

# AN EVALUATION OF A CONTENT-BASED INSTRUCTION PROGRAM: A CASE STUDY OF MOLECULAR BIOLOGY

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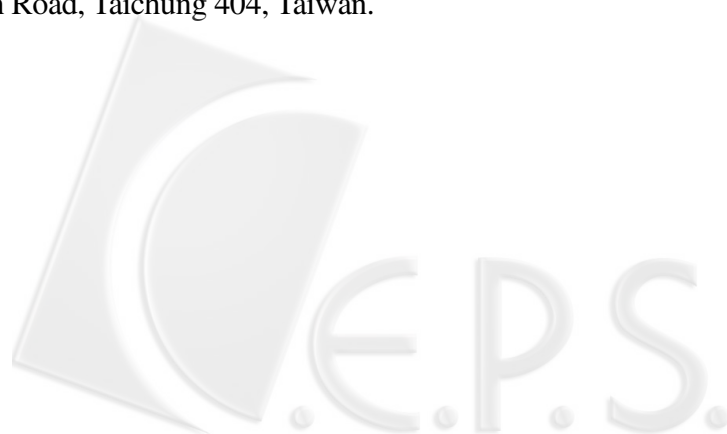
## Abstract

This study is aimed to evaluate a content-based instruction (CBI) program of a medical school in Taiwan. The CBI program was implemented for Molecular Biology, a required course for the 3<sup>rd</sup> year undergraduate students of Department of Biological Science and Technology. To collect quantitative and qualitative data, a questionnaire of 45 items was designed and distributed to the program stakeholders. Thirty-seven students and one CBI instructor completed the questionnaire. *Mean* and *Standard Deviation* of the first 42 questions were calculated. The other three items were open-ended questions, whose responses were segmented into propositions. Their frequencies were tallied and tabulated. The results showed that the stakeholders' attitude toward the program was neutral, with no strong approval or disapproval. Further examination revealed that the participants regarded the provision of the program as necessary. In addition, they were highly satisfactory with their CBI teacher, especially her performance in oral English and the use of teaching aids. The stakeholders believed the program improved their English listening ability, but not reading, writing, and speaking skills. The results also showed that the CBI instruction affected the growth of learners' content knowledge in a negative way.

Key words: Content-based instruction, Program evaluation

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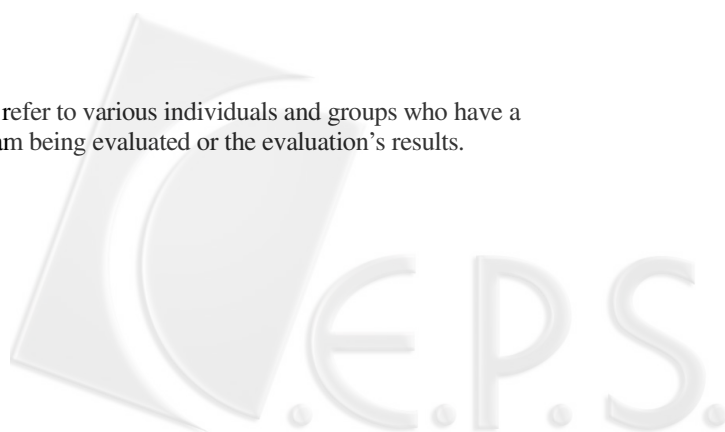
## INTRODUCTION

In recent years, content-based instruction has become more widespread in university-level settings. The term content-based instruction (CBI) refers to an approach that integrates language education with content instruction. It is in response to the emergence of English as an international language for academic texts and as a medium for instruction in countries throughout the world (Crandall & Kaufman, 2002). The trials have provided a departure from traditional curriculum and have gained in popularity in the past 10 years in ESL environments (Snow and Brinton, 1997, as cited in Chapple & Curtis, 2000) as well as in EFL contexts (Crandall & Kaufman, 2002). For example, in Taiwan, the school authorities of National Chengchi University claimed that they adopted CBI as an alternative to the conventional classes by coupling the language education with learners' academic and occupational interests. (聯合報, Oct, 11<sup>th</sup>, 2002). It is also reported that similar programs are developed in Yuan Zi University, Shih Hsin University and Taipei Medical University.

The education institutions mentioned earlier are all located in Northern Taiwan, which is characterized by metropolitan areas that are responsive to new current of pedagogical changes. In 2004, a medical school in Central Taiwan (hereafter abbreviated as MU) made attempts to catch the trend. The school mandated a tentative law to enforce a one-year practice of a CBI program in the 93<sup>rd</sup> academic year. The present study is aimed to evaluate this program. In this paper, the program is first briefly sketched, followed by the introduction to the evaluation model, evaluation tools and stakeholders<sup>1</sup>. The result of the study and discussion will then be presented in tandem with the implications and limitations of the study.

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<sup>1</sup> According to Worthen et.al (1997), stakeholders refer to various individuals and groups who have a direct interest in and may be affected by the program being evaluated or the evaluation's results.



