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CLIL In Senior High School: Empowering English Language Teaching and Learning in Merdeka Curriculum

Muhammad Kholili[1], Sri Rachmajanti[2], Anik Nunuk Wulyani[3]
[1,2,3]Universitas Negeri Malang, Indonesia

[1]muhammad.kholili.2002217@students.um.ac.id

Abstract

Content and Language Integrated Learning (CLIL), is an approach that focuses on both content and language learning. The research design was a mixed method, Exploratory Sequential Research, which combined quantitative and qualitative research. A total of 71 students in one of the senior high schools in Gresik, East Java participated as research participants. They consisted of 39 students in the experimental group and 32 students in the control group. The results showed that there was a significant effect of CLIL on students' learning achievement in Merdeka Curriculum. The first theme used to determine students' initial experience. The research showed that students initially had difficulties in understanding biology concepts and using English academically. However, CLIL proved to be engaging and motivating, improving content understanding as well as language skills. Students were able to express complex biology concepts better, although challenges in academic writing and communication remained. They reflected on the need for real-world based learning and additional English lessons. Positive experiences in CLIL classes also encourage self-regulation for academic and career development.

Keywords: CLIL, English Language Learning, Exploratory Sequential Research, Independent Curriculum.

Introduction

Due to the demands of an ever-changing, complex, and in chief globalized society, mastering more than two languages is on the rise. In an educational context, English is sometimes used across the curriculum to teach other subjects. One approach is called content and language-integrated learning (CLIL). According to Rachmajanti & Anugerahwati (2014), English learning has chances to develop and improving the excellence of secondary schools by adapting the design of the CLIL approach and by using English as the language instruction for subjects, mathematics, and science, for instance. However, Pladevall-Ballester (2016) has different opinions, saying that teachers usually do not want to use English because they lack language proficiency and CLIL principles. Skinnari & Bovellan (2016) argued that teachers worried that students might learn less content because they are learning other languages. It can be said that there is a misunderstanding of using English in the teaching and learning process as English is not the student's first language. Besides, some researchers (Tanner & Dale, 2015) explain that CLIL teachers are teaching the content subject through English and teaching both the language and content in the same portions. In addition, the role of teachers is to help learners focus on and practice the language of the subject contents. Yalçın et al (2020) stated despite the challenge faced by teachers, their experiences in CLIL sustained them to become more competent in the language and the language of the content subject.

CLIL is also believed by some researchers to be one of the effective approaches to be carried out in EFL classes. Soler et al (2016) found that teacher and students in CLIL shared their positive vibes; the students improved their vocabulary, receptive skills, and productive

skills in English. Meanwhile, Nikula et al (2016) sees an opportunity to reflect upon the idea of learning through interactive writing. However, the classes are still conducted and focused on English.

In other content, Caravaca (2019) found that CLIL successfully intervened in students' interactions, critical thinking, and knowledge of the economy. Furthermore, Yalçın et al (2020) believe that the CLIL approach enables students to enhance their language proficiency to communicate and present the material meaningfully. Cossu & Brun (2021) also found a meaningful integration that its integration developed students' critical thinking for discussion and reflection. CLIL has been proven to benefit students' learning at different levels of education across the curricula in Indonesia. Rachmajanti & Anugerahwati (2019) stated that EMI, implemented in the CLIL program, provided students with excellent proficiency, literature competency, and critical thinking in not only ESL subjects but also math and science subjects. They suggested future research to examine the implementation of English as the language instruction and CLIL in the current Indonesian curriculum to empower educational improvement.

In addition, qualitative research examined the feasibility of CLIL approach implementation in the Indonesian Education system, conducted by Affandi & Nurfadhilah (2023), suggested that CLIL can be used as one of the approaches in teaching Senior High School students in Indonesia. However, applying CLIL should consider some aspects that should be successfully implemented. Deswila et al (2020) found the efficacy of using CLIL across curriculum. However, the teaching and learning process did not suit the principle of CLIL since it was similar to the traditional teaching explanation strategy. Therefore, the research suggested that the principle of CLIL be implemented well. In Indonesia, some schools use English in educational processes (Hapsari, 2012), but they are not named bilingual schools and do not have CLIL programs. Hidayati (2016) found that teachers faced difficulties dealing with the content and the way of delivering the content in better English. Therefore, Lin (2016) suggested that language and content teachers collaborate in designing the lesson in CLIL.

Referring to that case, the Merdeka Curriculum developed by the Indonesian Ministry of Education, Culture, Research, and Technology to recover the educational process in Indonesia after suffering from Covid-19 gives educational practitioners the chance to do that. In other words, it allows schools to provide convenience for educational units in managing the implementation of the learning process (Nugraha, 2022). However, the curriculum is only applied by Sekolah Penggerak and SMK Pusat Keunggulan. These schools can develop their best practice for other schools by implementing such innovations in the learning process. Therefore, CLIL can be one of the choices that empower teaching and learning in Indonesia, especially in English language teaching.

Thus, this research is intended to investigate the significant effect of CLIL on students' learning achievement in the Merdeka Curriculum. Furthermore, it aims to investigate the students' experiences, challenges, and factors that influence their motivation in the learning process during the CLIL program. Hopefully, the research's result can provide both theoretical and pedagogical implications. Theoretically, it enriches the body knowledge of the CLIL approach and EFL language learning. Pedagogically, EFL teachers are also suggested to improve their knowledge of the CLIL approach and apply it in their classroom practices.

Method

This research used mixed-method research–explanatory sequential research design, which involved combining or integrating quantitative and qualitative research. According to Cresswell (2017), explanatory sequential research design is done by conducting quantitative research,

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analyzing the results, and then building on the results to explain them in more detail with qualitative design.

Therefore, this research was done in two phases. The first phase was done to obtain the quantitative data through quasi-experimental research with posttest only design to investigate whether CLIL significantly affected the students' learning achievement. The design was used posttest only similar to what true experimental research has to reduce the threats of testing, instrumentation, and regression. However, the participants were not randomly assigned into group, the participants were already in intact classes. Therefore, the design was quasi-experimental research with posttest only design. The second phase was conducting narrative inquiry research that studied the qualitative data of the participants' lives obtained from a typical participant as the representative of the group who actually could give real story about the students' initial experiences during the CLIL class, learning activities after joining CLIL class, and their evaluations and hopes for future CLIL.

