

CLIL in Japan: The Implementation, Challenges, and Design of a Psychology CLIL Course

日本における CLIL :
心理学 CLIL コースの実施, 課題, デザイン

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Abstract

Content and Language Integrated Learning (CLIL) has become an important teaching approach for foreign language education. This is a dual-focus approach to learning where students learn academic content through a foreign language. The aim of this paper is to provide information for other teachers and institutions that are considering implementing a CLIL course into their foreign language curriculum. In this paper, we first provide background on this teaching approach, the positive effect it has on learning, and some recent criticisms of it. Then, we describe survey research conducted at Hirosaki University, a national university in Japan, that resulted in the development and design of a CLIL course within the English program. Next, we consider cognitive load theory and how this can become an obstacle to teaching CLIL and possible ways to overcome this by focusing on the following three effects: the multimedia learning effect, the embodied learning effect, and the collaborative learning effect. Using these learning effects, we report on the development and design of a Psychology CLIL course that was taught in the spring of 2023. Finally, we conclude with some reflections.

Keywords: CLIL, psychology, cognitive load theory, curriculum innovation

Content and Language Integrated Learning (CLIL) is a dual-focused education approach that developed in Europe in the late 1990s. CLIL is based on a 4 Cs (content, cognition, communication, and culture) framework (Coyle et al., 2010). That is to say, students learn a foreign language (e.g., English in a Japanese context) through learning academic content; develop their higher order thinking skills (based on Bloom's revised taxonomy, see Krathwohl, 2002) by completing tasks that are open-ended and require analysis, synthesis, and creativity; have ample opportunities to interact with others and use the language in a meaningful way during class; and develop their intercultural awareness and understanding. Therefore, a CLIL teaching methodology needs to consider these 4 Cs when designing a course.

As CLIL spread around the world, it also grew in popularity in Japan resulting in the formation of the Japan CLIL Pedagogy Association (J-CLIL for short, see <https://www.j-clil.com>) that has 100s of active members and regular workshops, seminars, and conferences. In the 2010s Sophia University was one of the first universities to integrate CLIL into their language curriculum (see Watanabe et al., 2011). CLIL is not a unified teaching approach, but rather a highly diverse approach that aims to blend content instruction with foreign language

learning (see Coyle et al., 2010 for more details). Teaching a foreign language through content has been claimed to be nothing less than a “methodological revolution” (Pavón Vázquez & Rubio, 2010, p. 48). In fact, during the first decade of the 2000s, a growing body of empirical studies (primarily from Europe) began to show a *CLIL effect*. Specifically, data results demonstrated that CLIL learners outperformed non-CLIL peers on a number of academic measurements such as communicative competence, vocabulary knowledge, writing, creativity, listening skills, and learner motivation (e.g., Dalton-Puffer, 2008, 2009; Jiménez Catalán et al., 2009; Ruiz de Zaborre & Lasagabaster, 2010; Ruiz de Zarobe, 2011; Várkuti, 2010). In addition, in one study, Lasagabaster and Sierra (2009) showed that CLIL students had significantly more positive attitudes towards English than non-CLIL (or English as a Foreign Language (EFL)) students, which the authors interpreted as being the result of more meaningful interaction with English in the CLIL classroom compared to a typical EFL classroom. In addition, yet not as thoroughly researched, these positive outcomes extend to content knowledge, as compared to students who were taught the content in their L1.

However, the second decade of the 2000s saw some pullback and questions began to emerge concerning CLIL as a teaching approach. Birdsell (2020a) pointed out several emerging criticisms in the field. First, the term CLIL itself began to be used in an overly inclusive way. This resulted in “soft” and “hard” versions,¹ and in essence, became a blanket term for all language teaching methods that might happen to teach some content through a communicative approach. Thus, the term CLIL began to be used quite indiscriminately in the field resulting in it becoming vague in meaning and consequently elusive as a construct to research. Some have even suggested that it is now “difficult to think of any teaching or learning activity in which an L2/foreign language would be used that could not be considered CLIL” (Cenoz et al., 2013, p. 4). To address this pluralistic approach to CLIL, Birdsell (2020a) recommends researchers and teachers to use a radar chart (see Figure 4 for an example of a radar chart) to describe the CLIL used in their study or classroom based on four criteria (e.g., L1 (first language) use, content (broad in scope to specific), L2 (second language) level, and curriculum integration). Using such a chart provides specifics to the CLIL used in that study and thus enables teachers and researchers to make more accurate comparisons between CLIL designed courses across institutions. Secondly, the field of CLIL has suffered from a lack of teaching material. As a result, many teachers end up developing their own textbook or handouts.

