論文（*Article*）

A CLIL Approach to Syllabus Development Utilizing Taxonomies from the Cognitive Domain

スティーブン・マクナマラ

Stephen McNamara

Content and Language Integrated Learning (CLIL) as a pedagogical approach has become increasingly mainstream in European education, with governmental support through policy, specifically through the European Commission, legitimizing and authenticating its role as central to language curriculum development on that continent (Coyle, Hood, & Marsh, 2010; Commission of the European Communities, 2004-2006). In Japan, there has commonly been an approach to language learning that can be characterized as a "banking model", where a teacher makes language "deposits" into the "account" of the learner (Friere, 1970). These deposits take the form of discrete pieces of language, with their contextual relevance confined to their immediate use as a means for passing exams. With a national push for Japan to internationalize its economy, and an trends toward socio-constructivist approaches to education it seems pertinent for a more contextually relevant approach to language learning to come to the fore, and in recent years there has been increasing interest in developing syllabi that recognize this need (Yoshida, 2009). One expression of this is higher education institutions in Japan beginning to incorporate CLIL approaches into their frameworks for developing curricula and syllabi.
This literature review will explain current CLIL theories, with a focus on interdisciplinary synergies; the distinction between basic interpersonal communication skills and cognitive academic language proficiency; the synergistic effect of cognition in a CLIL syllabus; learning domains and taxonomies that can inform planning for cognitive elements in a CLIL syllabus, with examples of two taxonomies. Finally, the review will locate a context within existing CLIL theory for syllabus development, with the aim of providing methods for underpinning certain syllabi with established taxonomies, under the assumption that they can add an organized and sequential cognitive element to previously established linguistic goals and objectives.

Key Words : CLIL, learning domains, cognitive taxonomy, BICS and CALP, syllabus development

CLIL

Content Language and Integrated Learning is an approach to education using a second or additional language for the study of both language and content. The study of language and content occur simultaneously as well as *through* each other. In this way, the additional language is a vehicle for content learning, and the content is a vehicle for the learning of a language. In the nomenclature of much of the literature, the additional language is often referred to as the "vehicular language", rather than the "second" or "additional" language, reflecting language's role in driving the overall learning (Bolaffi et al, 2002). This nominative distinction also reflects the idea that in many educational contexts, the vehicular language is not necessarily secondary or additional for some students in the class; for example, an east Canadian classroom may have a minority of French speakers operating in their first language. This mode of learning, CLIL, differs from traditional modes of language learning, particularly in the compulsory language subjects of the Japanese education system, in that the additional language to be learnt is not separate from other subjects, providing essential opportunities for learners to contextualize their language use, and to practice language in much more contextually realistic situations.

Interdisciplinary Approach

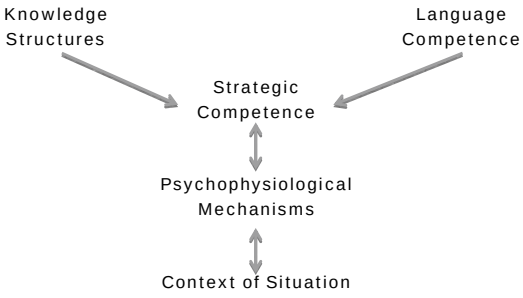
Another way to think of CLIL is as an interdisciplinary approach. As an example, when an education system recognizes that it needs to prepare its graduates for entering the global business world, at some stage it may add a subject such as "business studies", or the like. Rather than focusing on one skill aspect of business, such as human resource management, the syllabus designer is likely to incorporate a multitude of disciplines that enable a greater understanding of the overarching idea. For example, the designer may include a unit on global human resource management, with a sub-focus on anthropology, globalization of human resource's environmental impact, and formal chemistry or geography study to support the understanding of the mechanics of environmental impact. This combination requires students to acquire skills in a multitude of disciplines to be able to address the topic, and the combination further allows students to contextualize the sub-disciplines and the subject as a whole. This interdisciplinary approach is already present in secondary education, clearly seen in the International Baccalaureate educational philosophy and its subsequent curriculum design. Study areas are represented by inquiry-provoking guiding questions, with skills and formal disciplines listed *subsequently* rather than the disciplines listed as dominant and separate categories for study (IBO, 2015). Language study would seem to be an integral sub-discipline of the aforementioned "Globalization" subject example. In this multi-disciplinary approach, language learning is undertaken by learning subject specific items in the vehicular language, enabling a deeper rage of engagement with the umbrella topic. In this way, a combination of disciplines, including language, enables students to contextually learn and contextually apply their recently acquired skills. This is one aspect of CLIL learning that is described as a synergistic effect on learning, the learning being greater than the sum of its parts, and is a convincing justification for CLIL use in classrooms that had been hitherto solely focused on language.

