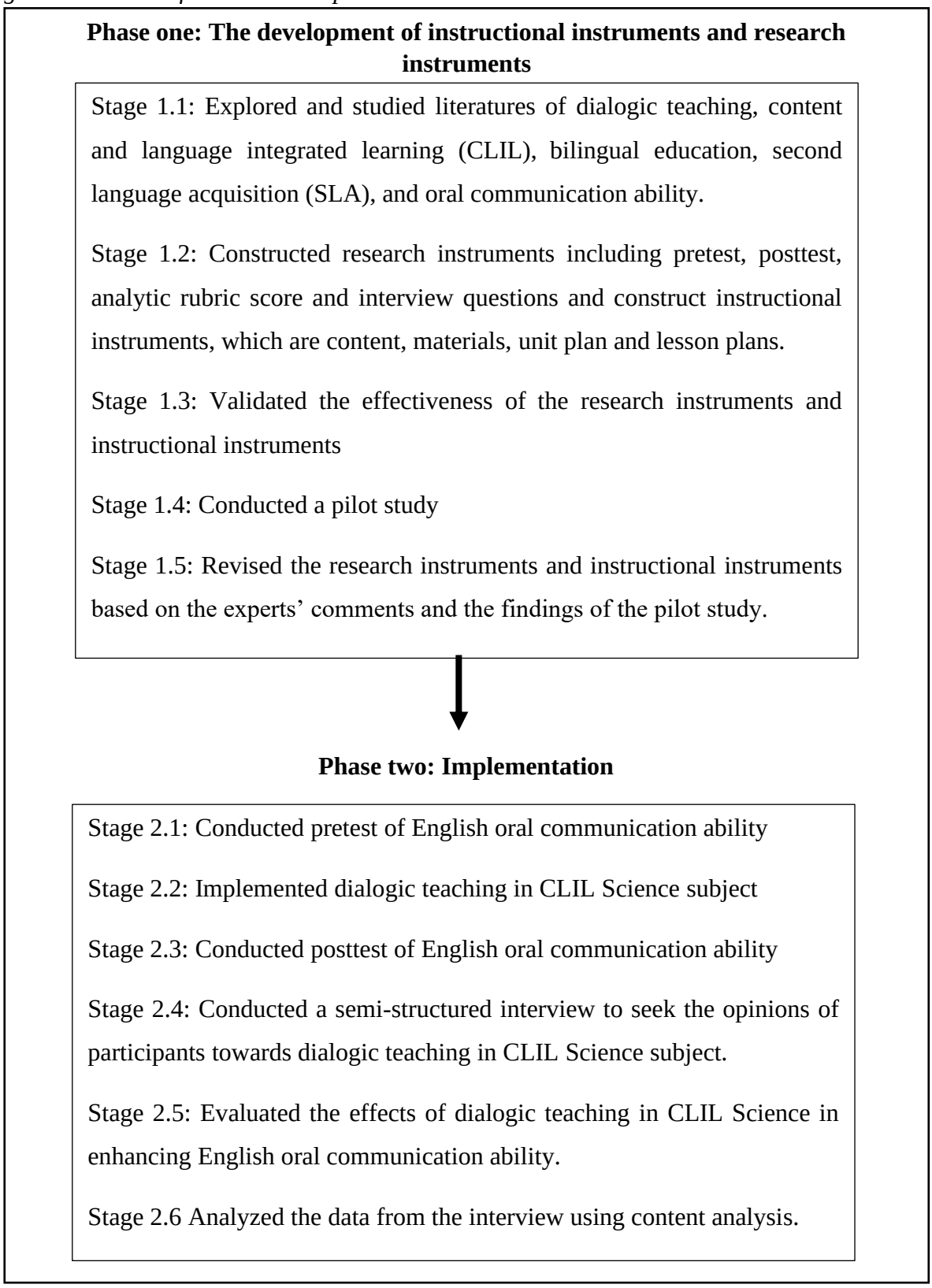
This study was conducted at Jirasartwitthaya School, a large size co-educational private school in Phra Nakon Si Ayutthaya, Thailand. The school provides an education ranging from Pre-kindergarten to Grade 9. English Program is one of the additional programs offered by the school to students from Grade 1 to Grade 6. Under English Program, English is a language of instruction for four core subjects including CLIL Science. Students of English Program study the core subjects that are taught in English for 17 hours per week.

3.4 Research procedures

The study was divided into two phases. The first phase was the development of instructional instruments and research instruments. The second phase was the

implementation and the evaluation of the instruments. The details of the research procedures are presented in Figure 3.

Figure 3 Details of the research procedures



Phase one: the development of instructional instruments and research instruments

The development of instructional instruments and research instruments was carried out in five stages.

Stage 1.1: Explored and studied literatures of dialogic teaching, content, and language integrated learning (CLIL), bilingual education, second language acquisition (SLA), and oral communication ability.

1.1.1 Dialogic teaching

In this study, the dialogic teaching was implemented in a CLIL Science subject in third grade classrooms of English program. Dialogic teaching refers to an approach, with five key principles, that aims to encourage students-centered instruction by providing supportive and joint interactional spaces in the classroom for students and teachers to critically exchange ideas and information to co-construct knowledge (Robin Alexander, 2010). The five key principles of dialogic teaching shaped interactions between students and the teacher to be dialogic and hence, allowed students to achieve learning outcomes and English oral communication ability namely: Content, Fluency, Vocabulary and Grammar.

1.1.2 Content and Language Integrated Learning (CLIL)

In this study, Content and Language Integrated Learning (CLIL) was implemented in Science subject of English program; CLIL Science. CLIL refers to a dual-focused approach in which a second language (L2) is used as a language of instruction and a language of learning content subjects (Dorothy Coyle et al., 2010). CLIL is shaped by a framework known as a 4Cs framework, which consisted of

content, communication, cognition, and culture (Do Coyle, 2007). Hence, the emphasis f CLIL Science was on science content and English language and elements from a 4Cs framework were the learning outcomes of a CLIL Science subject.

1.1.3 Bilingual Education

In this study, the participants were students of English program, which is under Thailand's bilingual education platform. Bilingual education refers to education with an aim to promote bilingual and multilingual competence using two or more languages as medium of instructions for a majority portions of the school curriculum (Genesee, 2004). Thus, the aim of English Program is to enhance students' proficiency of English in all skills through content and language instructions and to foster bilingual and biliteracy students. Specifically, in this study, English is a language of instruction for CLIL science subject. Therefore, students in CLIL science of English program developed not only content knowledge but also language knowledge.

1.1.4 Second Language Acquisition (SLA)

In this study, Second Language Acquisition (SLA) was a supported theory. SLA, as defined by Susan M Gass (2013), is a process of learning a second/another language after students' first language. In addition to SLA, input hypothesis (Krashen, 1985), interaction hypothesis (M. H. Long, 1981), output hypothesis (Merrill Swain, 2000) and social constructivism (H Douglas Brown, 2014) were supported hypotheses and schools of thought.

1.1.5 Oral communication ability

In this study, oral communication ability was an ability evaluated before and after the implementation of the instructional instruments. Oral communication ability refers to an ability to express, state, clarify, define and explain information (Khaled Mohsen Mohammed Zuheer, 2008). Specifically, students used content knowledge, fluency, vocabulary, and grammar knowledge to orally communicate information in CLIL science subject.

Stage 1.2: Constructed research instruments including pretest, posttest, analytic rubric score, and interview questions and construct instructional instruments, which are content, materials, unit plan and lesson plans.

Three research instruments in the study were used including pretest, posttest, and interview questions. First, the pre- and posttests were conducted to investigate the effects of dialogic teaching in CLIL Science subject in enhancing English oral communication ability of third grade students in English program. Second, the interview was conducted to seek opinions third grade students in English program towards dialogic teaching in CLIL Science.

3.5 Research instruments

The research instruments in this study include English oral communication ability tests, analytic rubric score for English oral communication ability and interview questions.

- **English oral communication ability Pretest and Posttest**

To investigate the effect of dialogic teaching in enhancing English oral communication ability, English oral communication ability pretest and posttest were

conducted. The pretest was conducted in the first week and the posttest was conducted on the eleventh week.

The pretest and posttest were Question Cards (as seen in Appendix A) that contained open-ended questions from the units on Life Science and Physical Science. The tests consisted of four topics and eight questions. Specifically, the topics were 1) Living Things vs. Non-living Things, 2) Life Cycles, 3) Materials and 4) Forces. There were two questions under each topic.

The tests were parallel meaning that they were similar in difficulty level and in question formats. In saying that, students got parallel question cards on both tests. In other words, students who got a question on life cycles of an animal for pretest would get a question on the life cycle of a different animal for posttest.

In administration the tests, each student received up to 10 minutes to orally respond to the question in English. Follow-up questions were prepared and asked for elaboration and clarification purposes. Students' English oral communication ability was evaluated using the analytic rubric for English oral communication ability.

- **Analytic rubric for English oral communication ability**

Students' English oral communication ability was evaluated using an analytic rubric adapted from TOEFL Junior Speaking Scoring Guide (Educational Testing Service, 2018) in speaking-listening task (as seen in Table 2).

The criteria of evaluation were content, fluency, grammar, and vocabulary. The content referred to the correctness of information in CLIL Science subject. Fluency referred to the smoothness or the flow of the speech. Grammar referred to the correctness of grammatical structures used in speech. Finally, vocabulary referred to the appropriateness of vocabulary used in speech.