Finally, questions about the effectiveness of CLIL as a teaching paradigm have also surfaced, as the data that supported the CLIL effect began to be scrutinized more closely (see Bruton, 2011a, 2011b). For example, Sylén and Thompson (2015) conducted a study in Sweden with high school students and found that CLIL students had higher motivation, more positive attitudes, and higher confidence to learn English than non-CLIL students. Yet, the authors cautioned that these were not necessarily the result of CLIL, but simply individual differences between the students, thus resulting in these motivated students being more interested in taking a CLIL course. This has also been suggested by previous researchers in the field (e.g., see Küppers & Trautmann, 2013; Paran, 2013). A recent review study (Goris et al., 2019) evaluated longitudinal findings from CLIL research over the past 20 years. Again, results seem rather ambivalent. For example, the authors show that a number of studies that tested receptive vocabulary knowledge showed no positive effect for CLIL classes, but significant results were found for idioms and grammar. Other studies in this review also show significant results for spoken fluency. Thus, research into the benefits of CLIL on learning gains, content knowledge, and student motivation is still evolving and more research

¹ Soft CLIL has more explicit language instruction and thus plays a primary role in the design of the lesson. In contrast, Hard CLIL has more explicit content instruction. However, CLIL, being a dual-focused approach, emphasizes both language learning and content learning. The main difference between these two approaches is one of magnitude and the degree to which the teacher focuses on language or content.

needs to be done to determine whether these effects are causal, correlational, or even non-existent.

As research continues to be conducted into this CLIL effect, it is also important to investigate students' interest in taking a CLIL course and the best ways forward in developing one at the tertiary level in Japan. CLIL practitioners at diverse levels need to share and reflect on their experiences developing and teaching these courses and this is the goal of this paper. The outline of this paper is as follows. First, we describe the process of developing and implementing a CLIL course at a national university in Japan, and then assess some of the difficulties of learning academic content through English and how we overcame some of these challenges when designing the course materials. Finally, we provide some reflections on this experience after teaching this course during the 2023 academic year.

Curriculum Innovation: Investigating Students' Interests in CLIL

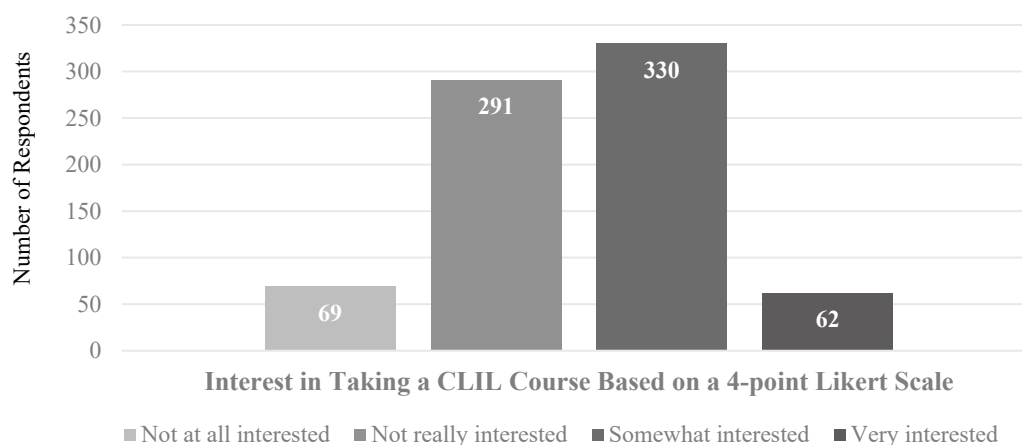
Ideally the aim of educational institutions is to maximize learning and prepare students for their uncertain futures. In addition, it is also to enhance students' interest and motivation to continue learning beyond the classroom and after graduation. This requires curriculum innovation by assessing and redesigning current curriculums and identifying areas for improvement based on students' interests and advancements in educational theories and this includes foreign language education curriculums. Hirosaki University in 2020–2021 underwent this process, resulting in the development of a CLIL course. In this section of the paper, we describe the survey and data collected that initiated the establishment of this course at the university.

