



## 室蘭工業大学で英語教育内容重視の指導法

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# Content-Based Instruction in Muroran Institute of Technology: A Critical Evaluation

Brian GAYNOR

## 室蘭工業大学で英語教育内容重視の指導法

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**Abstract :** This paper examines the factors necessary for the successful implementation of a Content-Based Instruction (CBI) curriculum in MuroranIT. It outlines the shortcomings of current approaches in the university where CBI has erroneously been regarded as merely the English translation of an established academic course taught through Japanese. As this short essay will argue, effective CBI requires much more than this and raises the fundamental question of whether MuroranIT is currently capable of offering CBI courses. In answering this question I will divide my essay into five parts: a theoretical explanation of what CBI is (and isn't); the importance of needs analysis; materials development; issues with assessment; and faculty support. I will conclude with some observations on current English education in the university and propose some tentative ideas on how to better implement our nascent CBI curriculum.

**Key words :** Content-Based Instruction (CBI), materials development, assessment, faculty collaboration

### 1. Introduction

In an effort to improve the quality of higher education and attract more foreign students to Japan, there has been a renewed emphasis placed on the importance of English in both undergraduate and post-graduate education. In 2009 the Ministry of Education launched its 'Global 30' initiative with the aim of 'internationalizing' the country's higher education and attracting 300,000 foreign students to Japan by the year 2020 (MEXT, 2009). One of the main pedagogical proposals espoused in this initiative is to dramatically increase the number of degree programs taught through English, principally through Content Based Instruction (CBI). As with all higher education policies in Japan, what is implemented at the elite level eventually trickles down, albeit in a diluted form, to all tertiary institutions. Thus Muroran Institute of Technology (MuroranIT) too finds itself having to adapt to the demands of academic globalization and is fitfully introducing versions of CBI, principally at the post-graduate level. However, a lack of knowledge of its theoretical antecedents, methodological approaches and required pedagogical knowledge has resulted

in CBI being erroneously regarded as merely the English translation of an established Japanese language academic course. As this short essay will argue, effective CBI requires much more than this and raises the fundamental question of whether MuroranIT is currently capable of offering CBI courses. In answering this question I will divide my essay into five parts: a theoretical explanation of what CBI is (and isn't); the importance of needs analysis; materials development; issues with assessment; and faculty support. I will conclude with some observations on current English education in the university and propose some tentative ideas on how to better implement our nascent CBI curriculum.

## **2. Theoretical antecedents**

CBI is defined as “the concurrent teaching of academic subject matter and second language skills” (Brinton, Snow & Wesche, 2003: 2). Unlike other language instruction approaches that define primary content in terms of grammatical structures, communicative language functions, or language skills, in CBI content refers to “the use of non-language subject matter that is closely aligned with traditional school subjects, themes of interest to students, or vocational and occupational areas” (Stoller, 2008:59).

By providing students with authentic, meaningful academic contexts, CBI aims to develop both the students' language and their content knowledge. The emphasis though, should be on the former. Prioritizing content over language immediately raises the question of why the students are not learning it through Japanese. If the teacher's primary intention is to further students' understanding of the academic content then learning efficiency (and some consideration for the demands placed on the students) necessarily insists upon the class being delivered in the students' first language, Japanese. However, if the aim is to learn English via content then all content teaching should be first filtered and understood in terms of language learning. Pedagogically this calls for something more, a lot more in fact, than laborious sentence by sentence translations of English textbooks in chemistry or electrical engineering. As Butler notes, “In CBI, language is not merely the object of learning, but also the means for negotiating meaning, organizing information, and acquiring content knowledge” (2005: 229).

The development of CBI has been supported by various research findings from second language acquisition (Swain, 1993; Brinton, Snow & Wesche, 2003). In particular, the role of comprehensive input and output, along with the importance of determining contextually appropriate language forms have been

highlighted (Stoller, 2004). CBI builds upon students' previously acquired knowledge of the academic subject matter, providing them with meaningful and comprehensive input in context, what Krashen (1985) considers to be one of the key factors in language acquisition. Such comprehensible input thus allows for a focus on forms, not just on meaning, thus enabling students to develop their productive skills too. In contrast, an over emphasis on reductive, sentence level translation will, at best, enable students to shakily grasp the meaning of the content, but it won't enable them to understand how such meaning is constructed, nor equip them with the language skills to produce similar meanings themselves.