The analytic rubric for English oral communication is ranged from 1 as the lowest to 4 as the highest. The description of the analytic rubric presented as illustrated below:

Table 2 The analytic rubric for English oral communication ability

	4	**3**	**2**	**1**
Content	Shows a **full** understanding of the topic by expressing correct **and** sufficient key information	Shows a **good** understanding of the topic by expressing correct **but** leaving out **a few** key information	Shows a **limited** understanding of the topic by expressing correct **but** leaving out **most** key information	Shows **no** understanding of the topic by expressing incorrect information **and/or** leaving out **all** key information
Fluency	Expresses information smoothy, with **little** hesitation, which do not interfere with utterances	Expresses information with **some** hesitations, which do not interfere with utterances	Expresses information with **some** hesitations, which slightly interferes with utterances	Expresses information with **a lot of** hesitations, which greatly interferes with utterances
Grammar	Expresses information with **all** correct basic grammar structures	Expresses information with **most** correct basic grammar structures	Expresses information with **some** correct basic grammar structures	Expresses information with **little** correct basic grammar structures
Vocabulary	Shows a **full** understanding of vocabulary on the topic by using **all** correct vocabulary	Shows a **good** understanding of vocabulary on the topic by using **most** correct vocabulary	Shows a **limited** understanding of vocabulary on the topic by using **a few** correct vocabulary	Shows **no** understanding of vocabulary on the topic by using **incorrect** vocabulary

- **Interview questions**

To seek the opinions of third grade students towards dialogic teaching in CLIL Science subject, the semi-structure interview was conducted in the eleventh week of the study, after the completion of post-test. Interviewees were students who were selected randomly from two classes based on their posttest scores. Specifically, two students from low, middle, and high-performance groups were selected for the semi-structured interview. The semi-structured interview was conducted in Thai and took about 10 minutes per session. The pre-prepare questions are as follows:

1. นักเรียนรู้สึกอย่างไรกับการเรียนแบบนี้ ?
   (How do you feel about learning CLIL science through dialogic teaching?)

2. การเรียนแบบนี้ทำให้นักเรียนเข้าใจสิ่งที่เรียนไหม? เข้าใจ/ไม่เข้าใจ เพราะอะไร ?

   (Does learning CLIL science through dialogic teaching lead to content comprehension? If yes, how? / if no, why?)

3. การเรียนแบบนี้ทำให้นักเรียนพูดภาษาอังกฤษบ่อยขึ้นไหม ? บ่อยขึ้น/ไม่บ่อยขึ้น เพราะอะไร ?

   (Does learning CLIL science through dialogic teaching allow you to orally communicate in English more often? if yes, how? / if no, why?)

3.6 Instructional instruments

- Content

In this study, content taught in CLIL science subject corresponded to the standard and indicators of primary three science subject stated in the revised version of Basic Education Core Curriculum B.E. 2560 (A.D. 2017) as illustrated in table 3.

Table 3 Scope and Sequence of Dialogic teaching in CLIL Science

Week	Unit	Learning standard	Indicator and core content
1- 4	1	Standard SC 1.2	Strand 1: life science 1. Describe necessities for humans and animals to leave and grow from collected data 2. Realize the importance of food water and air by taking good care of ourselves and animals 3. Make a model to describe the lifecycles of animals and to compare the lifecycles of some animals 4. Realize the value of animal lives by not do anything that effects their life cycles
5-6	2	Standard SC 2.1	Strand 2: physical science 1. Explain that an object is made up of different parts which can be deconstructed and reconstructed into a new object based on empirical evidence. 2. Explain how material changes when heated or cool based on empirical evidence
7-10	3	Standard SC 2.2	1. Identifying the result of forces that change the motion of an object based on empirical evidence 2. Compare and give examples of contact and noncontact forces that change the motion of an object based on empirical evidence 3. Classify objects by their property of magnetic attractions based on

Week	Unit	Learning standard	Indicator and core content
			empirical evidence 4. Identify magnetic poles and predict what will happen when two different poles are placed closely based on empirical evidence

- **Materials**

In this study, the materials used were a Targeting Science Primary 3 Book, sentence stems posters to be used during dialogic interactions, PowerPoint presentations, online videos, realia materials and other visual aids.

- **Lesson plans**

In this study, ten dialogic teaching in CLIL Science lesson plans were constructed and implemented to forty third grade students in English Program. The lessons were conducted as in-person lessons. Each lesson plan consisted of a topic, learning outcomes based on CLIL's 4Cs framework namely: Content, Cognition, Communication and Culture, and steps of teaching in which five principles of dialogic teaching namely: Collective, Reciprocal, Supportive, Cumulative and Purposeful shaped the interactions of students and the teacher. A lesson plan sample is as seen in Appendix D.

Stage 1.3: Validated the effectiveness of the research instruments and instructional instruments

In this study, research and instructional instruments were validated by three experts in the fields of applied linguistic and English language teaching who have at least five years' experience in the field.

Research instruments validity

The research instruments were validated to see the test's usefulness (Bachman & Palmer, 1996). The content validity was measured by the panel of three experts who have experiences in the fields of applied linguistics, English language teaching, and assessment and evaluation for more than five years. The three experts used Item-Objective Congruence (IOC) to validate. The result of IOC was rated as follows:

+1	means	Congruent
0	means	Questionable
-1	means	Incongruent

The content validity result was calculated by using the IOC index formula (Pinyoanunthaphong, 1983) as illustrated below:

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

IOC	means	The index of congruent
R	means	Total scores from the expert's opinions
N	means	The number of the expert

The result of IOC must be higher than 0.5 according to the agreement of at least two experts in order to affirm that the content is valid (Yaghmaie, 2003). Otherwise, the test must be revised according to the suggestions and comments from the experts.

Pretest, Posttest, and Analytic Rubric for English oral communication ability

According to the results of the total index-objective congruence (IOC) of the pretest and posttest, all the three experts agreed on the appropriateness of the three criteria including Level of difficulty, Task type, and Time. However, the total index-objective congruence for the quality of questions received a score of 0.67 with comments that some questions should be more open-ended to enhance responses and some pictures should clearer. For example, a question “Which is a living thing in the room?” was changed to " How do you know that a dog is living thing?”. As for the analytic rubric for English oral communication ability, all three experts also agreed on the appropriateness of the criteria of Format (score of 1) and Appropriateness (score of 1).

Interview questions

According to the results of the total index-objective congruence (IOC) of the interview questions, all three experts agreed on the appropriateness of the criteria naming Questions (score of 1) and Time (score of 1).

Research instrument reliability

Reliability check was carried out to examine the consistency between two raters using an analytic rubric adapted from TOEFL Junior Speaking Scoring Guide (Educational Testing Service, 2018). The first rater was the researcher, and the second rater was a CLIL Science teacher in the school. Both raters evaluated students' English oral communication using the analytic rubric together. Using Cohen's Kappa method to interpret the reliability, the results of inter-reliability of the pretest and posttest were 0.80 and 0.90 respectively. The results indicated that two raters had an almost perfect agreement. (McHugh, 2012).

Instructional instrument validity

The instructional instruments were validated in order to be ensured of the test usefulness (Bachman & Palmer, 1996). The content validity was measured by the panel of three experts who have experiences in the fields of applied linguistics, English language teaching, and assessment and evaluation more than five years. The three experts used Item-Objective Congruence (IOC) to validate. The result of IOC was rated as follows:

+1	means	Congruent
0	means	Questionable

-1 means Incongruent

The content validity result was calculated by using the IOC index formula (Pinyoanunthaphong, 1983) as illustrated below:

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

IOC means The index of congruent

R means Total scores from the expert's opinions

N means The number of the expert

The result of IOC must be higher than 0.5 according to the agreement of at least two experts in order to affirm that the content is valid (Yaghmaie, 2003). Otherwise, the test must be revised according to the suggestions and comments from the experts.

Lesson plan

According to the results of the total index-objective congruence of the lesson plan, all three experts agreed on nine criteria: Learning outcome, Content outcome, Cognition outcome, Communication out, Culture outcome, Dialogic teaching principles, Materials, Activity and Time. However, the total index-objective congruence for assessment was 0.67 with comments that an assessment should be presented as an integrate language and content. In other words, the assessment should assess students' English oral communication ability as well as content knowledge in CLIL Science. For instance, an assessment aimed for students to fill in the blank the three basic needs for humans was changed to as assessment aimed for students to

orally discuss the three basic needs of a person in their families and why they are considered basic needs.

Stage 1.4: Conducted a pilot study

In this study, a pilot was conducted to try out the instructional and research instruments. The instructional instruments used in the pilot study were Content, Materials, Lesson plans. The research instruments used in the pilot study were Pretest, Posttest, and Analytic rubric score.

The pilot study was conducted by the researcher, which took over 2 weeks being 60 minutes per lesson. Those instruments were piloted to 10 students who were not included in the study but shared the similar characteristics with the participants of the present study. Specifically, students in the pilot study were also third grade students but enrolled in a Mini English Program (MEP), a program similar to English program in that English is also a language of instruction for content subjects including CLIL Science. However, students of MEP study those core subjects for only 14 hours per week.

The findings of the pilot study were discussed as follows.

English oral communication ability pretest

First, the English oral communication ability pretest was piloted. Students, one at a time, were brought to one of the corners of the classroom while the rest were doing their independent reading at their desks. After piloting the pretest to all ten students, the findings indicated that questions on the pretest needed follow up questions to aid students' thinking and utterances. The finding also showed that

pictures that went with the questions and time allocation were appropriate for students.

Analytic rubric score for English oral communication ability

Next, the rating process was piloted to ensure the quality of the reliability of the English oral communication ability analytic rubric adapted from TOEFL Junior Speaking Scoring Guide (Educational Testing Service, 2018) in speaking-listening task. The first rater was the researcher, and the second rater was a CLIL Science teacher in the school. Both raters evaluated students' English oral communication using the analytic rubric together. After scoring students, the researcher, and another rater got together to discuss the scores; how and why scores were the same or different. Using Cohen's Kappa method to interpret the reliability, the results of inter-reliability of the pretest and posttest were 0.80 and 0.85 respectively. The results indicated that two raters had an almost perfect agreement.

Lesson plans

Next, the researcher implemented dialogic teaching CLIL Science lessons to ten third grade students. The findings indicated that using simple language, providing sentence starters, and sitting in a circle created a positive learning environment, which enabled students to participate in the dialogic interactions better. Moreover, asking follow-up questions and explanations helped increase students' understanding and interactions. It was also found that the teacher needed to lead the dialogic interactions and to start the dialogic interactions with information that students had some background knowledge of and more importantly, gave students time to get comfortable and familiarize with the newly introduced teaching method.