Results from a Survey at the University

In 2020 Hirosaki University started a working group to restructure the English program. As an initial step, a large survey was conducted at the university and students ($N = 752$) from all faculties and schools (i.e., Humanities and Social Sciences, Education, Agriculture and Life Sciences, Science and Technology, Medicine, Health Sciences, and Clinical Psychological Science) responded to a short survey. The aim of the survey was to better understand the needs and interests of the students in regards to English learning. One question on this survey asked the participants to rate their interest in taking a CLIL course (a short explanation of CLIL was provided in the survey). Roughly 52% of student respondents indicated interest in taking a CLIL course based on a 4-point Likert scale (see Figure 1).

Figure 1

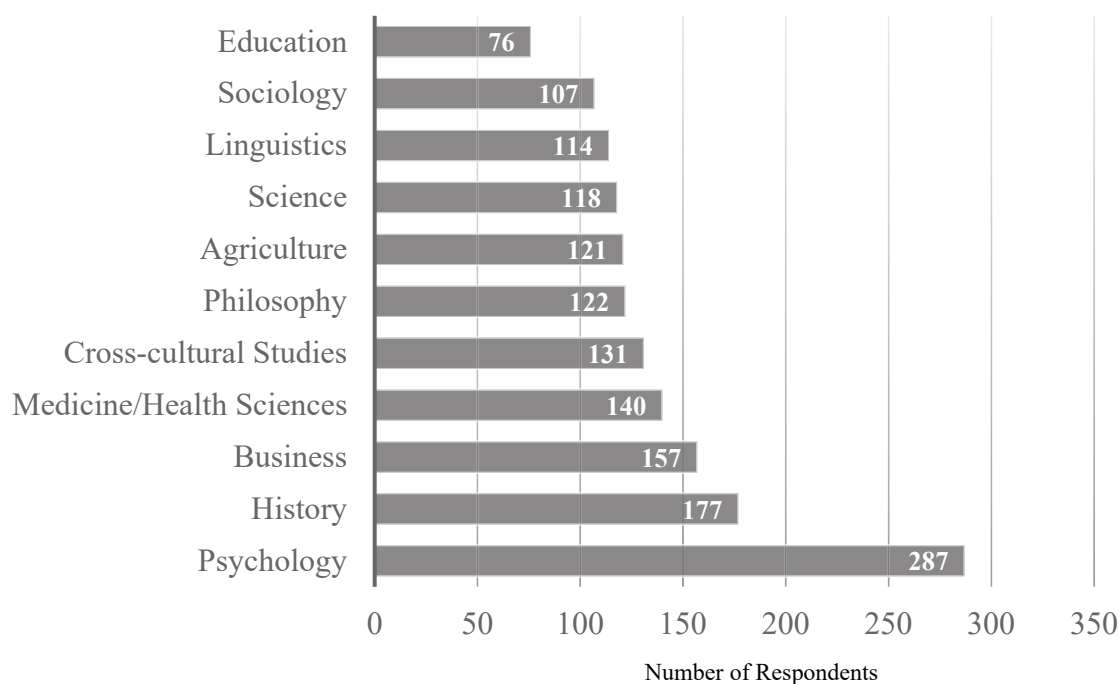
Students' Interest in Taking a CLIL Course



A follow-up question for students who indicated interest ($N = 392$) in taking a CLIL course asked them to select academic content that interested them (see Figure 2). Psychology overwhelmingly showed the highest interest among this group of students with 73% indicating interest in this content subject, followed by history at 45%, whereas education showed the lowest interest at 19%.