The participants in quantitative research were chosen by using cluster random sampling form the population, the students in one of Senior High Schools in Gresik in the academic year 2022/2023 which consisted of 27 classes (9 classes for each grade) with a total number of 775 students. The cluster chosen was the eleventh graders who had '*Bahasa Inggris Tingkat Lanjut*' program and majoring in science. There are three classes, namely XI-1, XI-2, and XI-3. Students who were in XI-1 and XI-2 were chosen purposefully based on language teacher and biology teacher' suggestions as they had good English and Science knowledge in average. However, XI-3 consisted of 33 students was not recommended by both teachers because of the students were lack of English and low achievement in average of biology. Therefore, XI-1 consisted of 32 students was chosen as the control group and the XI-2 consisted of 39 students was the experimental group.

Meanwhile, the participant in qualitative research was chosen by using typical sampling, a student who had achieved higher posttest in the experimental group was chosen as the participant. Typical sampling is a kind of purposeful sampling that studies a participant for the purpose of making observations and drawing inferences about the entire population (Cresswell, 2017). She was called Jasmine–pseudonym name, who was believed could tell the experiences precisely.

The instruments of this research were posttest for gaining quantitative data, narrative frame and empty box to obtain qualitative data follow up with interview questions. This research used posttest only design to obtain quantitative data about the effect of CLIL on students' learning achievement in the *Merdeka* Curriculum. Therefore, the construction of posttest instrument test followed what Lin developed Lin (2016) which consists of consist of recall, application, and analysis of vocabulary, sentence and text. In the recall vocabulary, the students must recall the vocabulary of animal in the food web. The instrument was constructed with no provided words for students to choose. Students have to produce the words independently as it involves productive skills instead (Question 1). The application vocabulary is more cognitively challenging when compared to the recall vocabulary question because students should understand in which the process of biogeochemical cycle is designed and represented visually on the diagram in order to identify the name processes correctly. It requires some interpretation and application skills instead of just a direct factual recall (Question 5). This kind of task, the analysis vocabulary, asks students to write a number based on the criteria asked (Question 2). Students with basic English skills can receive linguistic support to help them engage in complex thinking tasks. Regarding the content, students inspect the number of food chains and how many animals are defined as predators or consumers.

The sentence category, students were asked to read the questions or provide their answers in complete sentences. There are two types of tasks in the recall sentence, namely multiple-choice questions (Question 3) and answer questions based on the text in one or more sentences (Question 4a). Meanwhile, question 4b asks students to apply sentences they understand from the phenomenon given to solve the question. In analysis sentences, the students are asked to look over sentences to answer the questions based on their knowledge achieved in the learning (questions 6 and 7).

The category of recall text, students are asked to understand and answer questions based on a given text (Question 9 a, b, and c). In the application text, students have to apply their understanding to apply their understanding of biogeochemical cycles to explain their importance in the ecosystem in a coherent text (Question 8). In the analysis text, students design or investigate a phenomenon and then write based on their knowledge about it (Question 10).

These frameworks were used to construct the posttest instrument test to gain the students' learning achievement consisting of 10 (ten) main numbers with 28 total of questions. The total marks for the test were 45. The purpose was used to obtain data on how successful the students were in fulfilling the objective of CLIL learning achievement, covering three content demands (Recall, Application, Analysis) and three language demands (Vocabulary, Sentence patterns, Text Types). The validity of the test was construct-validity because the test items are constructed by considering what students have learned in the CLIL meetings, followed by a 3x3 framework grid assessment design matrix by (Lin, 2016). The reliability was not tested as the test items were adopted from the International General Certificate of Secondary Education (IGCSE) test.

Table 1. Blueprints of Posttest Instrument

Content Demand	Language Demand	Indicator	Item numbers	Cognitive Level
Recall	Vocabulary	Students can independently recall and produce key terms related to the biogeochemical cycle without provided options.	1 (A-I)	C1
	Sentence	Students can identify the main function of a substance through multiple-choice questions.	3	C1
		Students can recall and describe information in one or two sentences.	4a	C1
	Text	Students can understand and answer questions based on a given text.	9a, b, c	C2
Application	Vocabulary	Students can understand and apply their knowledge to correctly identify processes in the biogeochemical cycle represented visually.	5 (B-F)	C3
	Sentence	Students can apply learned concepts to explain phenomena, such as calculating the extra volume of oxygen used.	4b	C3
	Text	Students can apply their understanding of biogeochemical	8	C3

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		cycles to explain their importance in the ecosystem in a coherent text.		
Analysis	Vocabulary	Students can analyze characteristics of food chains and categorize animals as predators or consumers based on given criteria.	2 (A-D)	C4
	Sentence	Students can apply their knowledge to synthesize information and deduce correct answers, potentially justifying their answers.	6, 7	C4
	Text	Students can design or investigate a phenomenon and write a report including explanations and conclusions.	10	C6

Narrative frame, according to Barkhuizen (2014), is a structured story template comprising a series of unfinished sentences and varying lengths of blank spaces. The utilization of narrative frame effectively enabled students to contextualize their experiences within the course and after the course (Hiratsuka, 2014). Moreover, Hiratsuka (2014) confirmed that it can help the researcher because it offers guidance in the structure and content of what should be written and to some extent limited the expected responses. Therefore, the frame should reflect the student's experiences chronologically to help the researcher retold the story that was insightful and fuller picture of the student's experiences during the CLIL program.

The participant was given a preliminary explanation about the purpose of the research and the inclusion of narrative frame. She was also instructed to fill in narrative frame using provided statement starters which were intended to assist her in recalling her experience effectively. The narrative frame was adapted from (Hiratsuka, 2018). The original version was a course evaluation instrument that helped students to write their impressions of the course and its impact on them. In addition, the data got assisted him to successfully reflect on the content of the course. The Idea was similar to this research narrative frame was used as a useful tool for eliciting the participant experiences in the course, impressions of it, and its impact. Hence, I followed the original version because the frame helped the students to make sense of their experiences in the course and those they imagined experiencing after the course in effective way. Additionally, the narrative frame could help me to engage in critical reflection on the CLIL teaching and learning process.