BICS and CALP

Language teachers have long found insight from Jim Cummins's (1979) distinction between usage of BICS, language used for interacting socially and conversationally, and cognitive academic language proficiency (CALP), the language needed to engage with cognitively challenging tasks in an academic setting. Over time, this distinction has been honed and refined and continues to remain relevant for CLIL syllabus design (Biber, 1986; Brewster, 2009). This distinction has remained relevant in CLIL for the following reason: cognitive academic proficiency necessarily contains the aspect of academic cognition for language use. The cognitive academic aspect can, and often is, addressed separately from language learning. In this case, language learning relies on previously internalized academic and cognitive functions learned in L1. This approach, while functional, is arguably not as efficacious for developing CALP through an integrated CLIL approach, as it negates the need for engaging certain cognitive functions while operating in L2. The justification for this approach is that it leaves more cognitive horsepower available for language processing.

Bachman (1990), offers an expanded analysis that can apply to CALP, however under the acronym of CLA, Communicative Language Ability. This is defined as "consisting of both knowledge, or competence, and the capacity for implementing that competence in appropriate contextualized communicative language use". This idea is further exemplified by Candlin (1986), whom Bachman quotes, as a combination of knowledge structures and procedures applied to addressing problems of communication. Bachman offers a framework of CLA that comprises of three sections: language competence, a knowledge of forms used to communicate; strategic competence, competencies relating to the context of the situation; and psychophysiological mechanisms, processes of mechanical, physical and neurological operations used to deliver language, things such as muscle control of the mouth. The interplay of these components combine to produce what he sees as CLA.

Figure 1. ***Components of communicative language ability in communicative language use.*** **(Adapted from Bachman, 1990)**



The reason that Bachman's view is pertinent to the discussion of CALP, and further, to CLIL itself,

is based in the component of strategic competence. Bachman views this component as a combination of: knowledge structures, things such as socio-cultural knowledge, historical knowledge and other general knowledge of the world; and language competence, of which he expands upon in some detail, but for the scope of this paper will be very generally described as a combination of organizational competencies, and pragmatic linguistic competencies such as illocutionary competence and sociolinguistic competence. The manner in which Bachman has identified the strategic competency of CLA as being a product of a *combination* of knowledge of the world and knowledge of language, again suggests that CLA is a product of cognitive academic content study and formal linguistic study, the basic tenet of CLIL.

Further Synergies

CLIL researchers argue that a combination of cognitive and skill-based goals will have a synergistic effect on both (Coyle, Hood, & Marsh, 2010). The engagement produced by tasks that activate cognition in the content of the syllabus support the effective learning of language, and this in turn feeds back to engagement with content. As noted in Coyle, Hood, & Marsh (2010), "when learners are able to accommodate cognitive challenge- they are likely to be engaged in interacting with 'expert' others and peers to develop their individual thinking". This again has a cyclical, self-reinforcing effect. In turn, this gives the syllabus developer a role of facilitation rather than transaction, providing achievable cognitive challenges, with scaffolded language support, in addition to opportunities for peer and expert interaction. This can also necessitate development of metacognitive skills, where students learn *how* to approach their learning, including meta-language instruction.