Figure 2

Students' Interest in Taking Different Academic Courses



Note: Students were able to select multiple items.

In a follow-up study, a second CLIL Questionnaire was conducted during the first semester of the 2023–2024 academic year to a new cohort of students. Student respondents ($N = 994$) in 1st year mandatory English classes from all faculties and schools similarly rated a list of academic content subjects on a 4-point Likert scale that interested them. Two additional content items were added to this list (Sustainable Development Goals (SDGs) and Japanese culture). Again, results show that psychology scored the highest with 75% of respondents indicating interest in this subject, followed by medicine/health sciences at 54%, Japanese culture at 52%, and history at 48%. In addition, 20% indicated having a “strong” interest in learning psychology, which is almost twice as high as other content subjects besides medicine/health sciences, which also scored high (17%). Both of these surveys confirm earlier studies that found similar results and the wide interest among students in learning psychology through English (see Birdsell & Sandu, 2015).

Taking the results from this survey into account, the working group recommended to the university to develop an annually rotating CLIL course for 2nd year and above students at the university using the following three content subjects: psychology, history, and cultural studies. In this paper, we focus on developing the Psychology CLIL course. However, before describing the course, we considered possible challenges that students might face when learning academic content through a foreign language.

Overcoming the Cognitive Challenges of CLIL

When designing instructional material, it is always important to take cognition into account to maximize the learning process. As Sweller and colleagues (2011) have stated, “without knowledge of human cognitive processes, instructional design is blind” (p. V). This is very true for designing material for CLIL textbooks. For example, when the teacher presents information to students, if this information is both new (e.g., as in, new academic content) and in a foreign language, this will increase the cognitive load on the students’ working memory system. Cognitive Load Theory (CLT) is one of the more prominent theories in educational psychology, and was developed by John Sweller and colleagues in the 1980s (Sweller et al., 2011). CLT examines the relationship between instructional design and human cognitive architecture, notably working memory and long term-memory (Sweller et al., 2011). Working memory (WM) is when we consciously process information, working as temporary storage, allowing us to manipulate this information for comprehension, reasoning, and to construct new knowledge structures (see Baddeley, 2000 for a model of WM; and Baddeley, 2012 for a recent overview of WM). This includes pulling information from long-term memory and working with new information within our present environment. However, WM has limitations both in terms of capacity – Miller’s “magical number seven” plus-or-minus two (Miller, 1956) or more likely four (see Cowan, 2010) and duration—roughly 15-30 seconds before it fades unless rehearsed (Peterson & Peterson, 1959).

In more detail, current models of WM, based on the work of Baddeley (2000, 2012), describe two systems: fluid systems and crystallized systems. Fluid systems are the moment-by-moment conscious and fleeting attentional experiences of the present. These include the central executive system that manages attention; a phonological loop for language and sounds; an episodic buffer for personal knowledge and experiences (possibly including the sensory systems of smell and taste); and a visuospatial sketchpad for visual, spatial, and haptic information. On the other hand, the crystallized systems are part of long-term memory (language, episodic memories, and visual semantics) and these connect to the fluid systems. The phonological loop is commonly referred to as the “inner voice” since it is our current awareness of the sounds and words that we are attending to in our environment (this can include inner thoughts) and these sounds activate long-term memory knowledge for language. In contrast, the visuospatial sketchpad is often referred to as the “inner eye,” and is not limited to images, but also other information within our field of vision like gestures and body movements as well as haptic and spatial information. In short, visual and linguistic information are processed through different systems. This suggests that accompanying text with congruent visuospatial information (e.g., images, gestures, etc.) has the potential to improve the efficiency of information processing and reduce the cognitive burden on a single system. Many studies have been conducted over the past decade that have shown the positive effect action (e.g., gestures) and pictures have on learning foreign language vocabulary (see Andrä et al., 2020; Macedonia & Klimesch, 2014).