## THE PROGRAM

According to Brinton (1989), there are three stereotypes of CBI. The first type is theme or topic-based language course which is aimed to increase the use of subject matter content in language classes. In such courses, the language class is structured around topics or themes, with the topics forming the backbone of the course curriculum. The second approach, sheltered courses, consists of content courses taught in the second language to a segregated group of learners by a content area specialist, such as a university professor who is a native speaker of the target language. The third type of content-based instruction is the adjunct model. In this model, students are enrolled concurrently in two linked courses (i.e., a language course and a content course) with the idea being that the two courses share the content base and complement each other in terms of mutually coordinated assignments. Brinton believes that it is helpful to view the three models as different points on a continuum between typical language class and mainstream class. Theme-based, sheltered, and adjunct models are defined by its proximity to either of the two ends of the continuum. On the basis of Brinton's definition, the CBI of MU is investigated.

As stated straightforwardly in the school policy, the primary aim of CBI program of the MU is to enhance students' English proficiency for the purpose of facilitating the process of globalization. According to the policy draft, each department was mandated to provide at least one CBI course. As the change was motivated from the top, the teacher recruitment proceeded rather smoothly. In the fall semester of 2004, totally 17 CBI courses were offered in MU, including 13 in the undergraduate programs, 3 in the master programs and 1 in the PhD programs. Among them, 9 were elective courses while 8 were required ones. The details are shown in Table 1.



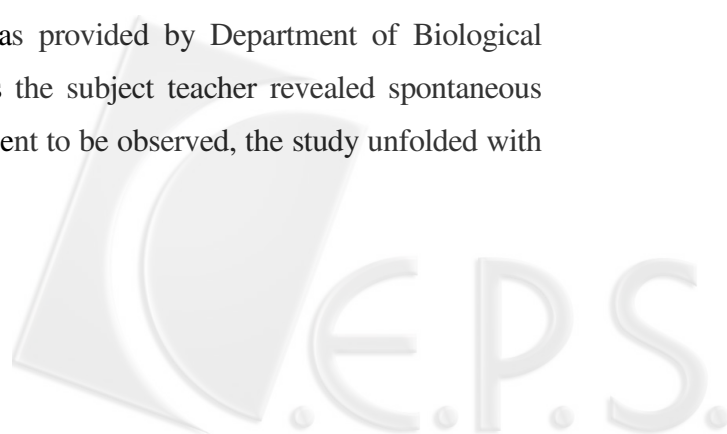
**Table 1 The number of CBI courses offered by MU**

| <b>Program offering CBI</b> | <b>number</b> | <b>elective/required</b> |
|-----------------------------|---------------|--------------------------|
| Undergraduate program       | N=13          | 7 elective; 6 required   |
| Master program              | N=3           | 2 elective; 1 required   |
| Ph. D. program              | N=1           | required                 |
|                             | Total=17      |                          |

As noted, there were more required courses than elective ones; it was probably safe to say that some students involved in the program did not join the class voluntarily at the first place. The CBI student population ranged from sophomores to first-year PhD students. They were nonnative English speakers. CBI instructors, on the other hand, were full-time, qualified university subject teachers specialized in medical or paramedical fields. Like their students, they were nonnative English speakers. There was no specified threshold for the teachers to transfer to the roles of CBI teachers. In other words, the school authorities did not set any criteria to examine the potential CBI teachers.

Considering that the revolutionary task might take extra time for lesson planning and teaching activities, the school authorities provided an incentive for the instructors, i.e., each CBI teaching hour was rewarded as one and half regular teaching hours. The bonus made it difficult to identify the underlying causes of CBI teachers' intent and commitment to the program. In other words, it was unclear whether they were motivated intrinsically, extrinsically, or both.

The course contents of the program included Chinese Medicine, Acupuncture, Practicum of Epidemiology, Molecular Biology, etc. After contacting some potential candidates for the study, the researcher decided to study a Molecular Biology class. The course was a required one that was provided by Department of Biological Science and Technology for juniors. As the subject teacher revealed spontaneous interest in the research and gave her consent to be observed, the study unfolded with



a smooth beginning. Specifically, there were 37 students and one instructor involved in the program evaluation.

The CBI program of Molecular Biology of this study was close to the stereotype of sheltered model. For one reason, the course instructor was a subject teacher. In addition, content knowledge transmission remained to be one of the primary aims of the courses. However, unlike the stereotypical sheltered aiming at intermediate to high intermediate L2 speakers, MU school authorities did not screen CBI students in terms of their English language competence in any way. On the basis of these facts, this program is regarded as an adapted sheltered CBI.

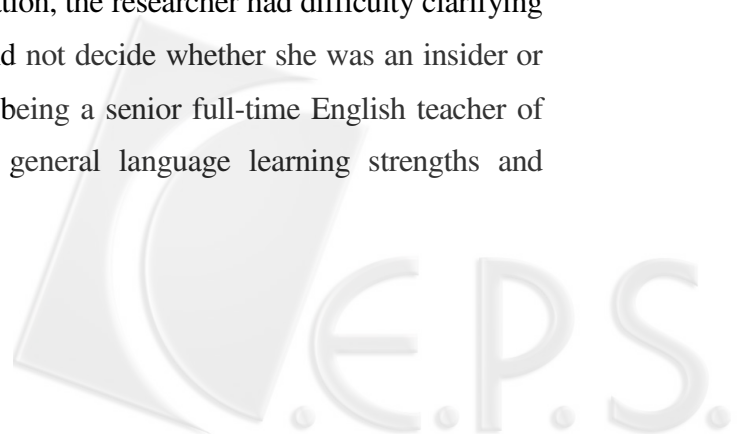
## THE EVALUATION

In the following section, the discussion revolves around the stance of the evaluator, the research questions, the evaluation models, the stakeholders of the program and the audiences of the evaluation. In addition, the evaluation tools including quantitative and qualitative tools are presented. The data analysis procedure is described as well.