English oral communication ability Posttest

After piloting the posttest, the findings indicated that questions on the posttest also needed follow-up questions to aid students' thinking and utterances and the pictures that went with the questions and time allocation were appropriate for students.

Next, the rating process was piloted again to ensure the quality of the reliability. The researcher and another rater scored the test with the same analytic scoring rubric. After scoring students, the researcher, and another rater got together to discuss the scores; how and why scores were the same or different. Using Cohen's Kappa method to interpret the reliability, the results of inter-reliability of the pretest and posttest were 0.80 and 0.85 respectively. The results indicated that two raters had an almost perfect agreement.

Stage 1.5: Revised the research instruments and instructional instruments based on the experts' comments and the findings of the pilot study.

The instruments were revised according to the findings of the pilot study and the comments from the experts. First, some questions on the pretest and posttest were revised to be more open-ended with follow-up questions. Pictures were changed for some questions to be clearer. Simple sentence starters were prepared and made visible for students to enhance dialogic interactions during the lessons. Finally, the end of the lessons' assessments was revised to emphasize on both language and content as well as to be less fixed.

Phase two: Implementation

The implementation phase was carried out in six stages.

Stage 2.1 Conducted pretest of English oral communication ability

Students, one at a time, were called to another room next to the classroom. They were presented with four topics cards namely living vs. non-living, life cycles, materials, and forces. Students were asked to choose a topic that they like to answer the question. Then, they were presented with 2 questions cards under the selected topic. The questions cards were faced down. Next, students had to choose one of the question cards and were asked to read the question on the card aloud. Then, the teacher read the question aloud to the students to enhance comprehension. Students were given 10 minutes to orally respond to the question in English. Students' English oral communication ability was evaluated using the analytic rubric for English oral communication ability by the research and another rater, who was a CLIL Science teacher.

Stage 2.2 Implemented dialogic teaching in CLIL Science subject

Dialogic teaching in CLIL Science subject was implemented over the period of nine weeks to two classes of third grade English program. Each third-grade English program class had twenty students, who were mixed ability, and each class was met twice a week, Tuesday, and Friday.

Stage 2.3 Conducted posttest of English oral communication ability

Students, one at a time, were called to another room next to the classroom. They were presented with a question card paralleled to the question card received in their pretest. They were asked to read a question aloud before being read to for better

comprehension. They were given 10 minutes to orally respond in English. Students' English oral communication ability was evaluated using the analytic rubric for English oral communication ability by the research and another rater, who was a CLIL Science teacher.

Stage 2.4 Conducted a semi-structured interview to seek the opinions of participants towards dialogic teaching in CLIL Science subject.

The semi-structured interview was conducted after the administration of posttest on six students were randomly selected based on the pretest and the posttest scores. That is, two students from the low performance, two students from the middle performance, and two students from the high-performance groups. The semi-structured interviews were conducted in Thai and took about 10 minutes per person.

Stage 2.5 Evaluated the effects of dialogic teaching in CLIL Science in enhancing English oral communication ability.

To evaluate the effect of dialogic teaching in CLIL Science in enhancing English oral communication ability, pretest and posttest scores were statistically analyzed using a paired samples t-test to compare the differences.

Stage 2.6 Analyzed the data from the interview using content analysis.

The data from the semi-structured interview was analyzed using content analysis.

3.7 Data Collection Procedures

In this study, the data collection was conducted by the researcher, which took eleven weeks in-person with forty third grade students who studied in English

Program in the second semester of the 2020-2021 academic year at Jirasartwitthaya School located in Phra Nakhon Si Ayutthaya province in Thailand. The permission to collect data was granted by the school and parents of students. The data collection process in this present study was as follows:

Week 1: Pretest

The pretest was administrated on the first lesson of week for both classes. It aimed to assess students' English oral communication ability prior to the implementation of dialogic teaching in CLIL science subject in the following nine weeks. As aforementioned, the pretest was a set of Question Cards, which contained open-ended questions from units on Life Science and Physical Science. In conducting pretest, the following steps were carried out,

Students, one at a time, were called to another room next to the classroom. They were presented with four topics cards namely living vs. non-living, life cycles, materials, and forces. Students were asked to choose a topic that they would like to answer the question to. Then, they were presented with 2 question cards under the selected topic. The question cards were faced down. Next, students had to choose one of the question cards and were asked to read the question on the card aloud. Then, the teacher read the question aloud to the students to enhance comprehension. Students were given 10 minutes to orally respond to the question in English. Students' English oral communication ability was evaluated using the analytic rubric for English oral communication ability by the research and another rater, who was a CLIL Science teacher.

Week 2-10: Implementation of Dialogic teaching in CLIL Science

Ten dialogic teaching CLIL Science lessons were implemented from the second week to the tenth week. The duration of each lesson plan was 60 minutes. Each class had two lessons per week.

Week 11: Post-test and semi-structured interview

The posttest was administrated on week eleven. The posttest was parallel to the pretest. In conducting the posttest, the following steps were carried out,

Students, one at a time, were called to another room next to the classroom. They were presented with a question card paralleled to the question card received in their pretest. They were asked to read a question aloud before being read to for better comprehension. They were given 10 minutes to orally respond in English. Students' English oral communication ability was evaluated using the analytic rubric for English oral communication ability by the researcher and another rater, who was a CLIL Science teacher.

Following the posttest, the semi-structured interview was carried out on six students were randomly selected based on the pretest and the posttest scores. Specifically, two students were from the low performance, two students from the middle performance, and two students from the high-performance groups. The semi-structured interviews were conducted in Thai and took about ten minutes per person.

The summary of the data collection procedures was illustrated in Table 4.

Table 4 Summary of data collection procedures

Week	**Unit**
Week 1	Pretest

Week	**Unit**
Week 2	Unit 1: Human and Animal Lives Lesson 1: How do we live?
Week 3	Unit 1: Human and Animal Lives Lesson 2: How do animals live?
Week 4	Unit 1: Human and Animal Lives Lesson 3: Lift cycles of animals
Week 5	Unit 2: Materials Lesson 1: How can we make an object?
Week 6	Unit 2: Materials Lesson 2: How do material change?
Week 7	Unit 3: Forces and how an object moves Lesson 1: Magnets
Week 8	Unit 3: Forces and how an object moves Lesson 2: Benefits of magnets
Week 9	Unit 3: Forces and how an object moves Lesson 3: Forces and results of forces acting on an object
Week 10	Unit 3: Forces and how an object moves Lesson 4: Contact and non-contact forces
Week 11	Posttest Semi-structured interview

3.8 Data Analysis

In this study, in order to address the two research questions, the collected data were analyzed using quantitative and qualitative approaches. In this regard, two criteria were considered including students' English oral communication ability from the implementation of dialogic teaching in CLIL Science and students' opinions toward dialogic teaching in CLIL Science.

Data analysis for research question 1

To investigate the first research question, three research instruments were used to measure students' English oral communication ability naming a pretest, a posttest, and the analytic rubric score. The data was analyzed using a paired-sample t-test. Descriptive statistics (means and standard deviation) were computed to find the differences in students' English oral communication ability, in overall and in four aspects namely: content, fluency, vocabulary and grammar.

Data analysis for research question 2

To investigate the second research question, semi-structured interview was conducted to seek participants' opinions toward dialogic teaching in CLIL Science and content analysis was used to analyze the collected data. Specifically, responses from the semi-structured interviews were transcribed and emerged themes from the data were used (Hsieh & Shannon, 2005). Table 5 presents the summary of data analysis process.

Table 5 Summary of data analysis process

Research objectives	**Research instruments**	**Analysis methods**
1. To investigate the effects of dialogic teaching in CLIL Science in enhancing English oral communication ability of third grade students of English program.	Pre-test and Post-test	A paired samples T-test
2. To investigate the opinions of third grade students of English program towards dialogic teaching in CLIL Science	Semi- structured interview	Content analysis

Chapter 4

Findings

This chapter presents the results of the study concerning the effects of dialogic teaching in CLIL Science on English oral communication ability of third grade students of English program. Prior and follow the implementation of dialogic teaching in CLIL Science, the pretest and posttest of English oral communication ability were employed. Moreover, students' opinions dialogic teaching in CLIL Science were collected from a semi-structured interview and analyzed.

The results of the study were presented according to the research questions in this study, as follows:

Research Question 1: To what extent can dialogic teaching in CLIL Science subject enhance English oral communication ability of third grade students of English program?

To investigate the effects of dialogic teaching in CLIL Science in enhancing English oral communication ability. The data from English oral communication ability pretest and posttest was analyzed. The mean scores from pretest and posttest were compared using a paired sample t-test. The analyzed results are presented and discussed below.

Table 6 Comparison of mean scores in English oral communication ability using Paired Sample t-test

English oral communication ability		Paired Differences		t	df	Sig. (2-tailed)
		Mean	Std. Deviation			
Overall	Posttest - Pretest	4.10	1.13	22.99	39	0.000**

** p < .01

Table 6 illustrated that dialogic teaching in CLIL science enhanced English oral communication ability significantly (p-value = 0.000). Specifically, after the implementation of dialogic teaching in CLIL science, the difference of the mean scores on the pretest and on the posttest was 4.10 (S.D. = 1.13). This means that most students' posttest scores increased on the average of 4.10 points. Furthermore, considering that t-value is 22.99, the statistical result indicated that dialogic teaching in CLIL science enhanced English oral communication ability significantly.

