

Inquiry into Content and Language Integrated Learning in Mongolia

—A Japanese and science integrated lesson at a school
in Ulaanbaatar—

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Content and Language Integrated Learning (CLIL) is a recent innovative teaching approach, addressing the learning of a foreign language, as well as knowledge of the subject matter. Through adopting this approach, teachers are able to engage in alternative ways of teaching for effective learning. The approach can also foster motivation in learners and support their cognitive development, for both content and language. Recently, since the shift to democracy in the 1990s, a wave of educational reforms has been implemented in Mongolia, and students have started to view their learning as for use not only inside but also outside their country. As a result, their interest in learning both contents and foreign languages at school is increasing these days. CLIL is one way in which to learn both content and language effectively in a single lesson. Few studies, however, have assessed the effect and impact of Content and Language Integrated Learning lessons on foreign language acquisition and understanding of contents. Under these educational conditions, we have designed a CLIL lesson and implemented it for junior high school students in Ulaanbaatar, Mongolia in 2018. This study has two purposes. First, we investigate the nature of effective CLIL lesson design adapted to education in Mongolia. Second, we examine whether, and to what extent, CLIL lessons might be effective for pedagogical purposes in foreign language education and learning the content of other subject fields. Reflecting on the lesson with junior high school students, we assess the effects of the CLIL approach by examining the students' questionnaires and reactions, and an interview with a teacher. The results of this case study also suggest the potential of this method in Mongolia.

Keywords: content and language integrated learning (CLIL); foreign language teaching; science teaching; team-teaching.

1. Introduction

The country of Mongolia experienced a dynamic shift to democracy in the 1990s, and this has influenced education in the country. After democratization, the majority of students who learned

Japanese language aimed at a job with the tourist industry or at starting a business, but in recent years, they have tended to take other specific fields as their major and study Japanese language as well (The Japan Foundation, 2017). These days, Mongolia has a 6-3-3 school system, which means six years in elementary school, three years in junior high school, and three years in senior high school. Compulsory education in Mongolia is from grade one to six and seven to nine, at elementary and junior high school. Schools in Mongolia are basically integrated elementary, junior, and senior high schools. Before 2007, they had a 5-4-2 school system, eleven years in total, but as they have gradually shifted to a 12-year school system, they have adjusted to international standards. Therefore, students have started to think of studying abroad as one of their options after graduating from high school.

In Mongolia, the Ministry of Education, Culture and Science of Mongolia announced “the standard of foreign language education” in 2005, which focuses not only on Japanese language but also on other languages such as English, Chinese, Russian, Korean, and so on. In this standard, they proposed four educational keys: student-centered, practical, focusing on meanings and use, and communicative (the Japan Foundation, 2014). As a result, although the traditional teaching method for foreign languages focused on memorization of grammar, form, and use, recent foreign language education in Mongolia is shifting to elicit students’ autonomous learning through communicative activities in the classroom. In order to achieve appropriate teaching styles, they prepare some seminars for language teachers under the standard of foreign language education.

Within this educational background, Content and Language Integrated Learning (CLIL) approach might play an important role in foreign language education as one of the possibilities created by the education reforms in Mongolia. The purposes of this study are to:

1. investigate effective CLIL lesson design adapted to education in Mongolia
2. examine whether, and to what extent, CLIL lessons might be effective for pedagogical purposes in both foreign language acquisition and other subject fields

In order to achieve these purposes, we have designed a CLIL lesson integrating Japanese and science, and implemented it for junior high school students in Ulaanbaatar. The results are based on the students’ questionnaires and reactions, and an interview with a teacher, and will be examined from a sociocultural viewpoint.

2. Content and Language Integrated Learning

2-1 What is CLIL?

Content and Language Integrated Learning (CLIL) is a growing body of lesson practices that fosters multilingualism in the classroom, and it has become increasingly popular in recent years. CLIL can be seen as an empowering approach comprising dynamic and effective practices supporting language/content learning and teaching, motivation, and the cognitive development of learners. CLIL has four important principles, called the “4Cs”: content, communication, cognition, and culture (Coyle, 2007). Coyle, Holmes, and King (2009:12) explain these four dimensions (4Cs) within a conceptual framework. In this framework, content refers to “integrating content from across the curriculum through high quality language interaction,” and cognition reflects “engaging learners through creativity, higher order thinking and knowledge processing.” Communication focuses on “using language to learn and mediate ideas, thoughts and values” and culture concerns “interpreting and understanding the significance of content and language and their contribution to identity and citizenship.”