Anticipating the limitation of narrative frame as participant wants to write more and the researcher's accessible data, the empty box was included (Appendix 4) with appropriate prompts at the beginning and the end of the actual sentence-starter frames to write freely any additional information that wanted to share (Barkhuizen, 2014). The empty box also followed the narrative elements and was aimed to generate examples of problems and successes–real and imagined.

Semi-structured interview was conducted in this research that used in combination with narrative frames to obtain more deepen exploration of research participant's experiences in CLIL program as the Narrative frames was used as the initial exploration. There was two parts of interview. The first covered about participant's life history about involving in CLIL program in the experimental group, the contemporary experiences, and the reflection on the CLIL program

included her aspirations. The second was focused on making some clarification about unclear stories written in the narrative frames.

Referring to the research design, the design was explanatory sequential research design belonged to mixed-method research. The procedures of data collection were consisting of two phases. The first phase was begun with collecting and analyzing quantitative data through quasi-experimental research. The second phase was collecting and analyzing qualitative data. The following figure (Figure 2.1) figured the procedure of data collection.

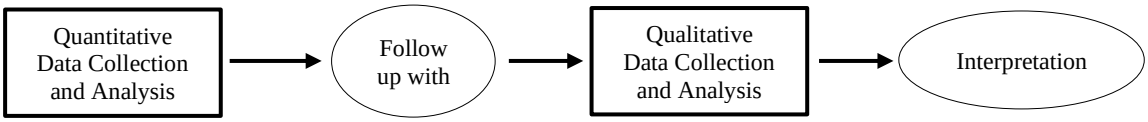


Figure 1. Mixed-Method, Explanatory Sequential Research Design
Source: Creswell, 2014:541

There are two types of data which are related to the research objective. The first was quantitative data in the form of posttest learning achievement scores. The data was analyzed and compared using the SPSS 27 version by implementing a paired sample t-test. The null hypothesis will be accepted if the significant value is more than 0.05. Therefore, it can be concluded that CLIL has no significant effect on students' learning achievement in the *Merdeka* Curriculum. However, if the sig. value ($p<0.05$), it means that the null hypothesis is rejected and the alternative hypothesis is accepted. In other words, it can be assumed that there was a significant effect of CLIL on students learning achievement in the *Merdeka* Curriculum.

The qualitative data is analyzed through the process of Narrative inquiry, based on narrative frames and interview through thematic analysis. Its results would support the result of quantitative data by retelling the students' experience and challenges during the CLIL process and describing what factors influence students learning through CLIL in the *Merdeka* Curriculum.

Results

To What Extend does CLIL significantly affect the students' learning achievement in the Merdeka Curriculum

This section highlighted the main findings of the current study with respect to the research question. The study aimed to investigate the effect of using CLIL on students' learning achievement in the *Merdeka* Curriculum. In order to answer the research question of the study, statistically analyses were carried out. Initially, the normal distribution of data had been checked as in Table 2.

Table 2. Tests of Normality of the Scores of CLIL Posttest

	Group	Shapiro-Wilk		
		Statistic	df	Sig.
Posttest Score	Experimental Group	.983	39	.819
	Control Group	.951	32	.154

Table 2 showed, sig-values for the posttest score of experimental and control groups was .819 and .154, respectively. The sig-values were more than 0.05, which met the normality assumption. In Table 3.2, descriptive statistics of Posttest results of learners who received CLIL instruction and non CLIL were provided.

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Table 3. Descriptive Statistics for Posttest of Experimental and Control Groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
Posttest Score	Experimental Group	39	37.90	3.144	.503
	Control Group	32	35.53	4.189	.741

Table 3, demonstrated the total number of the participants who did posttest. There were 39 participants in the experimental group and 32 participants in the control group. The posttest mean score of the experimental group was 37.90, while the mean score of the control group was 35.53. Thus, the posttest mean score of the experimental group was higher than the control group.The detailed information of the scores in the posttest was shown in Figure 2 for the experimental group and Figure 3 for the control group.