### The Evaluator

In 2004, the researcher was involved in a project of Ministry of Education (MOE), which aimed to observe learners' L2 proficiency development in the language programs in higher education institutions. As an English teacher/researcher, the researcher has been interested in the impact of MU's innovative CBI program on learners' foreign language learning. In addition, there have been few studies investigating CBI program evaluation. The curriculum innovation of MU therefore became the research subject.

However, at the beginning of evaluation, the researcher had difficulty clarifying her stance. To be more specific, she could not decide whether she was an insider or an outsider evaluator. On the one hand, being a senior full-time English teacher of the university, she knew school kids' general language learning strengths and



limitations. In addition, some of the CBI teachers were active members of her social network. From this perspective, she could be classified as an insider. On the other hand, she did not participate in the CBI program planning or instruction. In fact, the program was implemented in an urban campus of MU, which is far away from the rural campus in which she works. The two school sites are about one hundred kilometers apart. In this regard, she behaved more like an outsider.

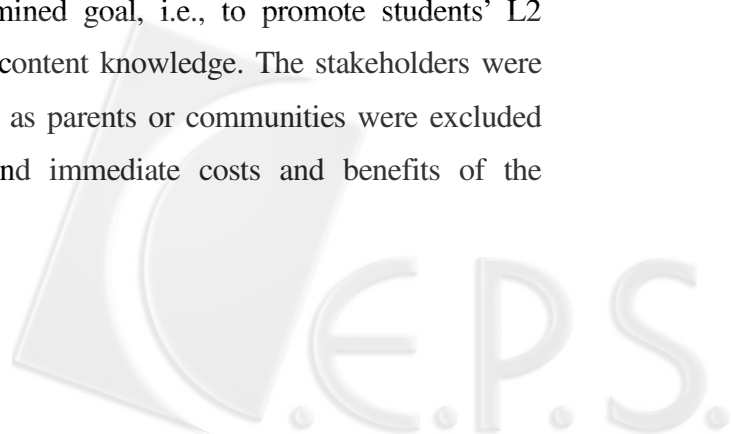
With a careful perusal of related documents, she determined to categorize the evaluation as outside evaluation, considering that the physical distance was very likely to prevent her from intensive interactions with CBI stakeholders. However, it has to be admitted that to draw a clear-cut line between these two stances is not an easy task.

In spite of the difficulty, attempts are made to explore the following questions:

- (1) Do the students have positive view toward the CBI program?
- (2) Do the students have adequate L2 proficiency levels to deal with the CBI setting?
- (3) Does students' L2 proficiency grow in the CBI setting?
- (4) Does students' content knowledge grow?

### **The Evaluation Model, Stakeholders and Audiences**

In this study, objectives-oriented evaluation approach is adopted. According to Worthen, Sanders and Fitzpatrick (1997), "the distinguishing feature of an objectives-oriented evaluation approach is that the purposes of some activity are specified, and then evaluation focuses on the extent to which those purposes are achieved" (p. 81). In other words, the evaluation involves comparing intended outcomes with actual outcomes (Beretta, 1992). As noted, the program under investigation had a clear and predetermined goal, i.e., to promote students' L2 proficiency through transmission of the content knowledge. The stakeholders were mainly CBI students. Other parties such as parents or communities were excluded because they did not receive direct and immediate costs and benefits of the



intervention

This report is intended to address the MU and MOE. The former may use the evaluation outcome as a reference to take an action to continue, terminate or modify the program. On the other hand, MOE may gain insights into the merits and limitations of CBI in the setting of post-secondary education in Taiwan.

### **The Evaluation Tools**

#### ***Tools for Quantitative Data***

The researcher designed a questionnaire to collect data from CBI instructors and students (See Appendix 1). The first part of the questionnaire was used to elicit the stakeholders' biodata. The second part of the tool consisted of 45 questions. The first forty-two items were responded by circling a five-point *Likert* scale to indicate the participants' perceptions. Among them, 34 were positive items while 9 were negative items<sup>2</sup>. The form of the questionnaire was adapted from Nunan's (1988, as cited in Lynch 1996, p. 116) classroom observation checklist.

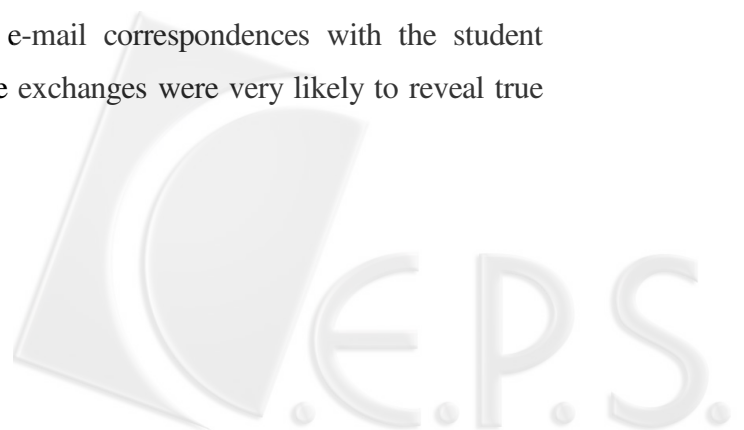
#### ***Tools for Qualitative Data***

The last 3 items of the questionnaire served as tools to collect qualitative data. They were open-ended questions intended to elicit (1) the most salient advantage of, (2) the most salient disadvantage of, and (3) suggestions to the CBI program. In addition, three student observers in the CBI class were recruited. They were responsible for keeping learning journals, recording class instructions, and collecting relevant documents such as the teacher's syllabus, handouts and files of PowerPoint. To orient the student assistants to keep journals, the researcher adapted Lynch's (1992, as cited in Lynch 1996, p. 118) REST observation form. However, the *REACTIONS FROM T/Rs* part was excluded lest it should impose an extra burden on the CBI teachers (See Appendix 2).