In a CLIL approach to learning, new content information is presented through a foreign language and this obviously has implications on the students’ WM systems. The goal of learning is to process this new information, connect it to prior knowledge structures, and store it in a vast long-term memory system that is not known to have any capacity limitations. Thus, CLT can be highly informative for CLIL teachers. Some CLIL researchers have suggested that not taking CLT into account may lead to negative outcomes for the students (Piesche et al., 2016; Roussel et al., 2017). To minimize the cognitive load for students taking a CLIL course, it is important to consider three effects when designing material: the multimedia effect, the embodied effect, and the collaborative effect.

The Multimedia Learning Effect

The multimedia effect (or principle) (see Butcher, 2014; Mayer, 2009) suggests that adding visuals to text-only material can enhance understanding of the content. This is supported by research findings that show “learning

with words and pictures is more effective than learning with words alone” (Butcher, 2014 p. 174). Evidence for this has a long history in educational design. For example, Mayer (1997) showed through a review of eight studies that students who received coordinated explanations in both verbal and visual format produced more creative solutions on problem-solving tests, as compared to students who only received verbal explanations.

Two common ways to promote a multimedia learning effect in education is the use of semantic and pictorial visual displays (McCrudden & Rapp, 2017). A semantic visual display communicates information typically through text or words using such design features as sequences (spatially arranging boxes and connecting arrows to show steps and processes), hierarchies, matrices, pyramids, and other displays that can be easily developed using software such as Microsoft Word’s “SmartArt.” Moreover, concept maps (Nesbit & Adelsope, 2006) are also an effective way to communicate relationships between concepts through linking them together with lines or arrows.

In contrast, a pictorial visual display depicts information through images, icons, or illustrations. As artificial intelligence improves with text to image models that can generate images, such technology can assist teachers in developing visual materials for a CLIL course. For example, OpenAI’s DALL-E (<https://labs.openai.com>) can generate images from a simple prompt, and though far from perfect and limited in many ways, it still has great potential for teachers to add visual cues to CLIL text. Below is an image generated from DALL-E that shows students gesturing (see Figure 3). Another possible online application includes Craiyon (<https://www.craiyon.com>).

Figure 3

Examples of an Image Generated with AI Technology



Note. Image generated using the prompt “A sketch of two students gesturing to each other” by OpenAI, DALL-E, 2023 (<https://labs.openai.com>).

Animations, commonly used in educational videos, involve the dynamic representation of images that move continuously from frame to frame, and thus the images are transient and temporal. Due to this transiency, some have argued (Ayres & Paas, 2007) that animations place greater demands on the learners’ cognitive systems, thus reducing their intended benefits. Yet, with new video viewing technologies that allow the viewer to easily pause, rewind, and add closed captioning or L1 subtitles, animations in the form of short videos have become a widely used mode for educational content. Some of these educational animations focus more on using semantic visual displays (e.g., Khan Academy, <https://www.youtube.com/@khanacademy>) while others on pictorial visual displays

(e.g., Sprouts, <https://www.youtube.com/@sprouts>). In short, the multimedia learning effect highlights the positive outcomes visual information either on paper (e.g., textbook, handouts), screen (e.g., PowerPoint), or video can have on learners by complementing textual information and allowing the individual to more deeply and efficiently process the information.

The Embodied Learning Effect

According to embodied cognition, language is tightly coupled with the body and understanding language involves running a mental simulation of past experiential traces (Zwaan & Taylor, 2006). Therefore, the body plays an active role in language production and comprehension. A large body of evidence from both neuroimaging and behavioral studies support this theory (see Shapiro, 2019 for an updated review of this theory) and more recently it has made an important impact on the field of education (Macrine & Fugate, 2022), and more specifically foreign language education (Birdsell, 2020b). Research suggests that when congruent action (e.g., gesture or enacting the meaning of the words) is performed during language learning, this action improves learning outcomes and enhances long-term memory for the language (see Birdsell, 2021; Macedonia, 2014).

Thus, to reduce the cognitive load on the working memory system while learning content through a foreign language, it is beneficial to provide visuospatial cues through the body. This includes the teacher being aware of the positive impact of gesturing and enacting the meaning of the language as well as encouraging students when working in groups to similarly use gestures to facilitate communication.