Moreover, the specialized discourse involved in CBI approaches also facilitates students' development of their Cognitive Academic Language Proficiency (CALP) skills (Cummins, 2000). It also enhances their general cognitive skills by providing students with challenging content material and tasks. According to Sticht (1997), "All human intellectual activities such as thinking, communicating, problem solving, and learning require both processes and content (knowledge). This implies that attempting to raise people's cognitive abilities to high levels simply by improving processes such as 'reading', 'writing' and 'critical thinking' is futile. To perform the processes will require high levels of content knowledge on which processes can operate" (1997:8).

Thus, as Anderson (1990) has shown, a well planned CBI course that provides students with meaningful and coherent information leads to an increase in cognitive processing, depth of processing, discourse comprehension and motivation.

### **3. Needs Analysis**

Instigating a CBI program needs to begin with the question 'why?'; there has to be a clear purpose to the program, clear to both teachers and students alike, or the program will lack validity from the very start. Clarity here requires more than a non-specific justification along the lines of "because English is important for their future careers". This may well be so, but such a statement doesn't help in clarifying the pedagogical goals for either students or teachers. Rather, program goals and students' needs should be specified in addition to detailing how the necessary curriculum balance between language and content will be achieved.

It is worth noting here the methodological differences between implementing a CBI curriculum in an

ESL program versus an EFL program. Students in an ESL context in a country like America or Australia are usually expected to merge into mainstream classes as effectively and as quickly as possible. However, in EFL contexts the main motivation for adopting a CBI based curriculum is in order to provide students with comprehensive input through content so that they can develop their English ability. As Butler has found, a common problem with this formulation is that “there appears to be a widespread assumption that providing meaningful input through content is a sufficient base for adequate language development” (2005: 234). Yet, as Swain (1985, 1993) has shown input alone is not sufficient for adequate language development. Furthermore, research in diverse contexts has repeatedly shown (Pica, 2002; Pica & Washburn, 2002; Swain, 1998) that discourse in CBI classes conducted by subject teachers is overwhelmingly on content rather than language, and that learners have little opportunity to notice, understand and repair mistakes in their language usage. Stryker and Leaver (1997) found that tertiary foreign language learners “wanted and needed” explicit grammar instruction in their CBI course. Thus, unlike the integrative aim of CBI in ESL courses, the primary goal in EFL contexts is on language learning and this requires “conscious efforts to design and employ appropriate curricula, tasks, instructional strategies, and assessment are necessary in order to facilitate students’ language learning” (Butler, 2005: 234). Determining what is ‘appropriate’ is the answer to our original ‘why’ question, and we can best arrive at this answer by undertaking a comprehensive needs analysis.

#### **4. Materials Development**

As we have seen the benefits that can be derived from a CBI approach are many, but they come with one very important proviso: the content must match the language abilities of the students. Introduce content in English that is beyond students’ present capabilities and the perverse effect will be to demotivate them. Thus, for instance, the use of specialized science textbooks in English intended for post graduate students in the United States is entirely inappropriate for low level Japanese students here in MuroranIT.

Based on their observations of a four week English for business course, Yogman and Kaylani (1996) conclude that there appears to be a minimum proficiency level that is required for students to participate in predominantly content related activities. Similarly, Gatehouse, in her analysis of a CBI course in health science, found that students who had a low level of general English language proficiency, “simply found

the content activities to be overwhelming” (2001: 8). My own observations of similar classes here in MuroranIT mirror these conclusions; the gap between lesson content and students’ language ability is simply too wide.