The researcher also collected her e-mail correspondences with the student observers and the course teacher as these exchanges were very likely to reveal true

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<sup>2</sup> They are items 6, 7, 25, 26, 30, 38, 39 and 41.



feeling of the stakeholders.

### ***Data Analysis***

The questionnaires were responded and collected on November 28, 2004, before the end of the one-semester course. Thirty-seven questionnaires were completed, collected and analyzed. For the positive items, the points were rewarded as what was responded by the *Likert* scale. For example, when 4 is circled for a given item, 4 points would be given. As for the negative items, the rewarding was done in a reverse way. For instance, a participant would be given one point if he/she circled 5. *Excel* was then used to record the numerical data and to calculate the *Mean* and *Standard Deviation* of the first 42 items.

As for the qualitative data, the subjects' responses to the three open ended questions were recorded and then segmented into propositions<sup>3</sup>, whose frequencies were tallied and counted. The purpose was to identify naturally recurring themes in the data. The other qualitative data (i.e. the observational journal, e-mail exchanges between the evaluator, the student observers, and the CBI instructor) turned out to be scarce. The limited data would be utilized only for supplementary use. Most of the qualitative data were in Chinese and would be presented in its original way. No translation was made.

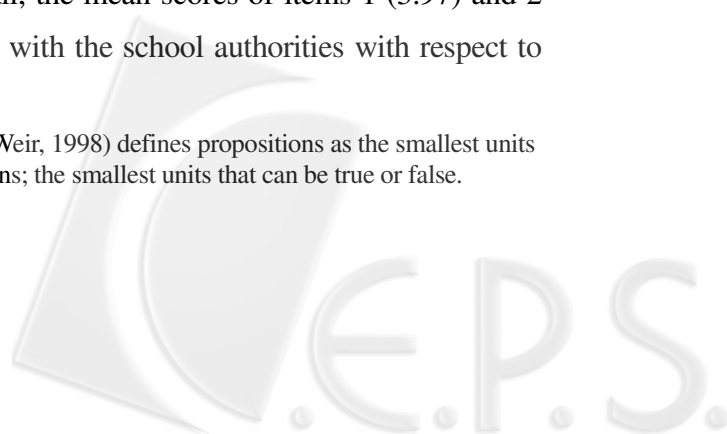
## **RESULTS AND DISCUSSION**

### **The Stakeholders' Attitude Toward the Program**

As a whole, the mean of the 42 items was 3.09 (SD=.15), which seems to indicate that participants' attitude toward the CBI program is neutral, with no strong approval or disapproval of the program. To get a fuller picture, students' responses to different items were examined. First of all, the mean scores of items 1 (3.97) and 2 (3.84) show that the participants identify with the school authorities with respect to

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<sup>3</sup> McNamara et al. (1991, as cited in Urquhart & Weir, 1998) defines propositions as the smallest units of knowledge that can stand as separate assertions; the smallest units that can be true or false.





the goal of CBI, i.e. to facilitate the process of globalization. Consistent findings were found in the qualitative data. For example, one of the student assistants wrote in his observation journal: “生物科技這個領域，西方國家，尤其是美國，仍是世界第一強國，幾乎八成的資訊都是由英文敘述。相信這樣的課對我們一定是有很大的功用的” (journal writing on Nov. 23rd). The subject teacher also regarded CBI as beneficial. She stated that “英語授課給學生很好的機會習慣英語,給學生增加外語能力的動力。對準備出國的學生,有絕對正面的幫助,讓他們提早習慣英語的環境” (Questionnaire responded on Nov. 28).

As for the CBI teacher's performance, the students' satisfaction was surprisingly high. For example, mean score of item 20 is 4.00 (SD=.12), which showed that the learners were in the opinion that their teacher's oral English was more than adequate. The mean score of item 29 is as high as 4.46 (SD=.09), which consistently shows the teacher's devotion and enthusiasm to the course. At least in the case study, the teacher plays an adequate role of CBI instructor.

### **Issues Regarding English Language**

For the first place, the participants do not agree that it was beyond their ability to deal with the CBI program, as shown by the item 38 (M=3.46/SD=.17, a negative item). In other words, they perceive themselves as linguistically competent to attend the course.

Items 9-15 were used to elicit learners' perception of the issues about English language. The mean score of item 14 (M=3.78/SD=.18) shows that the program increases the learners' awareness of the importance of the language. They recognized that there was close relationship between their language proficiency and content knowledge growth, as shown by item 15 (Mean=4.03/SD=.14). On the other hand, as a whole, their English proficiency does not have significant improvement, as indicated by the responses to item 9 (M=3.05/SD=.15). Specifically, it is pointed out that the program does not help promote the learners' reading, writing and speaking ability. However, listening ability has been sharpened, as shown by item 10 (Mean

=3.41/SD=.81). The result is supported by the qualitative data as well. By replying to the opened questions, the learners pointed out that the most salient advantage of CBI program was facilitating their development of listening skill, with 10 out of 29 information units (37%) in this regard.