Table 7 Descriptive Statistics of English oral communication ability in pretest and posttest

English Oral Communication Ability	N	Mean	Std. Deviation	Skewness		Kurtosis	
				Statistic	Std. Error	Statistic	Std. Error
Pretest	40	5.95	1.40	-0.09	0.37	-0.30	0.73
Posttest	40	10.05	1.24	-0.27	0.37	-0.32	0.73

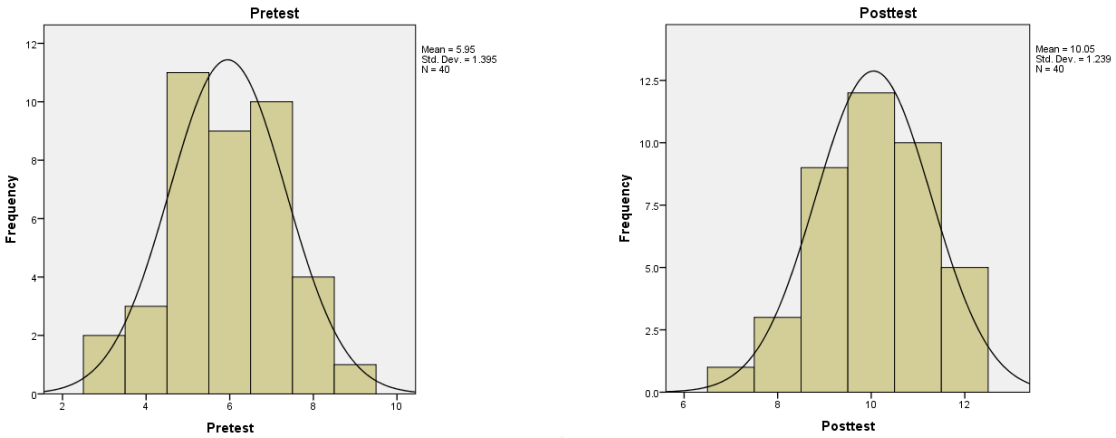


Figure 4 Histogram of normal curve of pretest and posttest

From Table 7, the level of skewness and the level of kurtosis from the pretest and the posttest were not over 1. Hence, led to a normal curve as shown in Figure 4. Additionally, the standard deviation (S.D.) of pretest score was 1.40 and of posttest score was 1.24. The values of S.D. indicated that students' mean scores were closed together, which can be interpreted that students' performances were at similar level across the board. Additionally, the mean score of the pretest was 5.95. Then, after the implementation of dialogic teaching in CLIL Science, the mean score of the posttest was 10.05. The mean score increased by 4.15 points. The statistical results indicated that dialogic teaching in CLIL Science enhanced English oral communication ability.

Additionally, to measure the magnitude of the effectiveness of dialogic teaching in CLIL Science on English oral communication ability, the effect size value was calculated using Cohen's *d*. The result was as shown in Table 8.

Table 8 The effect size of using dialogic teaching in CLIL Science on English oral communication ability

Cohen'd	Effect Size
3.11	Large

According to Cohen (1988), when $d < .20$, the effect size is small, when $.20 < d < .80$, the effect size is medium and when $d > .80$, the effects size is large. Thus, the result in Table 8 indicated that dialogic teaching in CLIL Science had a large effect size ($d = 3.11$) in enhancing English oral communication ability.

Next, to examine the difference in English oral communication ability in analytical view of the investigated aspects, the mean scores from pretest and posttest of each aspect of English oral communication ability were compared using a paired sample t-test. The analyzed results are presented and discussed below.

Content

Table 9 Descriptive Statistics of Content in Pretest and Posttest

English oral communication ability	Paired Differences		t	df	Sig. (2-tailed)
	Mean	Std. Deviation			
Content	Posttest - Pretest	1.08	0.66	10.37	39	0.000**

** p < .01

Table 9 showed the statistical results of English oral communication ability in the aspect of Content in pretest and posttest. When examining content, dialogic teaching in CLIL science enhanced English oral communication ability in the aspect of content significantly (p-value = 0.000). Specifically, after the implementation of dialogic teaching in CLIL science, the difference of the mean scores on the pretest

and on the posttest of content was 1.08 (S.D.= 0.66). This means that most students' posttest scores increased on the average of 1.08 points. Furthermore, considering that t-value is 10.37, the statistical result indicated that dialogic teaching in CLIL science enhanced English oral communication ability in the aspect of content significantly. In sum, the data indicated that dialogic teaching in CLIL Science could enhnace English oral communication ability in the aspect of Content as the mean score went up.

Fluency

Table 10 Descriptive Statistics of Fluency in Pretest and Posttest

English oral communication ability		**Paired Differences**		**t**	**df**	**Sig. (2-tailed)**
		Mean	**Std. Deviation**			
Fluency	Posttest - Pretest	0.95	0.85	7.10	39	0.000**

** p < .01

Table 10 showed the statistical results of English oral communication ability in the aspect of Fluency in pretest and posttest. When examining fluency, the second investigated aspect, dialogic teaching in CLIL science enhanced English oral communication ability in the aspect of fluency significantly (p-value = 0.000). Specifically, after the implementation of dialogic teaching in CLIL science, the difference of the mean scores on the pretest and on the posttest of fluency was 0.95. This means that most students' posttest scores increased on the average of 0.95 points. Furthermore, considering that t-value is 7.10, the statistical result indicated that dialogic teaching in CLIL science enhanced English oral communication ability in the aspect of content significantly. In sum, the data indicated that dialogic teaching in

CLIL Science could enhnace English oral communication ability in the aspect of Fluency as the mean score went up.

Grammar

Table 11 Descriptive Statistics of Grammar in Pretest and Posttest

English oral communication ability	**Paired Differences**		**t**	**df**	**Sig. (2-tailed)**
	Mean	**Std. Deviation**			
Grammar Posttest - Pretest	0.83	0.78	6.68	39	0.000**

** p < .01

Table 11 showed the statistical results of English oral communication ability in the aspect of Grammar in pretest and posttest. When examining grammar, the third investigated aspect, dialogic teaching in CLIL science enhanced English oral communication ability in the aspect of grammar significantly (p-value = 0.000). Specifically, after the implementation of dialogic teaching in CLIL science, the difference of the mean scores on the pretest and on the posttest of grammar was 0.83. This means that most students' posttest scores increased on the average of 0.83 points. Furthermore, considering that t-value is 6.68, the statistical result indicated that dialogic teaching in CLIL science enhanced English oral communication ability in the aspect of content significantly. In sum, the data indicated that dialogic teaching in CLIL Science could enhnace English oral communication ability in the aspect of Grammar as the mean score went up.

Vocabulary

Table 12 Descriptive Statistics of Vocabulary in Pretest and Posttest

English oral communication ability		Paired Differences		t	df	Sig. (2-tailed)
		Mean	Std. Deviation			
Vocabulary	Posttest - Pretest	1.18	0.75	9.95	39	0.000**

** p < .01

Table 12 showed the statistical results of English oral communication ability in the aspect of Vocabulary in pretest and posttest. When examining vocabulary, the fourth investigated aspect, dialogic teaching in CLIL science enhanced English oral communication ability in the aspect of vocabulary significantly (p-value = 0.000). Specifically, after the implementation of dialogic teaching in CLIL science, the difference of the mean scores on the pretest and on the posttest of vocabulary was 1.18. This means that most students' posttest scores increased on the average of 1.18. points. Furthermore, considering that t-value is 9.95, the statistical result indicated that dialogic teaching in CLIL science enhanced English oral communication ability in the aspect of content significantly. In sum, the data indicated that dialogic teaching in CLIL Science could enhnace English oral communication ability in the aspect of Vocabulary as the mean score went up.

Summary of Findings for Research Question 1

The summary of the findings for research question 1 were as illustrated in table 12 and figure 5 below.

Table 13 Summary of comparison of mean scores in English oral communication ability using Paired Sample t-test

English oral communication ability		Paired Differences		t	df	Sig. (2-tailed)
		Mean	Std. Deviation			
Overall	Posttest - Pretest	4.10	1.13	22.99	39	0.000**
Content	Posttest - Pretest	1.08	0.67	10.37	39	0.000**
Fluency	Posttest - Pretest	0.95	0.85	7.10	39	0.000**
Grammar	Posttest - Pretest	0.83	0.78	6.68	39	0.000**
Vocabulary	Posttest - Pretest	1.18	0.75	9.97	39	0.000**

** p < .01

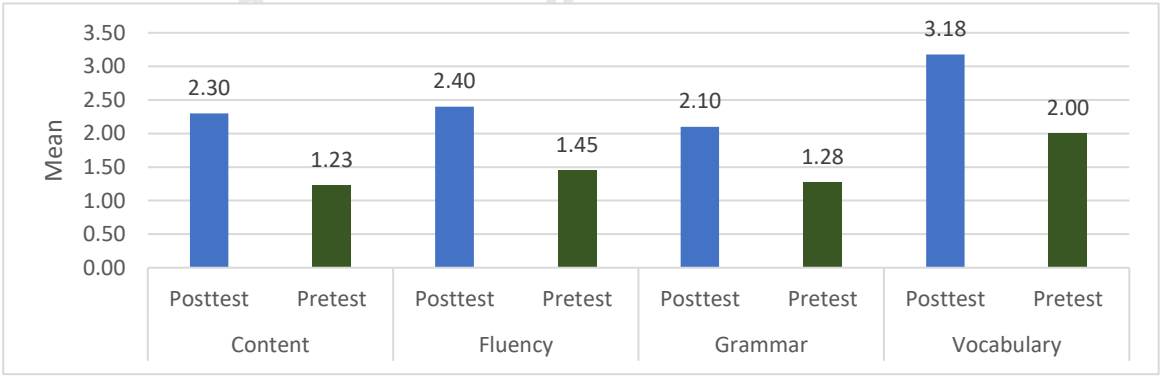


Figure 5 Comparison of mean scores in content, fluency, grammar, and vocabulary

Table 13 and Figure 5 illustrated that dialogic teaching in CLIL science could enhanced English oral communication ability in all four aspects significantly (p-value = 0.000). Vocabulary, content, and fluency (1.18, 1.08, 0.95) were aspects that students improved on the most whereas, grammar was the aspect that students improved the least (0.83)

Research Question 2: What are the opinions of third grade students of English program towards dialogic teaching in a CLIL Science subject?