Recently, some researchers have adopted “community” as the fourth C instead of “culture.”

Among these 4Cs, cognition is acknowledged the most important aspect of CLIL. In this study, through the implementation of a CLIL lesson designed for junior high school students in Ulaanbaatar, we explore its effects on their learning and learning goals, and indicate an effective lesson paradigm for the future.

2-2 CLIL Lesson Design

In CLIL lesson design, the improvement of skill levels in cognition is an important factor to take into account while planning activities. In order to get an overview of the lesson from both micro and macro viewpoints, Bloom's taxonomy (1956) is a useful guide to how we can design activities with regard to the cognitive skill levels in the class. More recently, on the basis of their expertise in the fields of cognitive psychology, curriculum, and educational assessment, Anderson and Krathwohl (2001) adapted Bloom's original taxonomy and classified learning activities into remembering, understanding, applying, analyzing, evaluating, and creating. In CLIL lessons, various levels of cognitive skill need to be addressed in the class.

In Japan, Ikeda (2011) offered ten principles of CLIL. According to these principles, teachers:

1. consider the ratio of content to language as 1:1;
2. need to integrate four skills, while keeping them well-balanced: reading, listening, writing, and speaking;
3. use various tasks in lessons;
4. design lessons with various levels of cognitive skills: remembering, understanding, applying, analyzing, evaluating, and creating;
5. focus on learners' collaborative work;
6. include some aspects of cross-cultural understanding and international issues in the lessons;
7. use authentic teaching materials;
8. encourage not only written characters but also phonetic, numerical, and visual information;
9. prepare scaffolding for both content and language;
10. and work on improving learners' learning skills.

Considering the 4Cs, the revised taxonomy of cognitive skills, and Ikeda's ten principles of CLIL, we designed a science and foreign language teaching CLIL lesson tailored for junior high school students in Ulaanbaatar. The lesson integrated Japanese language and science content, specifically eleven experiments related to ions and the cycle of matter. This content was based on the Classbook "Ions and Foods", which is a textbook used in the Hypothesis-Experiment Class (Itakura, 2019). In addition, our lesson design had one more remarkable feature: team teaching practiced by two teachers. Team teaching lessons in foreign language classrooms are recognized as an effective approach to language teaching in Japan, and team teaching lessons have been conducted about once a week or twice a month at all public schools since the Japan Exchange and Teaching (JET) Programme started in 1987 (Sakamoto, 2018). This CLIL lesson in Ulaanbaatar was team-taught by a foreign language teacher and a science teacher. While focusing on foreign language learning, the foreign language teacher took the initiative in teaching as Teacher 1 (T1). On the other hand, while focusing on science experiments, the science teacher took the initiative in conducting those experiments as T1, and the language teacher supported T1 as Teacher 2 (T2). The two teachers conducted the lesson collaboratively, treating both content and language. The lesson was designed so that students:

1. listen to the teachers' speech and interact with them;

2. understand the goal of the lesson;
3. listen to the teachers using new words and understand their meaning;
4. enjoy games based on new words and remember the meaning of each word;
5. check the new verbs involved in the science experiments;
6. observe the 11 science experiments, discuss them in pairs, guess the results of each science experiment with their partner, and express and share their opinion in class;
7. summarize their understanding using the results of the experiments by interacting with the teachers;
8. and reflect on the lesson.

In each of the science experiments, we gave the students some time to discuss in pairs or groups and guess the results. After discussing their thoughts, students expressed their opinions and shared their own ideas in the classroom. The students developed through the interaction with teachers and fellow students. As necessary, the two teachers supported students with pedagogical scaffolding offered to individuals, to pairs, and to groups during their discussion in the lesson. Vygotsky (1978) defined the “zone of proximal development” (referred to as ZPD) as “the distance between the actual developmental level as determined by individual problem-solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers” (p. 86). Scaffolding is almost universally acknowledged as an essential element of effective teaching, and it is often used to bridge students’ learning gaps in ZPD. Students and the two teachers had opportunities for pedagogical interaction throughout the lesson. Depending on the situation, T1 and T2 played their roles from the viewpoint of each subject. At the end of the lesson, students were given some time to reflect and summarize their understanding in writing.

3. Practice

We delivered the CLIL lesson to 13 eighth grade students in a private school in Ulaanbaatar, Mongolia, on the 16th October 2018. The eighty-minute lesson was conducted as a team-taught lesson by two teachers: a language teacher and a science teacher. Many of the students in that class had already been learning Japanese since first grade, and only two of them had just started learning Japanese. The data for this study were collected through a questionnaire administered to the students, students’ written reflections, and an interview with the Mongolian science teacher.