As for the code-mixing of the CBI program, students agreed appropriate use of Chinese translation was helpful, which was shown by item 22 and 24 (M=4.3/SD=.14, M=4.22/SD=.13). The qualitative data also supported this finding. For example, one student observer reported,

由於內容隨著上課次數的增多一次比一次艱澀，對於很多地方，老師還是不得不用中文來敘述給我們聽，因為如果一些地方不用中文，到後面，同學們只會有更多聽不懂的，問題也會越來越大(Observation form on Nov. 23rd).

On the other hand, the stakeholders detected the negative side-effect of the program. Specifically, they pointed out that the progress of the course had suffered to a degree. As a result, the learners' content knowledge growth was negatively affected. This is the most frequently mentioned disadvantage (10 out of 34 information units, 56%) in the open-ended questions. The following quotations indicate the same problem:

同學們對全英文教學似乎還是有點吃力，所以老師上課的速度非常的慢，內容甚至一再的重複，憑良心來講，老師所能傳授的專業知識並沒有中文教學的多，因為大部分的時間都花在英文解釋某些難懂的英文單字，對於專業領域的學習，其實全英文教學幫助並不是很大。(E-mail exchange on Oct. 30th)

這是我目前寫的，真的不知道還能寫出什麼來耶....而且課堂活動真的很少，課程內容已經很多教不完力。(e-mail exchange on Nov. 29th)



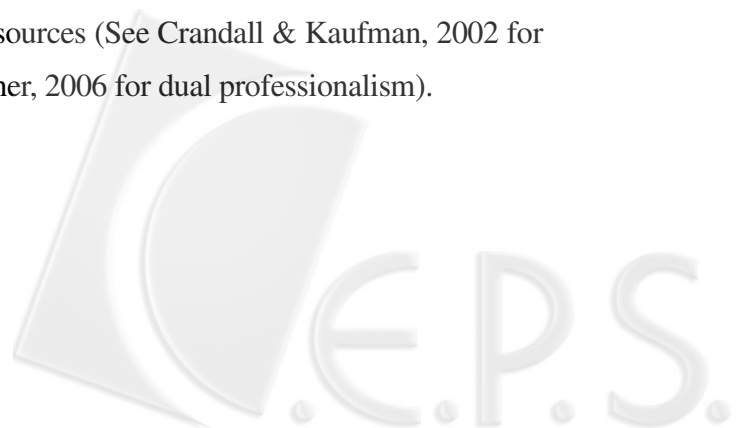
## **Pedagogical Implications**

### **1. Judicious use of first language**

As noted in the data, the CBI in a way negatively affects the content knowledge growth. CBI probably should be provided in a progressive way, i.e., the instructor should judiciously use L1 and L2, with the L1 use decreasing at an adequate rate. Atkinson (1993) notes that in a monolingual classroom, activities should be done in English as far as possible. “However, in some situations careful, limited use of the L1, at the right time, will help the students to get the maximum possible benefit from an activity” (p. 47). In other words, L1 should not be totally discarded in the CBI classroom. Judicious use of L1 probably can make the course more successful.

### **2. Collaboration with language teachers**

A distinctive feature of how English for academic purposes works is the close cooperation between subject specialists and language teachers. As T. Johns and Dudley-Evans (1980, as cited in Flowerdew & Peacock, 2001) pointed out, the problems encountered in the classroom are rarely concerned with “knowledge of the language”, or “knowledge of the subject” alone. In fact, these two factors are “inextricably intertwined” (p. 8). Snow (1997) suggests that ESP/EAP professionals can be valuable resources to subject specialists, who may not know how to help L2 learners even when they are eager to do so. Admittedly, the nature of this collaboration is far more complex than labels such as *adjunct* or *theme-based* suggest. However, in response to college and university students’ need for enhanced academic English proficiency, a diverse set of CBI involving subject specialists’ and language teachers’ collaboration should be developed, evolving to meet changing contexts, needs and resources (See Crandall & Kaufman, 2002 for new program CBI models; Belcher, 2006 for dual professionalism).



## **Limitations**

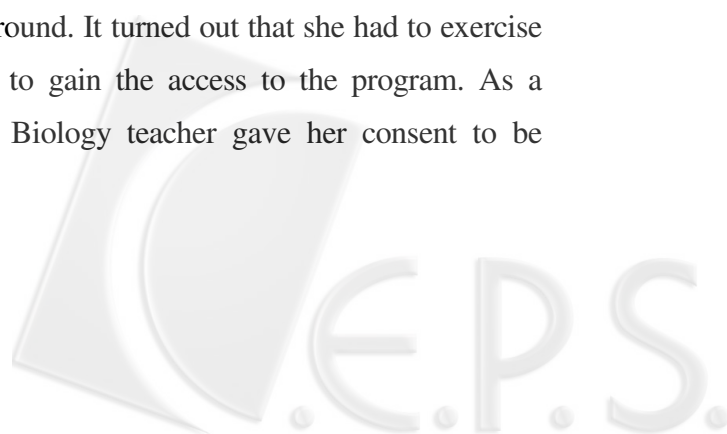
### **1. Geographical distance between the evaluator and the stakeholders**

As mentioned earlier, the program was implemented in the urban campus while the evaluator worked in a far-distanced rural campus. Although it was widely believed that internet could remove long-distance communication barriers, some of limitations of electronic communication were unexpectedly exposed in the process of data collection. For example, since the student observers and the evaluator did not meet in person on a regular basis, the observers tended to make different excuses to justify their failure of carrying out the task of data collection. Ironically, the most frequently used excuse was computer or internet breakdown. For example, one student observer said “老師抱歉，這幾天忙著書報討論都沒時間用電腦” (E-mail exchange on Oct. 30<sup>th</sup>) and “老師真抱歉，因為我們這幾個禮拜都在考試，而且電腦重灌弄了很久都沒上來開信箱” (E-mail exchange on Nov. 29<sup>th</sup>).