To explore the opinions of third grade students of English program towards dialogic teaching in CLIL Science subject, semi-structured interview was conducted by the researcher. Six participants were randomly selected based on the pretest and the posttest scores. Specifically, two students were selected from the low performance, two students were selected from the middle performance, and two students were selected from the high-performance groups. The researcher coded interviewees using letters and numbers. To illustrate, L stands for low performance, M stands for middle performance and H stands for high performance. The data derived from content analysis indicated that most students had positive opinions toward dialogic teaching in CLIL Science. Specifically, students reported an enjoyable learning experience with added benefit of improving CLIL Science content comprehension and increasing opportunities to use English oral communication.

Satisfactory

Satisfactory was one of the themes emerged. This theme consisted of an enjoyable learning experience, helpfulness in CLIL Science content comprehension and helpfulness in enhancing opportunities to use English oral communication.

Students expressed satisfactions towards dialogic teaching in CLIL science. Specifically, they found dialogic teaching in CLIL to be an enjoyable learning experience. Examples of excerpts are as shown below,

L1: "หนูชอบเพราะมันสนุกเวลาที่เราได้คุยกัน หาคำตอบแล้วก็ช่วยกันตั้งคำถามค่ะ"

"I like because it was fun to interact, look for answers and come up with questions together".

M2: "ผมชอบเรียนแบบนี้เพราะเราไม่ต้องนั่งฟังคุณครูตลอดเวลา ผมกับเพื่อนๆได้คุยกัน ถามกัน แล้วก็ ตอบคำถามกันครับ"

"I like to lean this way because my classmates and I didn't sit and listen all the time, instead, we talked, asked and answers questions together to learn".

H1: "ผมชอบเรียนแบบนี้ เพราะมีอะไรทำตลอดเวลา เช่น พูดคุย ได้ตอบคำถาม ถามคำถามกัน ตื่นเต้นดี ครับ"

"I like to learn this way because there were things to do all the time such as having conversation and asking and answering. It made me feel excited".

Students also found dialogic teaching in CLIL science to help with content comprehension. Examples of excerpts are as shown below,

M1: "เรียนแบบนี้ทำให้หนูเข้าใจค่ะ เพราะคุณครูให้หนูคิด ให้หนูถามสิ่งที่ไม่รู้ ได้หาคำตอบด้วยกันเพื่อนๆและคุณครู"

"Learning this way made me understand the content because the teacher made me think, allowed me to ask and together with my classmates and the teacher, we found answers together".

H1: "เรียนแบบนี้ทำให้ผมเข้าใจเพราะผมได้ทำหลายอย่างที่ช่วยให้เข้าใจ เช่น ดูการ์ตูนเรื่อง The Hungry Caterpillar แล้วคุยกันว่าผีเสื้อเกิดมาจากอะไร แล้วตอนที่ไปที่สนามเด็กเล่น แล้วคุยกันว่าตอนเล่นมี forces อะไรบ้าง"

"Learning this way made me understand the content because I got to do many things that enhance my understanding. For examples, watching "The Hungry Caterpillar", then talked about a life cycle of a butterfly and going to the playground to play then talked about forces that occurred when playing at the playground".

H2: "เข้าใจค่ะเพราะคุณครู หรือ เพื่อนๆ จะถามคำถาม หรือ อธิบาย แล้วหนูกับเพื่อนๆ ต้องคิดอธิบายหาคำตอบที่ถูกด้วยกัน".

"I understood because the teacher or my classmates asked questions or explained information then we had to think, explain and find the answers together".

Moreover, students found dialogic teaching in CLIL science to enhance opportunities for English oral communication. Examples of excerpts are as shown below,

L1: "หนูคิดว่าหนูพูดภาษาอังกฤษมากขึ้นค่ะเพราะหนูต้องพูดภาษาอังกฤษเวลาอธิบาย ตอบคำถาม ถามคำถาม เพื่อนๆ กับคุณครู"

"I think I spoke English more often because I had to speak English when explaining, asking and answering questions to my classmates and my teachers"

M2: "ผมคิดว่าผมพูดมากขึ้นเช่นเวลา ตอบเพื่อนๆ ตอบคุณครู อธิบายเรื่องต่างๆที่เรียน ก็ต้องพูดภาษาอังกฤษหมดเลยครับ"

"I think I spoke English more. For examples, I had to use English when I answered my classmates and my teacher as well as when I explained things".

H1: "ผมพูดภาษาอังกฤษมากขึ้นมากๆครับ เพราะเวลาเรียน ผมต้องพูดอธิบาย ต้องถามคำถามตอบคำถามเป็นภาษาอังกฤษตลอด"

"I spoke English more often because I had to explain, ask and answer questions in English during the lessons".

Nevertheless, a few students had also reported that due to the unfamiliarity, dialogic teaching in CLIL Science was, initially, a challenge for them.

Unfamiliarity

Unfamiliarity was another theme emerged from content analysis. This theme consisted of challenging towards the instruction due to unfamiliarity.

Students expressed some initial concerns towards dialogic teaching in CLIL science. Specifically, they were unfamiliar with the instruction, which led to some

challenges in the beginning of their learning with the instruction. Examples of excerpts are as shown below,

L1: "เข้าใจบ้างไม่เข้าใจบ้าง หนูพยายามตั้งใจฟังเวลาเพื่อนๆ พูดแต่บางทีก็ไม่เข้าใจ แต่เวลาคุณครูอธิบายหนูเข้าใจมากกว่า"

"I did not always understand when my classmates explained but always, I understood when my teacher explained".

L2: "ตอนแรกๆ ผมอยากตอบ อยากพูดต่อจากเพื่อน แต่ไม่กล้าเพราะไม่รู้ว่าต้องเริ่มยังไงครับ"

"In the beginning, I wanted to answer or speak after my classmates, but I did not dare because I did not know how".

M1:" ตอนแรกหนูคิดว่ามันยาก เวลาที่ต้องพูดต่อจากเพื่อน หรือ คุณครู เพราะต้องตั้งใจฟังมากๆ ไม่งั้นจะพูดผิด แต่พอหนูพูดบ่อยๆ มันก็ไม่ยาก"

"At first, I thought that speaking after my classmates or my teacher' turn was difficult because I had to listen very carefully, or I would be wrong. However, the more I spoke, the easier it got".

Summary of Findings for Research Question 2

The summary of students' opinions toward dialogic teaching in CLIL science were as illustrated in table 14.

Table 14 Summary of findings for research question 2

Satisfactory towards dialogic teaching in CLIL Science	**Frequencies**
1. It was fun	1
2. like to learn this way	2
3. It was excited	1
4. Understand the content	4
5. Spoke more English	5
Unfamiliarity towards dialogic teaching in CLIL Science	**Frequencies**
1. Did not know what to do	1
2. It was hard because of unfamiliarity	1
3. Did not understand (confused)	1

Summary

In answering the first research question, the statistical results as aforementioned demonstrated that dialogic teaching in CLIL science enhanced English oral communication ability in all four aspects significantly (p-value = 0.000). Specifically, vocabulary, content, and fluency (1.175,1.075, 0.950) were aspects that students improved on the most whereas, grammar was the aspect that students improved the least (0.825).

In answering the second research questions, the content analysis as aforementioned demonstrated satisfactory opinions towards with dialogic teaching in CLIL science as they found it to be an enjoyable learning experience, helpful in CLIL science content comprehension and help in increasing opportunities to orally communication in English. Though, initially, a few students found dialogic teaching

in CLIL science to be unfamiliar, which caused difficulty in learning. However, they felt less challenged by the instruction once they became more familiar with the learning process eventually.

Chapter 5

Summary, Discussions and Recommendations

This chapter presents a summary of the study, a summary of findings, and a discussion of the findings.

5.1 Summary of the Study

The objectives of the study were 1) to investigate the effects of dialogic teaching in CLIL Science subject in enhancing English oral communication ability of third grade students of English program and 2) to investigate the opinions of third grade students of English program towards dialogic teaching in CLIL Science subject. This study employed a one group pretest-posttest research design. The participants in the study were forty third grade students who studied in the English program of Jirasartwitthaya School in Phra Nakorn Sri Ayutthaya, Thailand in the second semester of the 2020-2021 academic year. The participants were selected based on convenience sampling.

The study was divided into two phases. The first phase was the development of instructional and research instruments. The instructional instruments were content, materials, unit plan and lesson plans. The research instruments were pretest, posttest, analytic rubric score and interview questions. The content in CLIL Science were based on the revised version of Basic Education Core Curriculum B.E. 2560 (2017). The materials include Targeting Science Primary 3 textbook and other instructional materials, including videos. The lesson plans were constructed as dialogic teaching in CLIL Science lesson plans in which 4Cs framework of CLIL shaped the learning

outcomes and five principles of dialogic teaching shaped the interactions in the lessons. The research instruments in the study were pretest, posttest, analytic rubric score, and interview questions. The pretest and posttest were parallel CLIL Science Question Cards that aimed to evaluate students' English oral communication ability. The aspects of investigations were content, fluency, vocabulary, and grammar. As for the analytic rubric score, it was adapted from TOEFL Junior Speaking Score Guide (Educational Testing Service, 2018) in speaking-listening task. The interview questions aimed to seek students' opinion towards dialogic teaching in CLIL Science subject. The interviews were done through semi-structured interview.

The study was carried out for the total of 11 weeks. The first week was the administrator of pretest and the eleventh week was the administrator of posttest and interview. In saying that, the second to the tenth week were when ten dialogic teaching CLIL Science lesson plan were implemented to forty third grade English program students.

To investigate the effects of dialogic teaching in CLIL Science subject in enhancing oral communication ability, the data obtained from the pretest and posttest were statistically analyze using a paired sample t-test to compare the differences in students' English oral communication ability, overall and in four investigated aspects. Furthermore, to explore students' opinions toward dialogic teaching in CLIL Science, data from the semi-structured interview were analyzed using a content analysis in which themes emerged from the data.