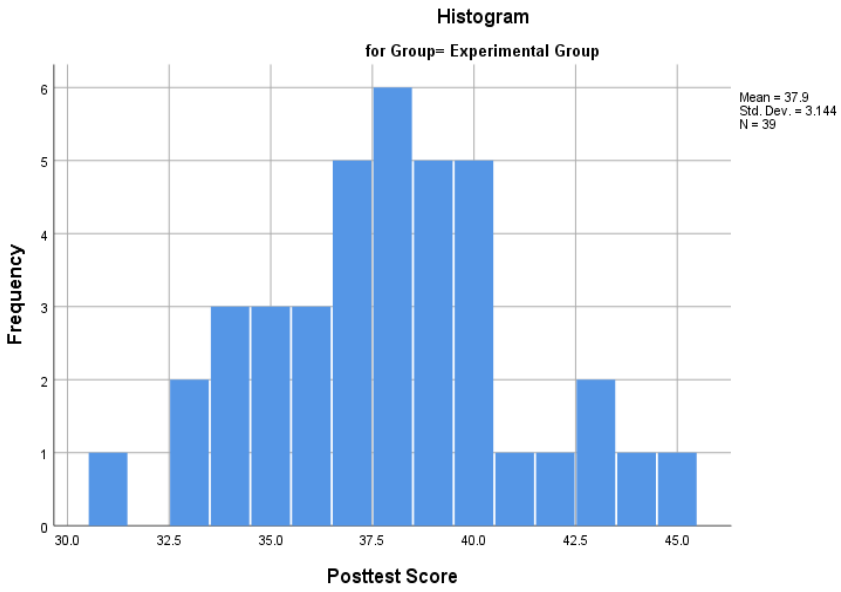


Figure 2. Posttest Score of the Experimental Group

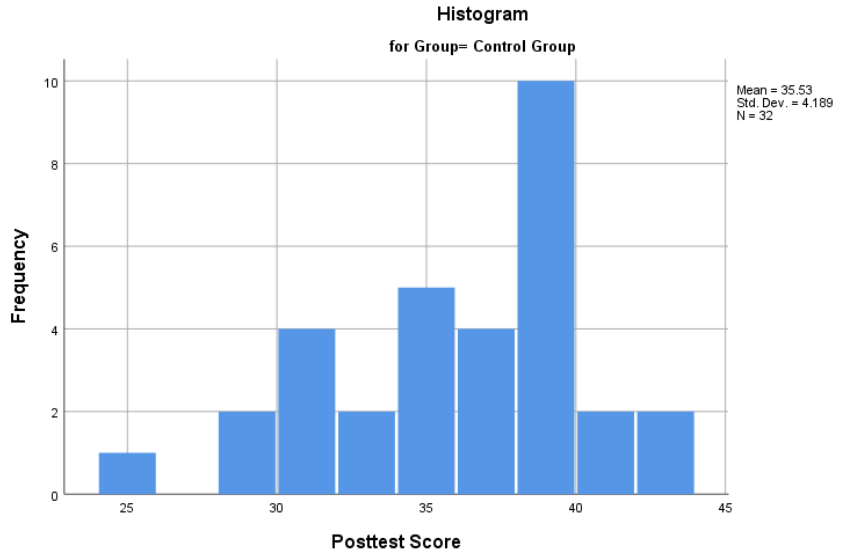


Figure 3. Posttest Score of Control Group

Figure 2 showed that the lower score the student get in experimental group for the posttest was 30 and the highest score got was 45. Most of students gained score in the range score of 36 to 40. In contrast, ten students in control group got score of 40 marks. In order to show whether there existed a significant difference between the groups' mean scores in the posttest, independent sample *t*-test (see Table 4) was run to examine the learners' achievement who received posttest after the treatment sessions.

Table 4. Independent Sample t-test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Posttest Score	Equal variances assumed	3.054	**.085**	2.717	69	**.008**	2.366	.871	.629	4.103
	Equal variances not assumed			2.643	56.441	.011	2.366	.895	.573	4.160

The independent sample *t*-test table above revealed that the variance of both groups was significantly equal based on Levene's test for equality of variances (Sig. = .085), so the equal variances assumed was used. This row showed a p-value of .008, t = 2.717, and df = 69. So, we had that there was a statistically significant difference, according to alpha of 0.05, between two samples. It meant that there was a significant effect of CLIL on students' learning achievement. Therefore, it could be concluded that the null hypothesis of the study was rejected and the CLIL resulted significant to learners' achievement. In addition, Table 3.6 was used to look at the differences and determine whether the difference was meaningful in a practical sense.

Table 5. Descriptive Statistics of Posttest

Posttest Score								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Experimental Group	39	37.90	3.144	.503	36.88	38.92	31	45
Control Group	32	35.53	4.189	.741	34.02	37.04	25	43

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Total	71	36.83	3.813	.453	35.93	37.73	25	45

Table 5 showed the descriptive statistics for two groups. We could see that experimental group had a higher mean score than control group. It also showed that the two standard deviations between groups were met an assumption that those were equal (Experimental Group=3.144, Control Group=4.189). Therefore, it could support the assumption in the result of independent sample *t*-test gave good results. The following table was detailed information of the homogeneity of variances.

Table 6. Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Posttest Score	Based on Mean	3.054	1	69	.085
	Based on Median	2.585	1	69	.112
	Based on Median and with adjusted df	2.585	1	64.534	.113
	Based on trimmed mean	2.912	1	69	.092

Table 6, revealed that all sectors of mean, median, median and with adjusted df, and trimmed mean were (p1 =.085, p2 = .112, p3 =.113, p4 = .092), respectively, were more than 0.05. It indicated that the variances between groups on mean were significantly equal ($p > 0.05$). Thus, table 3.3 revealed the results of significant value between groups' posttest score. CLIL was entered as a fixed effect and served as the between-subjects variable. The main effect of CLIL on the results of posttest mean scores was significantly different that lower than 0.05, $F = 7.385$, $p = 0.008$, indicated that mean scores of the experimental group ($M = 37.90$) scored significantly higher than that of the control group ($M = 35.53$).

Table 7, showed the effect size was 0.648. It revealed that the effectiveness of the treatment was practical significant. Cohen (2011:293) stated that Effect size is a measure of the degree to which a phenomenon is present or the degree to which a null hypothesis is not supported. An effect size is simply a way of quantifying the difference between two groups. For example, if one group has had an 'experimental treatment' and the other has not (the 'control'), then the Effect Size is a measure of the effectiveness of the treatment.

Table 7. Independent Sample Effect Sizes

Independent Samples Effect Sizes					
		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
Posttest Score	Cohen's d	3.651	.648	.166	1.126
	Hedges' correction	3.691	.641	.164	1.113
	Glass's delta	4.189	.565	.073	1.049

Need for Follow up Explanations

Based on the result of quantitative research, it could be concluded that CLIL gave significant effect on students' learning achievement in the Merdeka Curriculum. The mean score of experimental group outperformed control group. However, the result was needed further explanations to what extend CLIL gave significant effect. Therefore, qualitative phase was done to support the result of quantitative research. Three themes were created. The first theme 'Dwelling on the Past', used to answer the sub-research question "How was students' initial

experience in CLIL Class?", which included about student's initial experience, student's initial improvement, viewing the classroom activities, and support given by teacher and classmates during the learning. The second theme was 'Dial it Back' to answer the sub-RQ "How was students' experience after joining CLIL class?" representing student's story her experience after joining CLIL. The third theme 'Broader Vision' to answer sub-RQ "What are students' evaluations and hopes about future direction for CLIL?", signified student's story about her reflection about experiencing in CLIL followed by student's aspirations on future direction of the CLIL development.

Those themes were used to retell the story obtained from a participant in experimental group who had the highest score in posttest. The participant was Jasmine (pseudonym name). She became a typical subject who believed to give real story about students' experiences in joining CLIL class. The story was used to give further explanation to what extend CLIL gave significant effect on students' learning achievement in the *Merdeka* Curriculum.