In order to do these things, the cognitive challenges themselves need to be identified in order to develop lessons that provide students the necessary opportunities to address them. Due to this, an explicit choice of a cognitive taxonomy can be adapted and then used to identify both linguistic and cognitive goals for the teacher and learner, underpinning the entire syllabus. Some would argue that identification of cognitive and knowledge processes alone, without a particular choice of taxonomy, are sufficient for CLIL syllabus development purposes, although identification of a suitable taxonomy for both linguistic and cognitive goals is often the starting point for developing a this type of syllabus (Coyle, Hood, & Marsh, 2010).

Learning Domains

In 1956, Benjamin Bloom published his theory of learning domains, which, in some iteration, has been widely used for curriculum development and assessment ever since. The theory included three domains: the cognitive, the affective and the psychomotor (Bloom, 1956). The domains can be understood thus: the Cognitive domain: ways in which the mind applies knowledge; the Affective domain, how students approach learning- how they participate, and what values and motivations they have for learning certain ideas; and the Psychomotor, ways the body and mind facilitate learning- actions such as controlling a pen or automating a grammar rule. Bachman's previously mentioned psychophysiological mechanisms category in his theory of CLA is possibly a derivation of Bloom's psychomotor domain. In addition, the common educational acronym, KSA, Knowledge, Skills and Attitudes, seems to be a further echo of Bloom's original domain distinctions, respectively relating to the cognitive, psychomotor and affective. Example 1, below, illustrates how a student action operates in the three domains.

Example 1.

A high school student takes an English test. She looks at the first question, on vocabulary. The question is difficult for her, and she feels disheartened. However, she realizes the importance of the test, and furthermore the importance of her scores in this subject, so she strains to recall the study she did previously. She remembers, picks up her pen and writes an answer.

In example 1, the student is functioning to some degree in all three domains. Firstly, when she decides that it is worth trying to attempt the question, she is operating in the affective domain. As Bloom would have it, she is expressing her understanding of the *value* of the exercise. Her attempt to remember her preparation is a function of the cognitive domain: she is recalling and using an item of knowledge. Picking up her pen and writing is an operation that falls in the category of the psychomotor, she is conducting a physical activity that allows her to express the knowledge: picking up the pen is a "basic fundamental movement", whereas her penmanship is a product of her developed fine motor skill, something she has learned by constant physical repetition.

Taxonomies

The word taxonomy is derived from the Greek words, “taxis” and “nomia”, which respectively translate as “arrangement” and “method”. A taxonomy is a system of classification of things or ideas, and aims to name and briefly explain the concepts that inform these classifications. For example, a taxonomy in the study of biology is a system that names certain organisms, and then classifies them into groups based on their behaviors, characteristics or other features, offering very brief descriptions of these features. Taxonomies are typically an order of stages that operate hierarchically. Taxonomies are used in education for syllabus design and student assessment, becoming a common method for informing choices in these areas since Bloom’s influence in the late 1950’s.

Within each of Bloom’s domains there is a taxonomy. This article focuses on the cognitive domain’s taxonomy, as it is most applicable to developing a CLIL syllabus that aims to achieve the synergy mentioned in the earlier paragraph. Bloom’s determination of the subsets, the items of the taxonomy, was seminal in the study of this idea, and his influence can be seen in many later iterations of cognitive taxonomies. Bloom’s taxonomy broke the cognitive domain into 6 subsets: knowledge; comprehension; application; analysis; and synthesis.