5.2 Summary of Findings

The major findings of this research study were summarized in two sections according to the research questions. The results were as follows:

5.2.1 The effects of dialogic teaching in CLIL Science in enhancing English oral communication ability of third grade students of English program.

From the quantitative data analysis of the differences between mean scores of the pretest and posttests of English oral communication ability, students' English oral communication ability increased significantly (p-value is 0.000) after the implementation of dialogic teaching in CLIL Science. Moreover, the difference of mean scores on the pretest and posttest was 4.10 meaning that posttest scores increased on the average of 4.10 points. The t-value was 22.994, which statistically indicates that dialogic teaching in CLIL science enhance English oral communication ability significantly. Furthermore, when examining four aspects in the study, vocabulary, content, and fluency were the aspects that students improved on the most whereas, grammar was the aspect that students improved on the least.

5.2.2 Opinions of third grade students of English program towards dialogic teaching in CLIL Science

From the qualitative data analysis on the opinion of third grade students of English program towards dialogic teaching in CLIL science, two themes namely: satisfactory and unfamiliarity emerged from conducting a content analysis. Students reported satisfactory opinions as they expressed learning through dialogic teaching in CLIL science to be enjoyable, helpful in understanding content, and in increasing opportunities for English oral communication. Nevertheless, a few of students found

dialogic teaching in CLIL science to be unfamiliar, which caused difficulty in learning. However, they felt less challenged by the instruction once they became more familiar with the learning process eventually.

5.3 Discussion

The present study was conducted to 1) to investigate the effects of dialogic teaching in CLIL Science subject in enhancing English oral communication ability of third grade students of English program and 2) to explore the opinions of third grade students of English program towards dialogic teaching in CLIL Science subject. The results of the study are discussed in two aspects: students' English oral communication ability and students' opinions toward the instruction. The discussion is indicated as follows.

5.3.1 Students' English oral communication ability

The finding from the quantitative data analysis indicated that dialogic teaching in CLIL Science increased students' English oral communication ability significantly (p-value = 0.000). Specifically, after the implementation of dialogic teaching in CLIL Science, students' English oral communication ability posttest mean scores were significantly higher than their pretest mean scores. The finding was consistent with recent previous studies (Van der Veen et al., 2017; Van der Veen, Michaels, Dobber, Van Kruistum, & Van Oers, 2021; Van der Wilt et al., 2021). The finding can be explained as follows.

First, English oral communication ability increased after the implementation of the instruction because students were provided with sufficient opportunities to use English oral communication in dialogic interactions. Specifically, five key principles

of dialogic teaching (Robin Alexander, 2010; Robin Alexander, 2018) were implemented in all teaching phases, which shaped interactions between students and the teacher to be dialogic. First, in the initiation phase, students were encouraged to join the dialogic interactions by sharing their prior knowledge on the subject matter. The dialogic interaction in this phase was not only to activate students' prior knowledge but also activate students' engagement for all the upcoming dialogic interactions. Then, in the inquiry phase, students were encouraged to join the dialogic interaction by discussing the possible hypothesis based on the question posted. After, students were encouraged to interact collectively with the teacher to build new knowledge on the subject matter. Finally, in the reviewing phase, students were encouraged to join the dialogic interaction by using the new knowledge co-constructed previously to address the answer to the question posted and to check on the hypothesis. Throughout dialogic interactions, the teacher was the facilitator who provided scaffolds via sentence stems, talk moves, follow-up questions and visual aids. The role of the teacher was as suggested by Reznitskaya et al. (2009) in that teachers in dialogic teaching are to be facilitators who support dialogic interactions via appropriate talk moves that lead to learning. Moreover, dialogic interactions were corresponded with the Theory of Dialogism and the Theory of Learning proposed by Mikhail Mikhaĭlovich Bakhtin (2010) and Lev Semenovich Vygotsky (1980) in that students' cognition and language could be developed from active participation in classroom interactions.

As aforementioned, the finding was consistent with the finding revealed in the studies of Van der Veen et al. (2017); Van der Veen et al. (2021); Van der Wilt et al. (2021) in regard that dialogic interactions could improve young learners' oral

communication ability when young learners were regularly encouraged to not only orally express their thoughts but also actively listen to peers and the teacher during the interaction.

Next, vocabulary was the aspect of English oral communication ability that students demonstrated the most improvement on after the implementation of the instruction. This could be the result of CLIL being content and language focused (Dorothy Coyle et al., 2010) and 4Cs framework, proposed by Do Coyle (2007), being learning outcomes. As a result, dialogic interactions were content driven; hence, led to an improvement of vocabulary knowledge. Specifically, students' vocabulary was increased from frequent exposures and meaningful usages of content specific vocabulary in dialogic interactions for new knowledge co-construction. For example, in studying the life cycle of a butterfly, students were exposed to content specific words about the butterfly life cycle as well as words used in explaining the life cycle. Then, students were encouraged to use these words to co-construct knowledge about the life cycle of a butterfly with peers and the teacher. When students were provided with sufficient exposure to content specific vocabulary as well as sufficient opportunities to use these words in information exchanges, their vocabulary knowledge increased. With reference to an increase in vocabulary knowledge as a result of dialogic interactions, the finding was consistent with the finding revealed in the study of Chow et al. (2021), which indicated that students' expressive vocabulary knowledge improved because students were provided with ample opportunities to use words during dialogic interactions. Finally, regarding an increase of vocabulary knowledge as a result of CLIL, the finding was consistent with Huang (2020)'s study in that CLIL could enhance the science vocabulary size of young learners.

5.3.2 Students' opinions towards the instruction

The findings from the qualitative data analysis indicated that most students reported positive opinions toward dialogic teaching in CLIL science. The finding can be discussed as follows.

After the implementation of dialogic teaching in CLIL Science lessons, opinions of the students toward the instruction were found to be mainly satisfied. Students reported that the instruction was enjoyable and helpful in promoting content comprehension and increasing opportunities to use English for oral communication.

First, dialogic teaching in CLIL Science was reported to be an enjoyable learning experience because the interactions kept students actively involved in the learning process by enabling them to share their outputs, including thoughts and questions. An example excerpt was as shown below,

H1: "ผมชอบเรียนแบบนี้ เพราะมีอะไรทำตลอดเวลา เช่น พูดคุย ได้ตอบคำถาม ถามคำถามกันตื่นเต้นดีครับ"

"I like to learn this way because there were things to do all the time such as having conversation and asking and answering. It made me feel excited".

Second, dialogic teaching in CLIL Science was reported to be helpful in promoting content comprehension. This was because dialogic interactions were content-driven, so conversation amongst students and the teacher were to co-construct knowledge as means of achieving learning outcomes. An example excerpt was as shown below,

M1: "เรียนแบบนี้ทำให้หนูเข้าใจค่ะ เพราะคุณครูให้หนูคิด ให้หนูถามสิ่งที่ไม่รู้ ได้หาคำตอบด้วยกันเพื่อนๆและคุณครู"

"Learning this way made me understand the content because the teacher made me think, allowed me to ask and together with my classmates and the teacher, we found answers together".

Third, students reported that dialogic teaching in CLIL Science was helpful in increasing opportunities to use English to orally communicate; hence, led students to feel that their English oral communication ability had improved. An example excerpt was as shown below,

L1: "หนูคิดว่าหนูพูดภาษาอังกฤษมากขึ้นค่ะเพราะหนูต้องพูดภาษาอังกฤษเวลาอธิบาย ตอบคำถาม ถามคำถาม เพื่อนๆ กับคุณครู"

"I think I spoke English more often because I had to speak English when explaining, asking and answering questions to my classmates and my teachers."

The finding was consistent with the finding revealed in the study of Black (2005) in the aspects of enjoyment and knowledge improvement as dialogic interactions allowed conversations to be collective between students and the teacher. This helped increase participation in sharing outputs. Consequently, dialogic interactions was found to be enjoyable and helpful in constructing knowledge.

Finally, it should also be addressed that a few students had reported that due to unfamiliarity toward the instruction, they had faced some difficulties in the beginning.

However, students overcame the feeling of unfamiliarity overtime as they were encouraged to participate in more dialogic interactions as well as received more supports from the teacher.

In summary, dialogic teaching in CLIL Science could enhance students' English oral communication ability due to sufficient opportunities provided for students to orally communicate in English for their learning. Furthermore, dialogic teaching in CLIL was reported to be an enjoyable and helpful instruction method that can effectively help develop content and English language skills.

5.4 Limitation of the study

Although this study has successfully achieved its objectives, some limitations were found as discussed below,

First, the present study was carried out in a short period of time (10 weeks of instructions). Thus, to gain further insights and perspectives on the effectiveness of dialogic teaching in CLIL Science, time allotment could be extended. Next, the participants were English program students in one grade level who were conveniently selected. Therefore, cannot be generalized onto population groups that do not share the same characteristics of the participants in this study.

5.5 Pedagogical Implications

The findings of the present study could suggest the pedagogical implications for the teachers as follows,

First, it is important for the teachers to be aware of students' English oral communication ability. Dialogic teaching focuses on student-centered in which students' active participations in knowledge co-construction with peers and the

teacher in dialogic interactions lead to knowledge attainment. Therefore, in knowing students' level of English oral communication ability, the teachers can prepare appropriate scaffolding strategies to maximize students' involvements in the dialogic interactions, which lead to cognition and language development. As mentioned by Reznitskaya et al. (2009), the role of the teachers is to facilitate the dialogic interactions through various scaffolding techniques including probing response, follow-up questions and feedbacks. Furthermore, dialogic interactions should be implemented as teacher-led interactions then gradually turn into students-led interactions. As suggested by Muhonen et al. (2016), dialogic interactions in dialogic teaching lessons can be teacher-led or students-led interactions depending on various factors such as learning contexts and students' language proficiencies.