Dwelling on the Past: How was students' initial experience in CLIL Class?

In the beginning of meeting, students knew that they would learn Biology in English. They thought that they would learn Biology the same as what they had before, but their thought was incorrect. They realized that the learning objective was learning both Biology and English.

> 'I would learn Biology as usual but it was different, I learn biology and also English' (NF.1; NF.2)

Students were worried about their limited understanding on either biology concepts in English or the English. Although, students had good English proficiency, they felt that enrolled in CLIL class was challenging and made them unconfident.

> 'At the beginning, I think my understanding of both subjects were limited. Basic, if I can put it that way. …' (C1)
>
> '… my English was good, understanding Biology concepts in English was challenging. [Moreover], using good English for academic purposes was challenging' (C2)
>
> '… during class discussion and presentations. It was hard; I couldn't express my thought accurately in English. … . I was not confident enough' (C3)

Besides feeling bad at first, students were intrigued and motivated in the CLIL class. They, then, realized that CLIL offered a unique opportunity to develop a deeper understanding of subject matter while also enhancing their English proficiency.

> '[It made me feel] curious and excited in CLIL class [because] I am not only able to understand biology lesson but also learn and use English in the class.' (NF3 & 4)
>
> 'I [liked] this class because it allows me to learn English in Biology class and improved my knowledge about biology terms in English.' (NF 5 & 6)
>
> '… I understood what I should do and what I was learning. Maybe it was just a matter of getting used to it.' (C4)
>
> '…practicing in class made me understand better what I was learning and made me more confident in using English in class.' (C4)

The learning activities in CLIL was not complicated. Students explored some activities brought advantages to their learning as it learned the biology concepts in English and learn to use English during the class. In order to understand the biology concepts, they sometimes tried to translated the difficult terms while reading, before participating to the class discussion, and when asking questions and understanding teacher's explanation. It made improvement on their learning to become more confident.

> '[The class was] easy to follow, [because] there are so many activities where I can learn biology concepts in English and how to use English in the class.' (NF 7&8)

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> 'I noticed my improvement when I could actively engage in class discussion, ask questions, and understand text and teacher's explanation.' (C.5)
>
> '… . Usually, I translated first, but I felt more comfortable speaking English in class, especially when we were also taught the language. So, it became easier to practice it directly.' (C.5)

Students shared that they felt successful in learning. Jasmine gave an example when she had project with her group to examine the food chain in a marine ecosystem. She well experienced to learn some new vocabularies in the field rather learning to the common ecosystem that she had already known. In addition, she was also doing well in presenting and leading the discussions.

> '[I became interested during the classroom] when I was doing project to identify ecosystem in the sea, and present the result in front of the class.' (NF.9)
>
> '… . It was amazing experience that I should also understand vocabulary about it. I want to move from the comfort zone … rather than just identify ecosystem in common.' (NEB.9)
>
> 'I was happy that my group and I could present it successfully, and I see that our understanding about Biology increased and how we present it in English made us be more confident to use English in the class.' (NEB.9)
>
> 'We were successful in doing that, …. I think it made me more confident. Besides that, I also succeeded in using both English and Biology concepts about the coral reef ecosystem.' (C.6)

CLIL made changes on students' insights about the learning activities. They were being accustomed to the CLIL learning activities. It made them easy to follow the learning activities. However, students needed to do extra activities to improve their content knowledge and English proficiency.

> '[I remembered that I] struggle to understand several contents in English, [it was] made me to do extra activities to improve my knowledge and have better English. …' (NF. 17; NF.18)
>
> 'I sometime watched video on YouTube about Biology in English explanation. Write difficult vocabularies in my notes to help me remember and directly use them when I want to use it in Biology class.' (NEB.12)

The challenges, faced by Jasmine, had been changed into a better outcome. The teacher and her classmates also played beneficial role. The teacher helped in giving such explanations and support for class discussion. Meanwhile, her classmates gave benefits to her as they had had a better understanding than her on several topics being discussed.

> '[I remembered my teacher] always helped us by giving explanation and support us in every class discussion. (NF.11) [For me, it was] amazing and increase my motivation to be more active in the class.' (NF.12)
>
> '[I also remembered my classmates] sometime know more than me about specific lesson. (NF.14) [I thought it was] benefit me to get new and different idea [because] without my friends I am not sure I can be successful in the lesson.' (NF.15-16)

Students also encountered that CLIL course was more beneficial for them than other courses. Jasmine said that the course was unique, interesting, and valuable to understand Biology and English used in context.

> 'This course was unique, interesting, and worth it to help me understand biology in English and also learn how to use English in biology.' (NF.26)

Dial it Back: How was students' experience after joining CLIL class?

CLIL had influence significantly to the students on students' learning achievement in the *Merdeka* Curriculum. Jasmine, the representative student, described that her understanding of Biology and English compared to the earliest meeting of CLIL class had been improved.

> 'My understanding has improved significantly. I not only have better English in speaking and writing, but I also understand Biology terms in English and how to explain them in English.' (C.7)
>
> 'I can understand the teacher's explanations in English, read Biology or other subjects in English, and participate in discussions. I can use English more often than before, like expressing complex ideas without trouble.' (C.7)

However, Jasmine still had difficulties in her learning. She added her thoughts that learning in CLIL was different to her current Biology class. She had just learned Biology in English. She learned neither how to communicate nor to write academically. She was only learning Biology and frequently use English in the classroom activities.

> 'It is still very difficult to write academically in English. So I have to keep learning about this.' (C.9)
>
> 'They are similar but different. The difference is that I am not learning how to communicate, write, or learn the vocabulary in English. I just learn Biology. In the CLIL class, I am also taught about English, how to communicate effectively to convey ideas, write conclusions, and learn how to pronounce words correctly.' (C.10)

Broader Vision: What are Students' Evaluations and Hopes about Future Direction for CLIL?

Jasmine wishes she was given a real learning activities and more language learning related to Biology. The real learning activities that are preferred by her is going to the real place where the ecosystem exists. Inviting expert on Biology and having extensive learning are also her desires for her better learning outcomes.