The Collaborative Learning Effect

CLIL courses inherently focus on developing learners' communication skills, and this is most likely accomplished through collaboration and group work activities. Such activities where students work together and collaborate on a task have the potential to assist students, particularly those with lower foreign language skills. Collaborating and interacting as a group has the potential to reduce the cognitive load on the individual students as the group creates a reservoir of cognitive capacity (Kirschner et al., 2011).

In summary, the dual focus of a CLIL course creates the potential to increase the cognitive load on individual students, resulting in impaired learning. However, there are ways to decrease this possibility through using additional modes of communication (e.g., visuals such as images and gestures) and doing collaborative work. In the next section of this paper, we will describe how we designed the CLIL Psychology course to maximize student learning based on the current understanding of the cognitive architecture of humans, as outlined above.

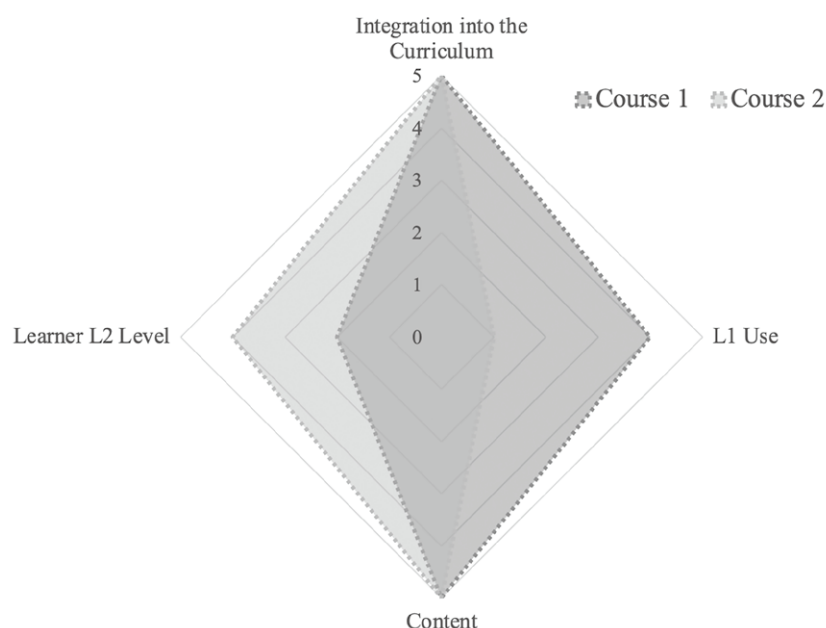
Course Design for a CLIL Psychology Course

In this section, we describe how a CLIL course was developed specifically at Hirosaki University. To start, two classes were designed that used the same syllabi and textbook. These classes were taught by teachers with backgrounds in applied linguistics as well as in the field of psychology. One teacher's L1 is Japanese and the other English. Students were divided into two classes based on a university English placement test (the dividing line was roughly equivalent to 650 TOEIC). Lower-level students were placed in the class with the L1 Japanese teacher who provided additional L1 support, whereas the higher-level students were placed in the class with the L1 English teacher. Dividing students based on foreign language level for a CLIL course is based on "Flow" theory (Csikszentmihalyi, 1996). In other words, if the challenge (in this case, learning psychology through an L2) is too low for the learners' skills, the learner becomes bored; on the other hand, if the challenge is too high, the learner experiences anxiety. So, to minimize the boredom and anxiety of the learners, the CLIL course was divided into these two classes that were similar in most aspects except how much L1 support the students received. Using a

radar chart (see Figure 4) developed by Birdsell (2020a) to illustrate the CLIL course on four criteria, the classes differed based on learners' L2 levels and L1 support, but both classes are tightly integrated into the university curriculum, as part of a group of courses called "Academic English" intended for second year and above students within the Center for Liberal Arts Development and Practices. Moreover, both courses are content courses focusing on a single academic content topic, in this case, psychology.