Second, it is important for the teacher to study the mechanism of the five key principles of dialogic teaching as well as CLIL and its 4Cs framework. In regarding the five key principles of dialogic teaching, the teachers need to develop an understanding of the principles and how they can be implemented to bring students' voices for learning purposes during dialogic interactions. As stated by Robin Alexander (2010), classroom interactions are dialogic when the five key principles are reflected. In regarding CLIL and its 4C's framework, the teachers need to also develop an understanding of 4Cs elements and how they should be implemented for content knowledge and language developments. As suggested by San Isidro (2018), language drives the learning in CLIL and language is attained via interactions on the subject matters. Thus, students should be encouraged to use the language in acquiring content knowledge, so that in the end, both content and language outcomes are achieved.

5.6 Recommendations for future research

The finding of the present study created the recommendations for future research as follows.

First, with time limitation in the present study, it is recommended for future researchers to conduct a longitudinal study to observe the effects of dialogic teaching in CLIL Science over time. Second, apart from the data derived from the semi-structured interviews, it is recommended for future researchers to gather data from classroom observations or students' written feedback to support the data from the interview. Third, it is recommended for future researchers to conduct a study with other grade levels participants who study in English program or programs that are similar in characteristics to further explore the effectiveness of dialogic teaching in CLIL Science. Finally, it is recommended for future researchers to investigate the effectiveness of dialogic teaching in CLIL Science towards affective factors in Second Language Acquisition, such as, willingness to communicate and anxiety, to gain deeper insights into dialogic teaching in CLIL Science.

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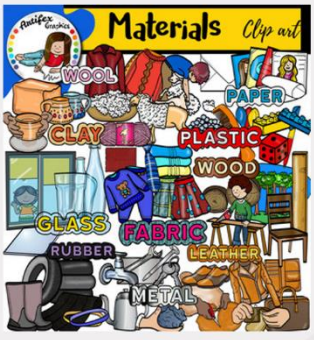
Appendices

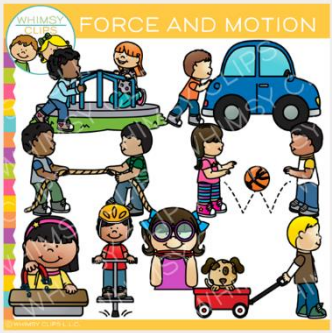
Appendix A: Pretest

Instructions:

1. Ask a student to select one topic from the following,
   - Living things vs. Nonliving things
   - Life cycles
   - Materials
   - Forces
2. Ask a student to select one of the two question cards under a selected topic
3. Reveal the question on the selected question card
4. Ask a student to read aloud the question presents. If needed, read a question aloud to a student.
5. Ask a student to respond to the question in English. If needed, ask follow-up question for elaboration purpose.

Topic Cards





Pretest Question Cards

Life Science
Card #1 Living Things vs. Non-Living Things

Q1.
How do you know that a dog is a living thing ?

Life Science
Card #2 Living Things vs. Non-Living Things

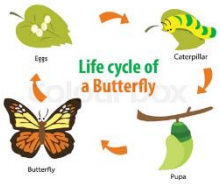
Q2.
A bike is moving. How do you know that a bike is a non-living thing ?

Life Science
Card #3 Life Cycle

Q1.
How does a butterfly grow?

Life Science
Card #4 Life Cycle

Q2.
How do you protect a life cycle of a butterfly?

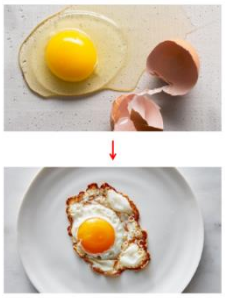


Physical Science
Card #5 Materials

Q1. Why is paper not a good material to make an umbrella ?

Physical Science
Card #6 Materials

Q1. How do you make a fried egg from a raw egg ?



Physical Science
Card #7 Forces

Q1. How does a girl move on the swing ?

Physical Science
Card #8 Forces

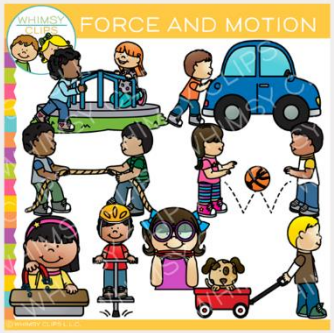
Q2. How can the red team win tug of war ?

Appendix B: Posttest

Instructions:

1. Inform a student that a topic of posttest is the same as a topic selected from pretest
2. Inform a student that a question of posttest is similar to a question from pretest
3. Reveal the question
4. Ask a student to read aloud the question presents. If needed, read a question aloud to a student.
5. Ask a student to respond to the question in English. If needed, ask follow-up question for elaboration purpose.

Topic Cards



Posttest Question Cards

Life Science

Card #1 Living Things vs. Non-Living Things

Q1.

How do you know that a cat is a living thing ?

Life Science

Card #2 Living Things vs. Non-Living Things

Q2.

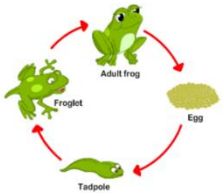
A skateboard is moving. How do you know that a skateboard is a non-living thing?

Life Science

Card #3 Life Cycle

Q1.

How does a frog grow ?

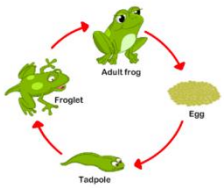


Life Science

Card #4 Life Cycle

Q1.

How do you protect a life cycle of a frog?



Physical Science

Card #5 Materials

Q1. Why is cloths not a good material to make an umbrella ?

Physical Science

Card #6 Materials

Q2. How do you make chocolate bars chocolate sauce ?

Physical Science

Card #7 Forces

Q1. How does a boy go down a slide ?

Physical Science

Card #8 Forces

Q2. How can the boy get to the top of the brick wall ?

Appendix C: Analytic Rubric Score for English oral communication

	4	**3**	**2**	**1**
Content	Shows a **full** understanding of the topic by expressing correct **and** sufficient key information	Shows a **good** understanding of the topic by expressing correct **but** leaving out **a few** key information	Shows a **limited** understanding of the topic by expressing correct **but** leaving out **most** key information	Shows **no** understanding of the topic by expressing incorrect information **and/or** leaving out **all** key information
Fluency	Expresses information smoothy, with **little** hesitation, which do not interfere with utterances	Expresses information with **some** hesitations, which do not interfere with utterances	Expresses information with **some** hesitations, which slightly interferes with utterances	Expresses information with **a lot of** hesitations, which greatly interferes with utterances
Grammar	Expresses information with **all** correct basic grammar structures	Expresses information with **most** correct basic grammar structures	Expresses information with **some** correct basic grammar structures	Expresses information with **little** correct basic grammar structures
Vocabulary	Shows a **full** understanding of vocabulary on the topic by using **all** correct vocabulary	Shows a **good** understanding of vocabulary on the topic by using **most** correct vocabulary	Shows a **limited** understanding of vocabulary on the topic by using **a few** correct vocabulary	Shows **no** understanding of vocabulary on the topic by using **incorrect** vocabulary

Appendix D: Dialogic teaching CLIL Science Lesson Plan

Week: 2 **Unit:** 1 The Lives of Humans and Animals

Lesson: 1 Basic Needs of Humans

Time Allocation: 60 minutes

Learning Standard: Standard SC 1.2: Describe necessitates for human and animals to live and grow from collect data.

4Cs Learning Outcomes

<table>
<tr><td colspan="3">Content</td><td>Cognition</td></tr>
<tr><td colspan="3">- Basic needs for human are: Food, Water, and Air.
- Importance of Food, Water and Air:
o Food and water give nutrients and energy for human to live and grow
o Air gives oxygen for human to breathe so they can live and grow</td><td>- Hypothesize about humans’ basic needs
- Discuss about basic needs of human and why they are important</td></tr>
<tr><td colspan="3">Communication</td><td>Culture</td></tr>
<tr><td>Language of learning:
- Basic needs
- Live
- Grow
- Food
- Water
- Air
- Nutrients
- Energy
- Oxygen</td><td>Language for learning:
- The basic needs for human are ….
- Food and water give….
- Air gives…</td><td>Language through learning:
- Language emerges during dialogic interactions and oral presentation</td><td>- Recognize various types of rice from different parts of the world</td></tr>
</table>

Phases / Time	Dialogic Teaching Principles	Teacher	Students	Materials
Initiation Phase 15 Mins.	Supportive Reciprocal Collective Cumulative Purposeful	(Students and teacher sit in a circle) - Greets students - Displays and explain how and when to use sentence stem in dialogic interaction. Sentence stems are as follow, 1. …… needs…... the most 2. …… needs …... the most because …... 3. I agree with …... because …... 4. I disagree with …... because …… 5. How do you know? <u>Probing students' pre-conceptions about humans' needs</u> - Displays 4 posters (one at a time) - Read the questions and choices aloud to students - Asks students to share their answers aloud using sentence stem #1 - Asks students to explain their rationale using sentence stem #2	(Students and teacher sit in a circle) - Greets the teacher - Read and understand when to use sentence stems when responding in dialogic interaction <u>Probing students' pre-conceptions about humans' needs</u> - Look at posters - Look and listen to the questions and choices - Using sentence stem #1 and #2 to share the answer and the rationale aloud - Using sentence stem #3 and #4 to agree or disagree and why - Asking question using sentence stem #5	Posters for probing pre-conceptions Poster: sentence stems

		- Asks students who agree to explain why they agree using the sentence stem #3 - Asks students who disagree to explain why they disagree using the sentence stem #4 - Encourages students to ask each other to explain their rationale using sentence stem #5		
Inquiry Phase 20 Mins.	Collective Cumulative Purposeful	(Students and teacher sit in a circle) <u>Question of the day</u> - Post the question "What are the basic needs of humans?" - Read the question aloud <u>Hypothesis (make educational guess)</u> - Asks students to hypothesize the basic needs of human - Writes a hypothesis shared by students on the board and tells students that we will come back to check on them later - Displays and explains how to use sentence stems in the dialogic interactions. The sentence stems are as follow, ▪ Same as …… , I …….. ▪ I also do them / it because …. ▪ I also think it/ they are important because	(Students and teacher sit in a circle) - Read the question - Hypothesize the basic needs of human and animals and share aloud - Read and understand when to use different sentence stems when responding in dialogic interaction	Poster: question of the day Poster: sentence stems