4. Analysis

4-1 The Results of the Questionnaire

The questionnaire consisted of 22 items concerning the students’ general beliefs and their impressions of the lesson, which the students had to rate on a four-point scale. Judging from the responses, as shown in Table 1, they seemed to be favorably impressed by the CLIL lesson on Japanese and science.

Under items 7 “Today’s lesson was useful and meaningful” and 10 “By using authentic science experiments, it was easy to understand the content,” 100 percent of students evaluated the CLIL lesson as a useful and meaningful experience for their learning, and they were satisfied with the authentic science experiments because these experiments helped their understanding of the lesson’s scientific content. This shows that the framework of this CLIL lesson was effective in enhancing students’ science cognition even though the whole lesson was implemented in the Japanese language, which is a foreign language learning context for these students. Though they needed to use Japanese in the lesson in order to interact with one another, their motivation to

Table 1.

The results of the questionnaire administered to students (unit: %)

	Strongly agree	Agree	Disagree	Strongly disagree
1 I like to study Japanese.	84.6%	15.4%	0%	0%
2 I like to study science.	84.6%	15.4%	0%	0%
3 It is important to be able to function in Japanese or other languages.	61.5%	38.5%	0%	0%
4 It is important to have the ability to speak Japanese.	92.3%	7.7%	0%	0%
5 Today was interesting because we studied both Japanese and science experiments.	92.3%	0%	7.7%	0%
6 I could use Japanese to talk about science a lot.	84.6%	7.7%	7.7%	0%
7 Today's lesson was useful and meaningful.	100%	0%	0%	0%
8 I could understand the contents of the lesson.	92.3%	7.7%	0%	0%
9 When my classmates talked about the content, I could understand them.	30.7%	69.3%	0%	0%
10 By using authentic science experiments, it was easy to understand the content.	100%	0%	0%	0%
11 I like science experiments.	92.3%	7.7%	0%	0%
12 While discussing the science experiment in Japanese, I conveyed my opinions to my partner clearly.	46.1%	38.5%	7.7%	7.7%
13 I felt less resistance to speaking Japanese in this lesson.	30.8%	61.5%	7.7%	0%
14 I could exchange opinions in the group discussion.	46.15%	46.15%	7.7%	0%
15 When I listened to my classmates' talk, I felt interested.	69.3%	23.0%	7.7%	0%
16 This science and Japanese lesson was useful for speaking Japanese.	77.0%	23.0%	0%	0%
17 Through this lesson, I became more aware of learning Japanese.	84.6%	15.4%	0%	0%
18 Through this lesson, I became more aware of learning science.	92.3%	7.7%	0%	0%
19 This lesson design would be useful to learn Japanese in the future.	84.6%	7.7%	7.7%	0%
20 Student discussions are useful in lessons on science and Japanese.	61.5%	38.5%	0%	0%
21 Through Japanese interaction, I learned from my classmates.	38.5%	61.5%	0%	0%
22 Science experiment lessons are useful for the future.	84.6%	15.4%	0%	0%

learn stayed high and constant throughout the class. One possible factor is that, since science experiments are not usual in science classrooms in Mongolia, this lesson might have been perceived as new by the students, helping them to develop an interest in the science contents. On the other hand, when we focus on the items that only four or five students marked with “strongly agree” on the questionnaire’s scale, we find items such as 9 “When my classmates talked about the content, I could understand them,” 12 “While discussing the science experiment in Japanese, I conveyed my opinions to my partner clearly,” 13 “I felt less resistance to speaking Japanese in this lesson,” 14 “I could exchange opinions in the group discussion,” and 21 “Through Japanese interaction, I learned from my classmates.” These results indicate that they did not feel confident during their interactions with their classmates in Japanese. This evaluation refers to the times when the students had to express their opinion (and understand their partners’ opinions) in Japanese. In fact, they were observed to switch to their native language on several occasions. While the results of the questionnaire are positive on average, it is worth noting that one student marked “strongly disagree” on the scale with regard to item 12 “While discussing the science experiment in Japanese, I conveyed my opinions to my partner clearly.” Looking at this student’s questionnaire, however, he marked “strongly agree” on the scale with regard to all the items concerning his learning development in science, such as 7 “Today’s lesson was useful and meaningful,” 10 “By using authentic science experiments, it was easy to understand the content,” 18 “Through this lesson, I became more aware of learning science,” and 22 “Science experiment lessons are useful for my future.” This shows that he found himself struggling only when he had to have a discussion in Japanese in the classroom.