Figure 4

A Radar Chart Describing Similarities and Differences Between the Two CLIL Courses



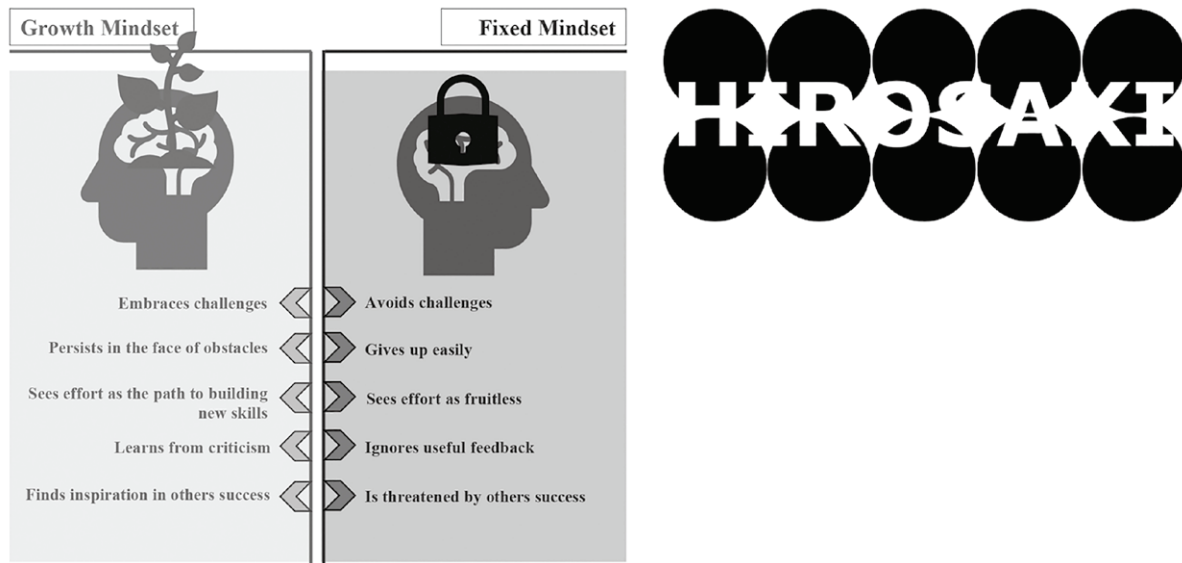
Multimodal Learning and the Development of a CLIL Psychology Textbook

One issue that has frequently surfaced in the CLIL literature is the lack of CLIL materials, especially "hard" CLIL textbooks. This has been previously discussed by many authors as being an obstacle within the CLIL framework (see Banegas, 2014; Mehisto, 2012), and usually results in teachers themselves making their own materials. Thus, in the end, we decided to design our own textbook. The textbook is composed of three sections (Growth and Motivation, Cognitive Psychology, and Personality and Social Psychology) and each section has three units, and at the end of each section students complete a group project (e.g., PowerPoint, group debate).

To begin designing the textbook, we first examined ways to integrate multimodal materials that are rich in visual content into the textbook and this includes designing semantic visual displays. Below are two examples of this from the textbook, generated by the lead author (see Figure 5). The one on the left illustrates Carol Dweck's (2006) growth and fixed mindsets and the right one shows the Gestalt principle of closure.

Figure 5

Two Examples of Semantic Visual Displays in the CLIL Psychology Textbook



In addition, animated videos were also included in the textbook by links. Some of these videos had L1 support through subtitles and all of them had the capacity for closed captioning to provide L2 textual support. Furthermore, during class, the teachers used gestures, enactment, and other forms of nonverbal communication to accompany the language, thus reducing the cognitive load for the students, as they did not have to rely entirely on linguistic information for meaning construction.

Collaborative Learning and the Design of a CLIL Psychology Course

When teaching content, teachers often feel inclined to lecture, and this in turn results in individualized learning and digresses from the goal of improving student communication skills, one of the four Cs in a CLIL approach. Therefore, we designed the class to follow a flipped classroom model with multimodal learning outside class time where students watched video lectures and read text (with images) at home. For each of the sections, students were placed into groups of three and each student in the group watched a different video. There are three linked videos in the textbook connected to each weekly reading assignment. Students watched the video at home and prepared a summary of it. Then at the start of class, based on a jigsaw design, each student summarized the video they watched to the other students, then they compared and contrasted similarities and differences between the videos.