> 'I wish the teacher gave real examples [and] extra English lesson about Biology' (NF.20; NF.21)
>
> '… [and] I can learn from Biology expert; the foreigner I mean.' (NF.23)
>
> 'Maybe we can go field trips to the place that have complete sources or go diving to the sea to see the real ecosystem.' (NEB.20)
>
> 'I want also to have additional lesson outside the classroom. I also want to ask clarification when I have difficulties and to be more active in group discussion. I believe that I can maximize my learning and achieve better academic and language proficiency.' (NEB. 24)

Therefore, she also hopes she has prepared with knowledge and English, before going to some activities in the CLIL class.

> 'I wish I myself have prepared with biology knowledge in English and be more active during the class.' (NF.24)
>
> 'I have planning to learn other topics in Biology to be more advanced learner. And other subjects that I like such as math or physic. I will keep practicing my English skill through reading, writing and improve my speaking by using apps that have AI to give feedback to my skill improvement.' (C.12)

Jasmine has experienced the improvement in CLIL class. It fuels her aspirations to study Biology at the undergraduate and potentially pursue opportunities to choose university abroad. It can be stated that the CLIL not only enhances academic performance but also broadens students' horizons and aspirations. She hopes other subjects are integrated with English for preparing her future education.

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'… Hopefully, I can also have opportunity to learn more English used in different subjects to prepare my future education.' (NEB.27)
'I want to take Biology for my undergraduate. So that I keep learning Biology in English to develop both my understanding on subject and English. I do not know maybe I have opportunities to study at university abroad.' (C.11)
'Imagine that I can have discussion with someone from other countries. It allows me to know culture and background. Plus, it will benefit me in many aspects in my life beyond school.' (C.13)

Discussion

The Effect of CLIL on Students' Learning Achievement in the Merdeka Curriculum

The quantitative data derived from the posttest scores provides clear indication of the effectiveness of CLIL in the Merdeka Curriculum. The experimental group, which received CLIL, demonstrated a significantly higher mean posttest score (37.90) compared to the control group (35.53). this difference was statistically significant, as confirmed by the independent sample t-test (p=0.008), indicating that students in the experimental group outperformed their peers in the control group. It can be assumed that the null hypothesis was rejected, and the alternative hypothesis was accepted. Therefore, it means that there was a significant difference between the posttest mean scores, indicating the use of CLIL significantly affected students' learning achievement in the Merdeka Curriculum. Furthermore, the effect size measures, including Cohen's d (0.648), indicated a large effect (Cohen J, 1988: 414) of CLIL. It could be inferred that CLIL on students' learning achievement in the Merdeka Curriculum had a practical significance application. Thus, these results collectively demonstrated that CLIL had significant effect on students' learning achievement in the Merdeka Curriculum.

Based on the result, CLIL was significantly effective on students' learning achievement in the Merdeka curriculum. Implementing CLIL in the Merdeka Curriculum, however, was either easy or challenging since the class was not always using English in the teaching and learning process. Mukadimah & Sahayu (2021) stated that implement CLIL in Indonesia context was challenging because it needs some time to prefer the best program, especially prepare teacher with more instructional strategy (Deswila et al., 2020). In the Merdeka Curriculum, teacher should develop andragogy, instructional, and socio emotional competencies to support the achievement of optimal students learning outcome (Setyaningrum et al., 2020). Furthermore, teachers in the Merdeka Curriculum play a central role in realizing the curriculum and instructional goals (Sephiawardani & Bektiningsih, 2023). Thus, the Merdeka Curriculum, which emphasized holistic education, student-centered learning, and the development of critical thinking skills, provided an ideal framework for the implementation of CLIL.

Successful CLIL in the Merdeka Curriculum depended on the developed modules that reflected the indicators of students' learning achievement. Moreover, the teaching material must be integrated with a holistic and dynamic (Febrina et al., 2022). Students' learning achievement did not only depend on the textbooks but also how the teacher improvised in dealing with differences in students' background. Therefore, designing interesting learning activities should be done to gain students' active participation in the learning (Sari, 2023), such as creating a real situation of using the language on the subject they are learning (Mukadimah et al., 2021). In addition, teacher could use learning strategies such as pair or small group discussion to achieve the learning goals in acquiring the language and the content materials of science subject (Deswila et al., 2020; Huang & Wu, 2022).

Understanding challenges that might arise was beneficial for CLIL practitioners in the implementation of CLIL within the Merdeka Curriculum. Teachers might initially lack confidence or skills in the CLIL instruction, while students found difficulty in learning content through a foreign language, particularly if they had limited proficiency. In addition, the most problem faced in implementing CLIL was arisen due to the lack of preservice programs, professional development, or training for effective implementation of CLIL because the teachers were not well trained with both content subject and language; the language teacher were not trained with subject knowledge, while subject teacher were not well trained on the language (Charunsri, 2019). Furthermore, Melti and Akis (2022) found that science and math teachers encountered some challenges in their content and language instruction for non-native English-speaking high school in IGCSE and IBDP science and math course. Those challenges included limited vocabulary in the subject matter, disruptions in translating content from the first language to the target language, weak foundational knowledge in both content and language, and difficulties in providing effective instructional feedback. Therefore, a strong collaboration between subject teacher and language teacher is essential (Lin, 2016).

When CLIL teachers has to bring CLIL learning successfully, I will ask what teachers need to facilitate CLIL learning successfully. Cañado (2018) offered seven competencies, namely linguistic, pedagogical, scientific knowledge, organizational, interpersonal, collaborative, and reflective competences that CLIL teachers should have. In short, teachers should not only improve themselves in using the target language for classroom instructional purpose, becoming good facilitator in the student-centered learning, mastering both content matter and theoretical underpinnings of CLIL, and organizing all competences while arranging them for the learning management; but also, teacher should be able differ needs of students, liaise with students, and do reflection for better learning of CLIL.