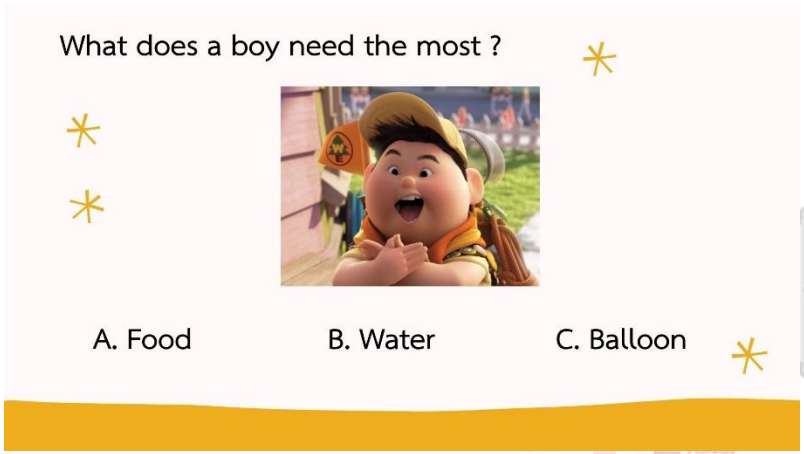
		…. ▪ I agree with …... because …. ▪ I disagree with …... because …. ▪ I want to add that …. <u>Dialogic interaction</u> <u>(teacher-students dialogic interaction)</u> - Discusses morning routine / activities with students - Encourages students to join the dialogic interaction using the following questions in addition to sentence stems, ▪ What do you do before you come to school? ▪ Why do you do them/ it? ▪ How is/are they important? ▪ What would happen to you if you don't do them / it? ▪ Can you explain more? ▪ Which is of the routines / activities are most needed? ▪ Why do you think so? - Displays these questions and encourages students to use them when joining the dialogic interaction - Discusses after school routine / activities with students - Encourages students to join the dialogic interaction using the same questions and	- Join teacher-students dialogic interaction using sentence stems #1-#5	Poster: Questions

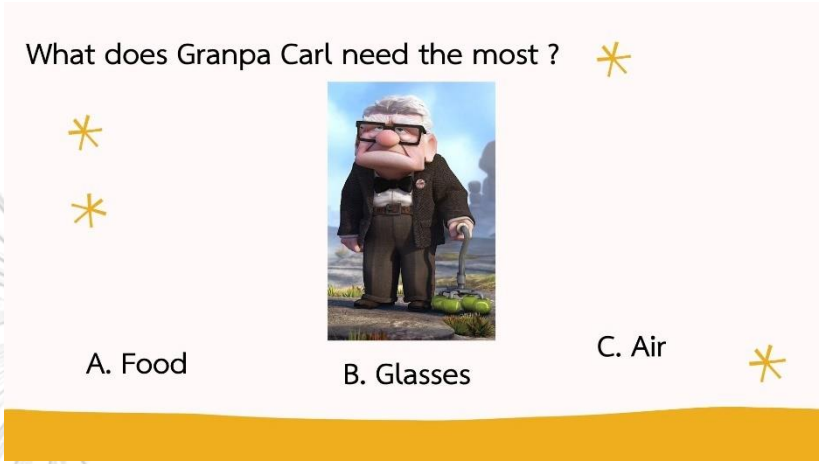
		sentence stems - Displays these questions and encourages students to use them when joining the dialogic interaction		
Reviewing Phase 15 Mins.	Supportive Reciprocal Collective Cumulative Purposeful	- Discusses with students about the 3 basic needs for human using information shared from the previous dialogic interactions and these questions, 1. From what we shared together, what are the 3 routines/activities that are most needed to live and grow? 2. How are they important for living and growing? - Draws a conclusion about humans' basic needs by sharing and explaining about the 3 basic needs of human from the poster - Revisits and checks hypothesis made <u>Culture</u> - Shares with students that there are various types of rice from different parts of the world - Share with students that rice is main source of food. Hence, rice is the basic needs for	- Join the dialogic interaction using appropriate sentence stems - Understand that Food, Water and Air are basic needs for human - Understand that food and water give nutrients and energy for human to live and grow - Understand that air gives oxygen for human to breathe so they can live and grow - Revisit and check the hypothesis made - Understand that there are various types of rice from different parts of the world - Understand that rice is food and is the basic needs for humans in various parts	Posters: the 3 basic needs of humans Posters: Rice the world (culture)

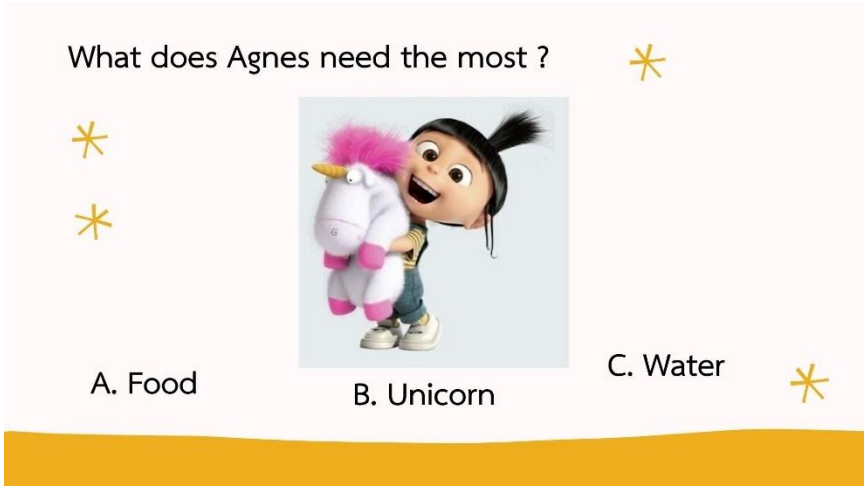
		humans in various parts of the world	of the world	
Assessment 10 mins.		<u>3 basic needs of your family member</u> - Asks students to draw one of their family members then be ready to share aloud the 3 basic needs of the selected family member and why they are important for living and growing - Tells students that they can be as specific as to the kind of food and the kind of drink. - Give a few minutes for students to draw their family members and get ready to share aloud - Goes to each student and listen to a student sharing aloud the 3 basic needs of their selected family member. Example: The basic needs of Winnie the Pooh are	- Draw one family member on a clean sheet of paper - Share aloud 3 basic needs and why they are important for living and growing	

Materials

Posters for probing pre-conceptions

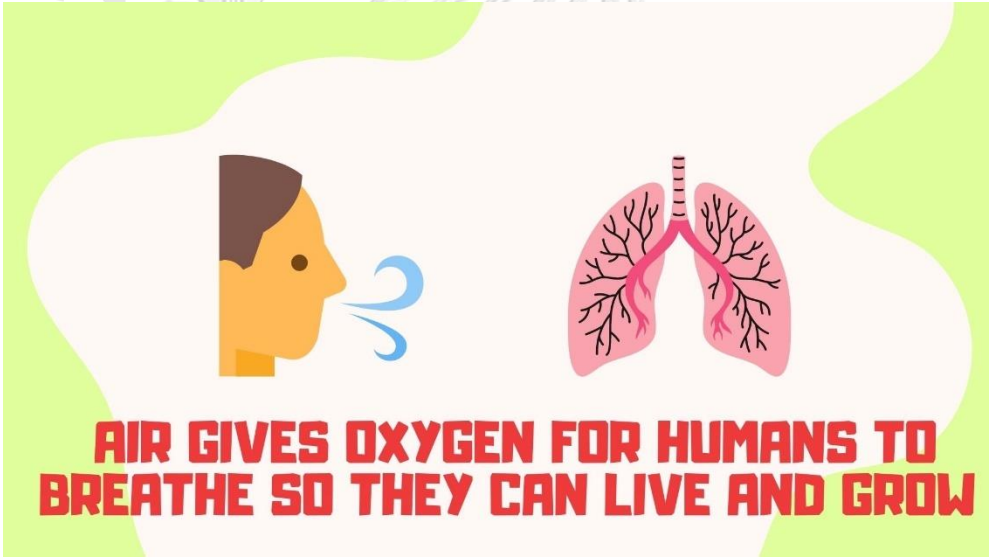




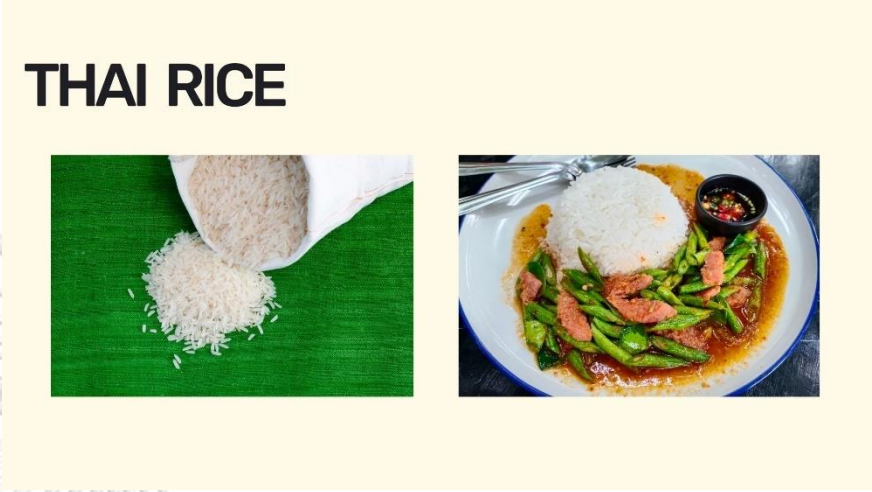


Poster: Question of the day

Posters on the 3 basic needs for human



Posters of rice from different parts of the world



Poster: Sentence Stems (Initiation Phase)

Poster: Sentence Stems (Inquiry Phase)

Poster: Questions (Inquiry phase)