Figure 2. *Bloom’s cognitive domain.* (Adapted from Bloom, 1956)

Bloom's Cognitive Domain

Higher Order Thinking Skills	Evaluation	Assessing theories; solving; recommending; evaluating outcomes
	Synthesis	Combining old concepts to make new ideas; inferring; predicting; designing
	Analysis	Finding and analyzing patterns; organizing; identifying trends
	Application	Applying methods to solve problems; manipulating; experimenting; trialing
	Comprehension	Summarizing; demonstrating; translating; discussing
Lower Order Thinking Skills	Knowledge	Recall; observation; listing; naming

Sequencing of language syllabi and their resultant testing can often be seen following this path, beginning with lessons and assessments that require recall, then moving through comprehension to application, inference and reflection. It is important to note that these subsets start from the empirical and culminate with the more abstract, building on the knowledge gained in the lower orders. In this way the subsets’ skills are understood to be acquired in a linear (or possibly cyclical) fashion. This is reflected in the visual representation of Blooms taxonomy, often expressed as a pyramid, and is expressed in a syllabus by a linear plan. Syllabi without an explicit taxonomical basis often still express this sequential progression simply by a gradual increase in difficulty from one lesson to the next. It is also important to note that although the subsets are thought of as functioning sequentially, they can also operate simultaneously or non-consecutively, as students rarely enter the classroom without having acquired some of them before. This holds true even for children taking their first steps in formal education, who rely on the empirical, observation and recall, to engage with their first lesson’s content. Some curricula and syllabi assume student’s prior functionality in these subsets and reflect this by designating the subsets in a non-sequential manner (IBO, 2015). In any case, the influence of a taxonomic approach to learning is present, wittingly or not, in much of today’s curriculum design, from disciplines as diverse as early childhood education to legal curricula. Indeed, much of the current curriculum of English for Academic Purposes follows a sequenced and hierarchical development that can be easily located within the cognitive domain of Bloom’s taxonomy or a comparable section of more recent cognitive taxonomies. Example 2, below, is an assessment task, which illustrates a gradual increase in difficulty, and expresses the subsets of the cognitive domain of Bloom’s taxonomy, visible in figure 2.

Example 2.

1. Which of these words is spelt incorrectly?
   A. farming B. faarming C. farmer D. farmers

2. Translate the following words into your first language.
   A. rice B. field C. agriculture D. irrigation

3. What techniques can a farmer use to make his rice grow?

4. Irrigation system A uses much more water than B, and is more expensive. However, farms using system B make less profit. What possible reasons can you think of for this?

5. A farmer is designing an irrigation system. Using ideas from the article, and your own ideas, what suggestions can you give to the farmer?

In example two, each question requires use of a different subset from Bloom's cognitive domain. Question 1 requires recall and identification of a memorized item. Question 2 requires a translation, and the answer demonstrates "understanding" of the word's meaning. 3 requires an application of knowledge to solve a problem. 4 combines "analysis" and "synthesis", by requiring recognition of a pattern and an inference: that more water will equate to more crop. Finally, 5 is a combination of "synthesis" and "evaluation", requiring use of older knowledge to create a prediction for the most efficacious application of irrigation, and asking for a recommendation for a beneficial outcome. It is useful to note that questions 3, 4 and 5 cannot be attempted without use of the lower order cognitive skills contained in the domain. In this manner quiz gives an example of the hierarchical nature of the subset skills. The cyclical nature of the taxonomy can be understood by the idea that question 5 may create new ideas that can be categorized in the "knowledge" subset, thus allowing for the re-application of the taxonomy.

Bloom's taxonomy was subsequently updated by a group of educational psychologists headed by Lori Anderson in the 1990's. This update altered Bloom's original domain nomenclature from nouns to verbs, to reflect the application of ideas in the domain, rather than just their identification. Both taxonomies can be separated in to two groups of thinking skills: remembering, understanding and applying categorized as lower order thinking skills (LOTS), analyzing, creating and evaluating as higher order thinking skills (HOTS).

Anderson again revised the taxonomy in 2001, this time with David Krathwol, adding a "Knowledge Dimension" sub-category that outlines knowledge domains relevant to cognitive processes (Anderson & Krathwol, 2001). The taxonomy is widely used, and therefore offers the advantage of already being well established in the literature, albeit often in diverse contexts. It also includes detail of epistemological skill-sets in both the "Knowledge Dimension" category, and cognitive processing skills in the "Cognitive Process Dimension" category. This outlining of skill-sets has particular use for syllabus development, as it allows for decisions to be made on the scope and sequence for the syllabus as a whole, and subsequently these can be broken down into what skills, and their related language, need to be facilitated unit-by-unit, lesson-by-lesson.