Students' Initial Experience in CLIL Class

In the earliest days of CLIL meeting, students might find difficulties to the language as they had lack of vocabulary repertoire of the subject that made them unconfident. Therefore, students should be familiarized with some essentials vocabularies as Melti and Akis (2022: 10) stated that deeply understanding scientific concepts played a vital role for students become more confident in the language of instruction and quickly process information provided. Furthermore, students with lower language proficiency or newly exposed to English will encounter difficulties understanding scientific concepts in English. They will lose their motivation to learn science (ibid: 12), when they do not have a deeper understanding of concepts. However, the students will be motivated in learning when they are accustomed to the language (C.4). It means that CLIL can improve learners' learning motivation for language learning (Karimi et al., 2019). Rachmajanti & Anugerahwati (2019) stated that teaching and learning processes should be managed in fun and play activities to gain students' interest. However, teacher could prompt questions to attract students to make them be more motivated in CLIL lesson if the students were not motivated (Evnitskaya & Dalton-Puffer, 2020). Students become more confident in learning Biology concepts in English because they like to learn English in context. Huang & Wu (2022) confirmed that learning vocabulary in context provides students with opportunities to process the information in a deeper way, which will facilitate vocabulary acquisition and memory, rather than the isolated word list. However, the students sometimes make notes about the unfamiliar vocabularies to remind them if they want use it in the learning process (NEB.12). Students sometimes did translation to make them felt more comfortable speaking English in class and participating in class discussion (C.5). Affandi & Nurfadhilah (2023) stated that CLIL proponents tended to neglect the use of L1 and translation in language (and content) learning.

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However, translating in CLIL was allowed since the translanguaging was explicitly oriented and used to scaffold meaning in the teaching and learning of content (Nikula et al., 2016).

Students in this research can be said to have exposure to English as they try to only use English in CLIL class continuously. This exposure was affected by the teacher who always used English for instructional process. Papaja (2012) stated that the collaboration between teacher and students in CLIL would bring positive effect on the subject being taught in a foreign language. If the teacher instructions in CLIL mixed between Indonesian and English or purposed to have students understand, the students might not have exposure to always use English in the class. Thus, teacher needs to sustain their motivation by exposing students to the language continuously (Rachmajanti & Anugerahwati, 2019). Setyaningrum et al (2020) confirmed that teachers played significant role to make the learning environment practicable for students to learn the content using suitable languages for communication to make them understand the content. The successful of CLIL was based on how teacher and students, moreover, students and students interactions in some classroom activities could enhance students' motivation and learning achievement (Sari, 2023).

Students' Experience after Joining CLIL Class

CLIL did not only affect students during the program, but also after the program was done. They became more accustomed to learning activities, books, videos in English used by teacher in different subjects. They also could use English more often, expressing complex ideas without being trouble. However, students might have encounter difficulties in using English academically as their prior knowledge of English sometimes different with the English used in the content subjects. Therefore, students needed to be given additional learnings materials based on their needs; it was not as the task should be done by students outside the classroom. Then, teacher could monitor the progress of the students' learning.

By providing good facilities in such ways, (Setyaningrum et al., 2020) viewed that it could help students achieve better result in CLIL class. However, sometimes it depended on how the good instruction given as (Setyaningrum et al., 2020) disappointed when the students did not realize that the video being watched before the meeting was their individual task. Deswila et al (2020) pointed that in the EFL context, teacher should understand what the students' ability of either English and content, moreover they should be able to consider what students' interest in learning. In addition, students also shared opinion that CLIL was different from other subject taught in English. They learned the language for communicating, conveying, and writing their ideas about the content in CLIL class, but was not in their previous and current classes.

Students' Reflection and Hopes of Future CLIL Class

Despite of significant effect of CLIL in the Merdeka Curriculum, CLIL did not always provide all students in better understanding on both language and content. Cossu & Brun (2021) found that learning in different language for subjects was not directly increase students' motivation in understanding the content, most of the students that were not motivated shared negative opinion in their experiences but they did not specifically describe what the challenges were. As found in the finding, they hoped they could learn in a real situation as they should understand the activities themselves. This perception appears since they are doing a project to identify ecosystem, they may just have the information of the ecosystem by searching a video on YouTube or reading online sources. It was also found by Sánchez-García, & Pavón-Vázquez (2021) that the students preferred to learn in real context because they thought that learning with practice benefited them. Thus, the implementation of CLIL in the Merdeka curriculum which the learning models are often using project-based learning should consider this hope.

Students tended to regulate themselves in continuing learning Biology and other subjects in English because they tend to pursue their next education level abroad. Zanoni (2021)

confirmed that students felt well-experienced in CLIL as practical training for their future education and career. This pedagogical implication of CLIL confirmed by Rachmajanti & Anugerahwati (2014), when students recognizing small successes after each learning experience in CLIL, it can boost students' motivation and foster their self-regulatory practices and continued effort in CLIL.

Conclusion

This research provides a comprehensive understanding on the effectiveness of CLIL in Senior High School students' learning achievement in the Merdeka Curriculum through mixed-method explanatory sequential research design. The quantitative results demonstrate that CLIL significantly influence students' learning achievement, as evidenced by the higher mean posttest score in the experimental group compared to the control group. The qualitative findings from the Narrative Frames, Narrative Empty Box, and semi-structured interviews reveal that CLIL (Content and Language Integrated Learning) significantly influence students' learning achievements in the Merdeka Curriculum. Initially, students struggled with limited vocabulary and lacked confidence in learning scientific concepts in English. However, as they became familiar with essential vocabulary and experienced continuous exposure to English through consistent use by their teachers, their confidence and ability to process information improved. When the students find difficulties about the language, translanguaging helped scaffold their understanding and participation in class discussions. In order to enhance their engagement and comprehension in learning, students expressed a preference for learning in real contexts, such as have field trips to learn the content and invite native speaker teacher who expert in the field. This practical approach aligns with project-based learning principles that often implemented in the Merdeka Curriculum, fostering motivation and self-regulatory practices as students aim for higher education abroad. Therefore, effective CLIL implementation requires continuous exposure to English, contextual learning strategies, and support for language and content understanding to maximize its positive impact on students' academic and professional futures.

In conclusion, through both quantitative and qualitative analyses, the research findings consistently demonstrated the positive impact of CLIL on students' learning achievement and language proficiency. The integration of Biology content and English language instruction not only enhanced students' understanding of complex scientific concepts but also facilitated their language development, fostering critical thinking and collaborative learning. Overall, the study underscores the potential of CLIL as a pedagogical approach to promote holistic academic and language development within diverse educational frameworks.