Focusing on the students’ understandings of the content in Japanese and their interest in science, most of the students answered “strongly agree” to items such as 5 “Today was interesting because we studied both Japanese and science experiments,” 8 “I could understand the content of the lesson,” 17 “Through this lesson, I became more aware of learning Japanese,” and 18 “Through this lesson, I became more aware of learning science.” This indicates that they had few problems with language comprehension (both listening and reading), since they could mostly understand the teachers’ explanations and content written in Japanese. For the students, passive activities such as listening and reading are somewhat easier, but in active uses of language such as speaking and writing, they experienced struggles to interact and express their opinions. This might indicate that there are two aspects to take into account regarding students’ needs. The first is that they need more opportunities in the first part of the lesson to practice Japanese and learn useful expressions in order to discuss or advance their opinions. The second is that they need more language activities in which to discuss, interact, and convey their thoughts in Japanese in the classroom. Judging from the results as a whole, it seems to be clear that students’ motivation to learn both Japanese and science emerged and grew through the class. Though most of the students evaluated the lesson positively, their feedback through the questionnaire suggested necessary improvements for future lessons.

4-2 Students’ Written Reflections

We analyzed the students’ written reflections by coding them and categorizing them into groups, as shown in Figure 1. Some of the students focus on (b) views of science, and some on (j) views of Japanese. Comparing these results to the results of a four-point scale questionnaire shows that the students who had a stronger motivation toward science noticed, by themselves, that they could (c) deepen their scientific cognition and experienced (d) scientific awareness. One student, A, provided feedback as below.

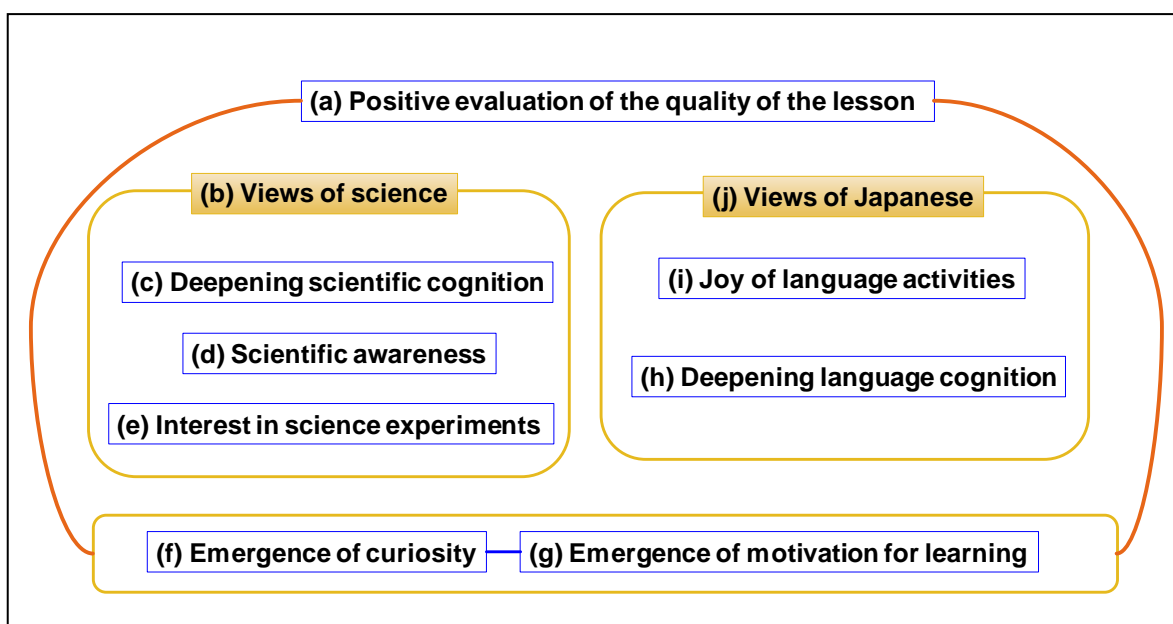


Figure 1. Concepts in students' written reflections

The new words bingo was a lot of fun, and I never thought that we could make electricity from vegetables and fruits. It was a big surprise.