The evaluator could have played a more demanding role or could have dismissed the student observers. However, she recognized that it was difficult and unrealistic to recruit new members since the school semester was coming to an end. The time tide did not wait. Once the opportunities were lost, the data could never be retrieved. Therefore, the solution left was to wait patiently. The dilemma, as noted, disrupted the process of data collection and affected the evaluation process to a great extent.

### **2. Inadequate administrative support**

At the preliminary stage, the researcher expected the administrative force would facilitate the evaluation whenever needed. The reality, however, went the other way around. It turned out that she had to exercise her own personal relationship to gain the access to the program. As a matter of fact, the Molecular Biology teacher gave her consent to be



observed partly because she had personal contact with the researcher on a regular basis. As a result, the evaluator had chances to elucidate the study purpose and to earn her trust. Another factor that dispelled her resistance was that she had the intention to feature School of Medical Laboratory Science of Biotechnology by CBI program. Moreover, she was curious about the merits and limitations of the CBI course. The CBI teacher in the e-mail exchange even asked the following questions:

“我把問卷填完了

我還有幾點很好奇的

1. (其它) 老師怎麼準備教材
2. (其它) 老師會不會要求學生也用英文應答
3. (其它) 老師考試會不會用英語
4. (其它) 我們可能看到學生對這門課的反應嗎??” (E-mail exchange on Nov. 28)

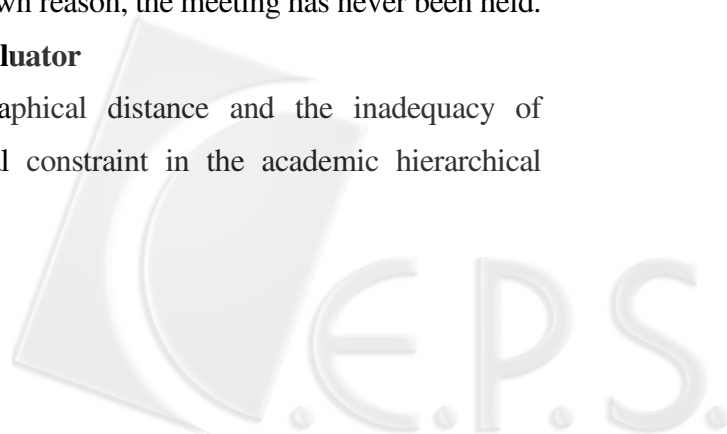
As noted, it seems that my successful recruitment of the participants should be attributed to good luck, instead of administrative support.

There was another incident which showed the administrative support of the evaluation was far from adequate. Realizing that mobilizing personal connections demanded time and efforts, in November the researcher turned to ask for help from an administrator. He promised to offer help by initiating his own personal connections. However, later he e-mailed the researcher and said “您上週提到問卷相關的問題, 而恰巧教務長也認為應找個時間大家(包括: 各子計畫主持人, 通識中心主任, 課務組....)來談一談計畫進行的情況。所以, 您可以在會議時提出需要教務處配合幫忙之處。” (E-mail exchange on Nov. 29th).

However, for some unknown reason, the meeting has never been held.

### 3. Personal constraints of the evaluator

In addition to the geographical distance and the inadequacy of administrative support, personal constraint in the academic hierarchical



structure exasperates the situation. In 2004, the researcher was a lecturer, a position with relatively limited access to resources in the higher education hierarchy. In the school setting, it is unlikely for a low-level teacher to ask for an evaluation of a high-level instructor's course just as in a social context it would be awkward for an employee to initiate an invitation to call his/her employer's first name.

Moreover, at that point, the school authorities of MU began to take stricter measures to evaluate the faculty members' production outcome. It heightened tension among the faculty members. The researcher was afraid that her evaluation might be mistaken for a school-authorized evaluation to assess faculty members' teaching performance. The misunderstanding might in turn jeopardize the researcher's social network in the school setting. The hidden worries in a way prevent her from mobilizing more personal relations to conduct a more extensive CBI evaluation in the campus.

## CONCLUSION

In this paper, the researcher first introduced the background of CBI and sketched the CBI program of MU. She then discussed the evaluator stance, the evaluation model, stakeholders, audiences and data collection tools. In addition, the dilemmas confronted were raised. The researcher also provides pedagogical implications on the basis of her data analysis. She concludes that it is necessary to provide university students with CBI courses in higher education. However, full support from school authorities, careful curriculum design (e.g. CBI as a selective course), collaboration between subject teachers and language teacher, and judicious use of L1 are beneficial factors which might maximize the success.