To increase chances to develop students' communication skills as well as their abilities to interact and collaborate with other members in the class, students also did dialogue practice based on the weekly topic. For example, in each unit of the textbook, there are three individuals (Hiroshi from Hirosaki, Japan; Deborah from Sicily, Italy; and Marina from Guadalajara, Mexico) who are studying psychology at an international university. At the end of the unit, there is a practice dialogue where they discuss some of the themes of the unit. The goal of this part is to show how topics related to academic content can be turned into everyday conversations by students. In addition, students completed projects at the end of each section such as PowerPoint and poster presentations as well as a debate.

Teacher Reflections on Teaching a CLIL Course

After teaching this CLIL course in the spring of 2023, we reflected on this class to consider difficulties and

possible ways to improve it in the future as well as more general observations from teaching it. The following are some of the difficulties we encountered:

- Having students do group work outside the classroom (e.g., preparing for a group presentation). This is magnified by the diversity of the students in the class, coming from multiple faculties and ranging from 2nd to 4th year students who have very different class, work, and life schedules. As a result, most of the collaborative work for this class was done during class time.
- Overcoming the “educational frame” that constrains many of the students’ expectations of learning. For instance, from years in the classroom, many students have developed a rich frame of how a class should be conducted. This likely includes students sitting in rows, the teacher standing on an elevated platform, the teacher using something like PowerPoint to transfer knowledge from one (e.g., the teacher) to another (e.g., the student) in an individualized way based on a competitive principle (e.g., students are competitors each competing for the highest grade). A CLIL approach turns this upside down by increasing the responsibility of learning onto the learner, as the format of the class focuses more on communication, creativity, and collaboration than traditional models of education. Some students might easily adapt this new approach into their “educational frame,” recognizing the merits of it, while others, in contrast, might struggle to recognize the benefits of it. They may not understand the constructive process of learning with their peers, and instead overly depend on their teachers for learning.

In regards to general observations over the semester from teaching the CLIL course, below are a couple remarks:

- Understanding cognitive load is important for teaching CLIL in Japan. Besides the beforementioned design strategies (e.g., multimedia effect), we also observed the importance of shifting attention through using a variety of activities. This included doing a variety of student-centered activities like group work summarizing the videos, practicing dialogues, discussing open-ended questions, and teacher-centered activities like reviewing and expanding the textbook content.
- Each class had 7-9 students, which was optimal for conducting a CLIL course. The course design could accommodate up to 20-25 students. However, if the number of students increased to over 25, it would be difficult to conduct the class using the CLIL approach (e.g., focusing on communication, doing presentations, teacher interaction with the separate groups while doing group activities, etc.).
- This is not limited to CLIL, but a growing concern across all fields of education: how to evaluate students where the focus is not on rote memorization of facts (e.g., a test) nor on some end product (e.g., an essay, paper) that can easily be produced by natural language processing models (e.g., ChatGPT-3.5, Google Gemini). Thus, the evaluation of an end project needs to be process oriented (i.e., to see the development of the product through stages) or be productive in the sense of the students actively doing something with the product (e.g., presenting or debating it).

Conclusions

Theoretical and empirical studies continue to inform our understanding of CLIL. However, it is also important for teachers to disseminate practical information about developing, designing, and teaching CLIL courses at their institutions to provide a deeper understanding of the impact CLIL is having on tertiary education in Japan. In this paper, we first described the reasons why we developed a CLIL course at the university, how we selected the academic content, and important considerations when designing the syllabus and materials for the course. Then, we specifically provided examples of designing a CLIL Psychology course, including the textbook and some key characteristics of the class flow, which emphasized a balance and the interconnection between learning academic content, doing activities that build learners’ communication skills, and developing learners’ higher order thinking skills.

Supplementary Materials

The Psychology CLIL textbook developed for this course can be downloaded from the following website: <https://bbirdsell.wixsite.com/index/research>

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