His discovery in the lesson increased his motivation to learn science, and we can say that his (d) scientific awareness was inspired by the lesson. Even though their guesses about the results of experiments were not correct, their (e) interest in science experiments increased. On the other hand, focusing on the Japanese language aspect, another student wrote that he really enjoyed the language activities for remembering new Japanese words, the “new words bingo”, resulting in (i) joy in language activities. Various kinds of language activity in the lesson can help students to (h) deepen language cognition. As a result, they could appreciate the lesson from the points of view of both science and Japanese. At the same time, their comments included (f) emergence of curiosity and (g) emergence of motivation to learn. Student B described his impression of the CLIL lesson as below.

What I learned today was meaningful for me, and now I want to learn Japanese more.

His words show that his emerging (g) motivation for Japanese language learning was instigated through learning science. Both (f) emergence of curiosity and (g) emergence of motivation to learn are important ways to support students in deepening their learning achievements in the classroom. When students give a (a) positive evaluation of the quality of the lesson, their learning experience in the classroom would be enriched both in terms of (b) views of science and (j) views of Japanese. In this lesson, we can say that content and language were well balanced (1:1, as mentioned earlier). Only one student, student C, focused on our teaching style in his reflection, as follows.

I discovered that Japanese teachers carefully teach students in the classroom. In the lesson, they walked over to us and had discussions with individual students. I liked our communication with the teachers because it was helpful in the class.

His impressions of the CLIL lesson included (a) positive evaluation of the quality of the lesson, and his words indicate that he acknowledged the lesson meta-cognitively. In other words, he was aware of the purpose of our teaching style, and of the meaning of having discussions about science experiments. His focus seems to be on the process of fostering autonomous learners in the class.

4-3 The Interview

The last data collection method used in the present study was an interview conducted by the authors with a Mongolian science teacher who observed this lesson. The interview was conducted in Mongolian; it was translated into Japanese first, and then translated into English. The interview started from the topic of science experiments in the classroom in Mongolia, and she gave the following explanation.

“In my science classes, I explained about ions but I didn’t explain the relationship between ions and electricity using food. We rarely have science experiments in the class. The school curriculum of Mongolia does not include science experiments, so we cannot do that. Today’s lesson was very good because it made students increase their knowledge of authentic science, and they really learned a lot.”

From her interview, we learned that they rarely had science experiments in the classroom, so it is understandable that many of the students answered “strongly agree” to the items about the influence of science experiments on the lesson. The combined science and language lesson is likely to have been an unusual experience for them. She understood the students’ need to learn Japanese and talked about it as follows.

“Many of the students in this school are thinking about studying in Japan after passing the exams of the MEXT program, so this kind of lesson is really good for them because they can learn Japanese for specific purposes, for example explaining science in Japanese.”

She grasped her students’ needs clearly, so she had a good understanding of the relationship between students’ needs and the CLIL lesson. She viewed the CLIL lesson as a useful approach for teaching science to her students. In fact, since the students need to take the exam of the MEXT (Ministry of Education, Culture, Sports, Science and Technology) program, which is held in Japanese, she was thinking about what her students need to prepare to study in Japan.

In the interview, two more of her comments indicate her own teaching awareness as a teacher. She articulated her awareness as follows.

“In today’s lesson, your question to the students, ‘Why do you think so?’ was really good, I think.”

“I am a science teacher and I do not speak Japanese, so a team-teaching lesson with a language teacher was a really new discovery.”

These two comments tell us that, when she experienced the new teaching approach (the CLIL lesson), she understood its characteristics immediately, explained her awareness of and new discovery in the lesson meta-cognitively, accepted the approach, and tried to adapt her understanding to the situation. Her sequential mental movements can help us to trace her professional development as a science teacher.

5. Conclusion

This study explored how the CLIL approach, which in this case integrated science and Japanese learning, affected junior high school students' learning experience in Ulaanbaatar. The results of a questionnaire, reflections written by the students, and an interview with a Mongolian science teacher highlighted the fact that both aspects of science and Japanese learning worked well in the classroom, and led to a positive evaluation of the quality of the CLIL lesson. On the other hand, as the results of the questionnaire show, we observed the need to design more language activities in which students can learn about useful Japanese expressions in order to be able to manage discussions and interactions, as well as to convey their own opinions and thoughts to their classmates. From the science teacher's point of view, as she clearly understood the students' need to study Japanese, observing this CLIL lesson acted as a trigger to developing new views about teaching in her school.

The results of this case study of a CLIL lesson indicate that this approach might be a very effective approach, fostering students' motivation to learn both content and language, and building on their potential for future learning achievements.

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