Figure 3. ***Revised Bloom's taxonomy, 2001.*** **(Adapted from Anderson & Krathwol, 2001)**

The Cognitive Process Dimension		The Knowledge Dimension	
Creating	Combining parts to make something new; producing; planning; predicting	Metacognitive Knowledge	Self knowledge; strategies for learning
Evaluating	Making judgments; checking	Procedural Knowledge	Knowledge of: how to do things; of techniques; procedures
Analyzing	Breaking concepts into components; differentiating; attributing	Conceptual Knowledge	Knowledge of relationships; categories and structures
Applying	Using procedures; executing; implementing	Factual Knowledge	Knowledge of: terminology; details and components
Understanding	Making meaning from experience; interpreting; summarizing; explaining		
Remembering	Recall; recognizing		

Our Context, Conclusions and Recommendations

The English Language Programme (ELP) of Kwansei Gakuin University, Social Policy Studies Department is a two-year academic English programme. The programme has six graded levels, and each level is divided into four compulsory classes that cover the macro skills of academic English. Curriculum goals for these classes are coordinated, with goals and objectives aligning horizontally and vertically, and under constant individual and collaborative review. Although there is some amount of assessment and teaching of content in these core classes, the balance between content and language learning is firmly on the side of language. Students are streamed according to their TOEFL results, a further indicator that language dominates content in the programme. In the context under discussion, where the broader programme's linguistic goals are academic, the focus on CALP seems straightforward, yet the cognition aspect of syllabus design is something that is overlooked in favour of linguistic objectives.

In the two upper grades of the course, students take a Special Topics (ST) class. Students have some influence over which class they will attend, although attendance in one of the classes is mandatory. The ST classes are nominally content-based, and although linguistic instruction is encouraged, these classes are seen as a space for students to use their recently acquired skills in a lower-stakes academic lesson. The ST classes are still under the umbrella of the curriculum's goals and objectives, although if justified, assessment can be of content as well as language. These classes provide an excellent

starting position for implementing a CLIL approach, and the literature review above has aimed to offer some explanation of CLIL theories and the taxonomies they employ, in order to better facilitate the ST syllabus development process. An adapted version of the 2001 Anderson taxonomy is currently being applied to the syllabus of one of the current ST courses, Western Art History.

In our CLIL syllabus development for the ST Art History course, so far, some choices of which cognitive skills are to be included and which omitted have been made due to the expediency of aligning the ST syllabus goals with curriculum's language goals. A future study would do well to make these choices more transparent in their justification. In addition, the relationship between cognitive skills as explained by Bloom's taxonomy of the cognitive domain and the subsequent Anderson iteration, to the linguistic goals of the SPS ELP curriculum, could be better determined. This determination could extend to the micro, with the linguistic targets that enable each cognitive function exemplified lesson by lesson. Further, the intrinsic nature of the content of an Art History programme could be categorized according to the linguistic and cognitive functions it best promotes, and as the title of the subject suggests, there is a necessary combination of disciplines.

The "how" of CLIL syllabus development in our context is also an area that should be addressed. Due to the combination of language and content in this type of syllabus, the logistics of collaboration between experts in language syllabus design and Art History content would seem necessary. If an interdisciplinary approach is to be undertaken, it will also be necessary to determine the balance between content and language. This could be undertaken by a closer analysis of the dominant pedagogical paradigms already operating in the programme, with a view to enhancing them through an explicitly addressed cognitive element. This cognitive element will then need to be assessed, and the balance of weighting between content, language and cognition will need to be further explored, as well as the overall efficacy of a CLIL syllabus operating within the current curriculum. It is hoped by doing so that we will be able to further extend the depth of our syllabi.

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