### Acknowledgements

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## Appendix 1 Questionnaire for CBI Students

親愛的同學：

這份問卷是用來詢問各位對專業科目英語教學的看法。由於你們是第一批接受 MU 專業科目英語教學的學生，你們的意見與建議將作為課程開設的重要參考依據，希望你們詳實回答這份問卷。你的反應不會影響你該科的成績，請放心作答。謝謝你們的合作！

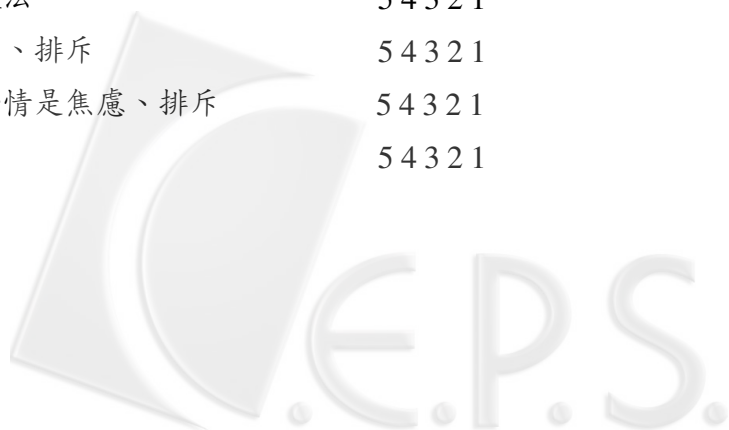
### A. 學生背景資料

1. 性別：男/女
2. 年齡 \_\_\_\_\_
3. 設籍縣/市 \_\_\_\_\_

**B. 問卷** 專業科目英文授課的英文名稱為 content-based instruction, 以下問卷只簡稱 CBI, 請同學依照下面說明圈選適當的數字

- 5-----非常同意  
 4-----同意  
 3-----沒意見  
 2-----不同意  
 1-----非常不同意

- |                              |           |
|------------------------------|-----------|
| 1. 我覺得學校有必要提供 CBI            | 5 4 3 2 1 |
| 2. 我覺得 CBI 可以促進國際化，讓我們與世界接軌  | 5 4 3 2 1 |
| 3. 在 CBI 課程遭遇問題時，校方有提供我必要的協助 | 5 4 3 2 1 |
| 4. 我感受到校方努力想把 CBI 做好         | 5 4 3 2 1 |
| 5. 我肯定校方以 CBI 來改革課程的做法       | 5 4 3 2 1 |
| 6. 我知道自己要上 CBI 時心情是焦慮、排斥     | 5 4 3 2 1 |
| 7. 班上其他同學知道要上 CBI 時的心情是焦慮、排斥 | 5 4 3 2 1 |
| 8. 我是自願上 CBI 的               | 5 4 3 2 1 |



|                                      |           |
|--------------------------------------|-----------|
| 9. 目前這門 CBI 對我的整體英文能力有幫助             | 5 4 3 2 1 |
| 10. 目前這門 CBI 對我的英文聽力有幫助              | 5 4 3 2 1 |
| 11. 目前這門 CBI 對我英文的口語表達能力有幫助          | 5 4 3 2 1 |
| 12. 目前這門 CBI 對我的英文閱讀能力有幫助            | 5 4 3 2 1 |
| 13. 整體而言，目前這門 CBI 對我的英文寫作能力有幫助       | 5 4 3 2 1 |
| 14. 上過 CBI 之後，讓我體認到英文的重要性            | 5 4 3 2 1 |
| 15. 英文程度與 CBI 的專業知識吸收有密切關係           | 5 4 3 2 1 |
| 16. CBI 對我的專業知識增進有幫助                 | 5 4 3 2 1 |
| 17. 我的教師的 CBI 授課能力適當                 | 5 4 3 2 1 |
| 18. 我的教師對自己的 CBI 授課方式有信心             | 5 4 3 2 1 |
| 19. 我的 CBI 教師對 CBI 課程方式抱持肯定的態度       | 5 4 3 2 1 |
| 20. 我的 CBI 教師的英文口語表達能力適當             | 5 4 3 2 1 |
| 21. 我的 CBI 教師使用中文說明的情況約為 20% 以下      | 5 4 3 2 1 |
| 22. 我覺得 CBI 課程應有適度的中文解說              | 5 4 3 2 1 |
| 23. 我的 CBI 課程教師遇到專業術語時會提供中文翻譯        | 5 4 3 2 1 |
| 24. 我覺得專業術語的中文翻譯可以幫助我對課程的理解          | 5 4 3 2 1 |
| 25. 老師怕我們聽不懂，常常重複講解                  | 5 4 3 2 1 |
| 26. 因為用英文授課，我們上課的進度變得很慢              | 5 4 3 2 1 |
| 27. 我的 CBI 教師給我們充分的時間做英文討論活動         | 5 4 3 2 1 |
| 28. 我的 CBI 教師給我們充分的時間發問              | 5 4 3 2 1 |
| 29. 老師會利用 PowerPoint、教具或圖解讓我理解他的授課內容 | 5 4 3 2 1 |
| 30. 我的 CBI 授課教師英文講解的速度太快             | 5 4 3 2 1 |
| 31. 我們的課程教材是特別為 CBI 課程中設計的           | 5 4 3 2 1 |
| 32. 我會提供重點，讓學生事先預習                   | 5 4 3 2 1 |
| 33. 我覺得 CBI 的優點多過缺點                  | 5 4 3 2 1 |
| 34. 如果有選擇，以後我願意再選修 CBI 課程            | 5 4 3 2 1 |
| 35. 我知道其他學校也有 CBI                    | 5 4 3 2 1 |
| 36. 我認識其他學校上 CBI 課程的同學               | 5 4 3 2 1 |