References

Affandi, A., & Nurfadhilah, A. S. (2023). Analysing the possibility to implement Content and Language Integrated Learning (CLIL) in Senior High School in Indonesia. *Jurnal Media Tik*, *6*(3).

Barkhuizen, G. (2014). Revisiting narrative frames: An instrument for investigating language teaching and learning. *System*, *47*, 14–27.

Cañado, P. M. L. (2018). Innovations and challenges in CLIL teacher training. *Theory into Practice*, *57*(3), 1–10.

Caravaca, R. V. (2019). Effective Questioning in CLIL classroom: Empowering Thinking. *ELT Journal*, *73*(4), 367–376.

Copyright © 2024 The Author(s)

Charunsri, K. (2019). The Challenges of Implementing Content Language Integrated Learning in Tertiary Education in Thailand: A Review and Implication of Materials. . *Advances in Language and Literary Studies*, *10*(4), 125–129.

Cossu, P., & Brun, G. (2021). Comprehensive sexuality education: an Argentinean experience. . *ELT Journal*, *75*(2), 172–180.

Cresswell, J. W. (2017). *Research Design: Qualitative, Quantitative, and Mixed Methode Approaches* . Sage Publications.

Deswila, N., Kustati, M., Besral, B., & Sukandi, S. S. (2020). Content and Language Integrated Learning (CLIL) Approach across Curriculum in Science Classrooms: Are the English Language Use and Learning Reveal?. . *Journal of Innovation in Educational and Cultural Research*, *1*(1), 15–21.

Evnitskaya, N., & Dalton-Puffer, C. (2020). Cognitive discourse functions in CLIL classrooms: Eliciting and Analysing Students' Oral Categorizations in Science and History. . *International Journal of Bilingual Education and Bilingualism*, *26*(3).

Febrina, W., Danim, S., Ariesta, R., Yulistio, D., Muktadir, A., & Irmayati, M. (2022). The Effectiveness of Developing CLIL-based Indonesian Language Course Teaching Materials at Bengkulu City Universities. *LITERA*, *21*(3).

Hidayati, T. (2016). English language teaching in Islamic education in Indonesia; challenges and opportunities. *English Journal of Language, Education, and Humanities*, *3*(2), 65–82.

Hiratsuka, T. (2014). A study into how high school students learn using narrative frames. *ELT Journal*, *68*(2), 169–178.

Hiratsuka, T. (2018). Narrative frames as a course evaluation instrument. . *The Language Teacher*, *42*(1).

Huang, T., & Wu, C. (2022). The Effect of CLIL Implementation on Students Development of English Reading Performance: An Empirical Study of Undergraduate Students in China. *International Journal of Applied Linguistics & English Literature*, *11*(3), 14–22.

Karimi, P., Lotfi, A. F., & Biria, R. (2019). Enhancing Pilot's Aviation English Learning, Attitude and Motivation through the Application of Content and Language Integrated Learning. *International Journal of Instruction*, *12*(1).

Lin, A. M. Y. (2016). *Language Across the Curriculum & CLIL in English as an Additional Language (EAL) Context*. Spinger.

Mukadimah, H., & Sahayu, W. (2021). Embedding Content and Language Integrated Learning (CLIL) into English for specific purposes curriculum for vocational high school. *Jurnal Pendidikan Vokasi*, *11*(2), 204–212.

Nikula, T., Dafouz, E., Moore, P., & Smit, U. (2016). *Conceptualising Integration in CLIL and Multilingual Education*. Multilingual Matters.

Nugraha, T. S. (2022). Kurikulum Merdeka for Learning Crisis Recovery. *Inovasi Kurikulum.* , *19*(2), 251–262.

Papaja, K. (2012). The Impact of Students' Attitude on CLIL: A Study Conducted in Higher Education. . *Latin American Journal of Content and Language Integrated Learning*, *5*(2), 28–56.

Pladevall-Ballester, E. (2016). CLIL subject selection and young learners' listening and reading comprehension skills. *International Journal Of Applied Linguistics*, *26*, 52–74.

Rachmajanti, S., & Anugerahwati, M. (2014). How Universitas Negeri Malang Primary Laboratory School Prepares the Young Generation for AFTA and MDGs. . *Conference Proceedings*, 28–30.

Rachmajanti, S., & Anugerahwati, M. (2019). Predictors of the Students' English Achievement at Lower Secondary School: CLIL Context. *TEFLIN Journal*, *30*(1), 72–87.

Sari, S. Y. (2023). Content Language Integrated Learning (CLIL) and Non-Native English Speaking (NNES) Learners English Language Acquisition. *Journal of English Language Teaching*, *12*(1), 372–379.

Sephiawardani, N. A., & Bektiningsih, K. (2023). Review of Teacher Readiness in Implementing Merdeka Curriculum at Public Elementary Schools. *JURNAL PENDIDIKAN DAN PENGAJARAN*, *56*(3), 533–542.

Setyaningrum, R. W., Setiawan, S., Anam S, & Rernaningdyah, P. (2020). Content and Language Integrated Learning (CLIL) in Science Class during COVID-19 Outbreak: A Narrative Inquiry. *Journal of English Education*, *9*(1).

Skinnari, K., & Bovellan, E. (2016). CLIL Teachers' Beliefs about Integration and about Their Professional Roles: Perspectives from a European Context. Billingual Education & Bilingualism 101 (Eds.) . *Conceptualising Integration in CLIL and Multilingual Education*, 145–167.

Soler, D., González-Davies, M., & Iñesta, A. (2016). What makes CLIL leadership effective? A Case Study. *ELT Journal,* .

Tanner, R., & Dale, L. (2015). Clarifying CLIL for the English teacher. *MET (Modern English Teacher)*, *24*(2), 25–28.

Yalçın, Ş., Bayyurt, Y., & Alahdab, B. R. (2020). Triggering effect of CLIL practice on English as a lingua franca awareness. *ELT Journal*, *74*(4), 387–397.