This critical point bears repeating: CBI is not merely translating English textbooks into Japanese, though unfortunately this seems to be the case for most ‘specialized’ post graduate courses in MuroranIT. Content teachers’ expectations that their post graduate students ‘should’ have the necessary English proficiency in no way obviates the obvious fact that the majority of students don’t have it. Deliberately ignoring this point is a pedagogically lazy way of teaching and self-serving too, as it enables the content teachers to absolve themselves of responsibility by assigning students’ incomprehension to lack of effort.

To bridge this gap requires that the emphasis be on English instruction rather than content instruction, and requires considerably more than just a textbook and a dictionary. Rather, as Short notes, “in order to make English language input as comprehensible as possible, the teacher should present information through diverse media: realia, graphs, demonstrations, pre-reading and pre-writing strategies” (1993: 628). Nor should the focus be solely on input as to develop communicative competence in their chosen subjects, learners must have extended opportunities to use their English.

What this all means in terms of materials development is that the focus should not be on understanding English language specialist textbooks, but rather on using, adapting or creating materials that are pedagogically exploitable. Such materials, in addition to the desired content, should contain a range of language functions and structures that enable the teacher to teach CBI as a holistic, thematically rich whole incorporating instruction in both English and content. In choosing their materials teachers must determine a series of effective balances between content and language learning, comprehensible input and output, and opportunities for understanding and production.

## **5. Assessment**

According to Stoller “assessment represents another formidable challenge for CBI practitioners” (2008:66). The very nature of CBI instruction means that it is difficult to systemically separate language learning from content learning. This in turn means that it is difficult for teachers to determine whether students’ poor performance is due to language issues or incomprehension of the content. A related issue is

whether assessment should be summative or formative. Summative assessment is traditionally the norm whereby students take formal, end of term exams and their capabilities are determined at that specific point in time. In contrast, formative assessment is more complex “as its intention is to be directly diagnostic with a view to immediately impacting on the learner’s next steps” (Coyle *et al*, 2010:112).

Research in CBI settings has tended to favour a formative approach to assessment. Dweck (1986) has found that summative assessment demotivates learners, while Sadler (1989) argued that learners should be given authentic evaluative experience, so that they could identify work of high quality and evaluate their own progress towards it. Clarke (2001) likens summative assessment to the simple measurement of a plant, and formative assessment to the feeding process which leads to growth. This is not to say that summative assessment is not needed, but rather it should not be the sole means of determining students’ ability, perhaps not even the main one; rather the emphasis should be on continuous formative assessment that enhances language learning to the extent that it in turn leads to better summative outcomes.

This in turn raises the issues of what formative procedures to use particularly in terms of how we regularly assess English language use in the classroom. Short recommends “skill checklists and reading/writing inventories, anecdotal records and teacher observations, student evaluations, portfolios, performance-based tasks, essay writing, oral reports, and interviews” (1993: 629). Similarly, Brown and Hudson (1998: 658) advocate three ‘response’ approaches, namely:

- (1) selected-response (including true-false, matching, and multiple choice assessments);
- (2) constructed-response (including fill-in, short-answer, and performance assessments);
- (3) personal-response (including conference, portfolio, and self and peer assessments).

Whichever assessment approach is adopted it should be clearly linked to the course’s learning objectives and expected outcomes. Equally important, assessment measures and success criteria in both content and language should be made clear to the students. In CBI it is not enough to state that students will have passed if they gain 60% or more on a traditional, end of term, paper test. Rather, as CBI is intended to equip students with the English necessary for purposeful communication in specific contexts, so it should be assessed as close as possible to these contexts. This necessarily requires a mixture of formal and

informal assessment which is both task-based and language-based, with an emphasis on continuous formative appraisal and feedback.

## 6. Faculty Support

Implementing an effective CBI program makes complex demands on content teachers; they not only require a sufficient level of English proficiency, but also need to be familiar with issues of language structure and use in their chosen content, along with having a skilled awareness of students' proficiency levels and language learning strategies. Similarly, language teachers need to have sufficient detailed knowledge of the content and how it is best taught, as well as about language use in the specific discourse.

The most workable remedy is a form of cooperation between both sets of faculty, but unfortunately here in MuroranIT experience suggests that this is difficult to achieve. Part of this has to do with curriculum scheduling, but perceptions on both sides play their part too. On the content side, teachers believe that the introduction of content through English, be it as a lecture, presentation, textbook, or supplemental reading is sufficient in of itself and requires no further change in their usual teaching practices. From the EFL faculty's point of view, the highly specialized nature of the core content effectively precludes them from teaching it. Furthermore, there is also present a subtle undercurrent of marginalization; as a science and engineering university pedagogical approaches perceived as highly effective among language professionals are perceived as less important than the content teachers' pedagogical practices. This has also been observed in other institutions in Japan (Butler, 2005) and China, what Cargill *et al* term "academic compartmentalization" (2012: 62). As Stoller emphatically states, "The undermining of the language teachers' contributions to language and content teacher partnerships marginalizes not only the language teacher but also the students who are supposed to benefit from the language teachers' contributions" (2008: 66).

To counter such effects it is imperative that faculty from both sides of the divide move out of their "traditional comfort zones and enter into a more complex and less secure space" (Coyle *et al*, 2010: 162). Specifically, structures need to be put in place that enable content teachers and

language teachers to come together and collaborate on planning, designing, implementing, evaluating and adapting a CBI program. Such structures should not be ad hoc or sporadic, but rather systematic and ongoing, with a cross-disciplinary approach that valorizes both content and language teaching.

## **7. Conclusion**

Like many other universities in Japan attempting to introduce similar curricula, MuroranIT faces a number of ongoing problems impeding the successful implementation of CBI. These, as we have seen, include coordination between content and language instructors, materials development, faculty training and, perhaps most important, the low level proficiency of our students. With an average TOEIC score of 365 after completing two and a half years of compulsory undergraduate English education, our students simply do not possess the language ability to undertake content courses at the postgraduate level conducted solely in English. This does not mean that a successful CBI program cannot be undertaken, but it does mean that it requires a lot more planning and preparation than simply engaging in an English to Japanese translation of a specialized course book. Following from research conducted by Moeller (1994) and Okazaki (1997) on implementing a successful CBI program for low level language learners, I would recommend a syllabus design based on the following principles:

- (1) Include a variety of instructional approaches, e.g. lectures, laboratory work, controlled discussions, presentations, written reports, etc.
- (2) Maximize time on language learning tasks with an emphasis on intellectually challenging, holistic activities, not trivial item discrete meaning.
- (3) Concentrate on comprehensible language learning tasks and activities, not merely content coverage.
- (4) Provide continuous and specific feedback to students, both oral and written.
- (5) Stimulate problem solving and critical thinking through group interaction; combine rather than isolate students.
- (6) As students are at the post graduate level, the emphasis should be on practical, cooperative learning activities, rather than individual competitive tasks.

(7) Use textbooks as organizers and reference material rather than making them the sole focus of instruction.

Of these seven suggestions, the most important for MuroranIT is that teaching should concentrate on comprehensible learning tasks and activities. Low-proficiency students do not have the English ability to carry out academic catch-all activities such as “discuss this problem in a group” or “summarize and give a short presentation on this article”. Instead using detailed instructions with structured, sequential tasks, though taking longer, will nevertheless enable students to undertake intellectually challenging activities in English. This in turn requires that both content and language teachers collaborate in the establishment and running of a CBI curriculum. Neither side has the expertise to do so without the other.

Finally, we should not forget that CBI is not just a pedagogical issue; the ultimate goal of an effective CBI program is to better equip our students for their future careers. Particularly in the fields of science and engineering where English is the global lingua franca, students who, for instance, have difficulty in reading a specialized English text in their field will be linguistically limited in the amount of information they can readily access. This becomes a serious concern when they enter what even here in Japan is becoming an increasingly globalized workforce and find themselves professionally uncompetitive in comparison to graduates, both Japanese and foreign, who are comfortably adept in both content and language. Students lacking such ability will increasingly find themselves marginalized and this in turn will have a washback effect on the reputation and academic standing of MuroranIT. It therefore behoves all concerned - faculty, students and administrators - to undertake a concerted effort to introduce an effective CBI program in MuroranIT.

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