- 
- |                                       |           |
|---------------------------------------|-----------|
| 37. 我為沒有上到 CBI 課程的同學感到惋惜              | 5 4 3 2 1 |
| 38. 我覺得自己的英文程度上不足以應付 CBI              | 5 4 3 2 1 |
| 39. 我覺得上 CBI 的同學英文能力應該經過檢定篩選          | 5 4 3 2 1 |
| 40. 我常常聽不懂老師授課的重點                     | 5 4 3 2 1 |
| 41. 這門課讓我感到挫折                         | 5 4 3 2 1 |
| 42. 大部分 CBI 的缺點可以透過經驗累積得到改善           | 5 4 3 2 1 |
| 43. 到目前為止我覺得 CBI 最大的優點是_____          |           |
| 44. 到目前為止我覺得 CBI 最大的缺點是_____          |           |
| 45. 針對 CBI 課程的其他建議(含教材、課程、教師、設備)_____ |           |



**Appendix 2 Forms of observation journal for the CBI student observers****Observation Journal**

授課日期：\_\_\_\_\_

觀察者姓名：\_\_\_\_\_

授課時間：\_\_\_\_\_

地點：\_\_\_\_\_

( ) 1. 教師使用英語授課比例：

(1) 非常多 (2) 多 (3) 普通 (4) 少 (5) 極少

( ) 2. 教師使用英語作授課以外活動比例：

(1) 非常多 (2) 多 (3) 普通 (4) 少 (5) 極少

( ) 3. 學生使用英語參與教學活動（如討論）的比例：

(1) 非常多 (2) 多 (3) 普通 (4) 少 (5) 極少

授課內容：

課堂活動：

觀察者感想：



Appendix 3 Mean and Standard Deviation of the 42 Items

| 題數         | 平均數  | 標準差  | 題數         | 平均數  | 標準差  |
|------------|------|------|------------|------|------|
| <b>1.</b>  | 3.97 | 0.11 | <b>26.</b> | 2.08 | 0.16 |
| <b>2.</b>  | 3.84 | 0.16 | <b>27.</b> | 2.62 | 0.14 |
| <b>3.</b>  | 3.95 | 0.20 | <b>28.</b> | 3.43 | 0.15 |
| <b>4.</b>  | 2.76 | 0.17 | <b>29.</b> | 4.46 | 0.09 |
| <b>5.</b>  | 3.22 | 0.17 | <b>30.</b> | 3.38 | 0.13 |
| <b>6.</b>  | 3.05 | 0.16 | <b>31.</b> | 2.46 | 0.15 |
| <b>7.</b>  | 2.86 | 0.14 | <b>32.</b> | 2.35 | 0.14 |
| <b>8.</b>  | 2.78 | 0.21 | <b>33.</b> | 3.03 | 0.16 |
| <b>9.</b>  | 3.05 | 0.15 | <b>34.</b> | 3.76 | 0.10 |
| <b>10.</b> | 3.41 | 0.18 | <b>35.</b> | 3.19 | 0.19 |
| <b>11.</b> | 2.49 | 0.14 | <b>36.</b> | 2.86 | 0.18 |
| <b>12.</b> | 2.97 | 0.16 | <b>37.</b> | 1.95 | 0.13 |
| <b>13.</b> | 2.22 | 0.13 | <b>38.</b> | 3.46 | 0.17 |
| <b>14.</b> | 3.78 | 0.18 | <b>39.</b> | 2.70 | 0.17 |
| <b>15.</b> | 4.03 | 0.14 | <b>40.</b> | 2.65 | 0.21 |
| <b>16.</b> | 3.11 | 0.17 | <b>41.</b> | 3.05 | 0.13 |
| <b>17.</b> | 3.86 | 0.13 | <b>42.</b> | 2.73 | 0.18 |
| <b>18.</b> | 3.46 | 0.15 | <b>平均</b>  | 3.09 |      |
| <b>19.</b> | 3.73 | 0.16 |            |      |      |
| <b>20.</b> | 4.00 | 0.12 |            |      |      |
| <b>21.</b> | 3.32 | 0.17 |            |      |      |
| <b>22.</b> | 4.3  | 0.14 |            |      |      |
| <b>23.</b> | 4.00 | 0.16 |            |      |      |
| <b>24.</b> | 4.22 | 0.13 |            |      |      |
| <b>25.</b> | 1.65 | 0.10 |            |      |      |



**Appendix 4 Frequency counts of the responses  
to the three open-ended questions**

| 優點         | 總計 |
|------------|----|
| 幫助聽力提升     | 10 |
| 提供英文學習環境   | 5  |
| 增加接觸英文機會   | 5  |
| 提升英文能力     | 3  |
| 對專業術語敏感度提升 | 2  |
| 提升閱讀能力     | 1  |
| 訓練耐心       | 1  |
| 可以多修一次     | 1  |
| 領悟英文的重要性？  | 1  |

| 缺點            | 總計 |
|---------------|----|
| 進度緩慢拖時間       | 10 |
| 內容難理解不易吸收     | 9  |
| 專業內容過多不易以英文表達 | 5  |
| 易忽略重點         | 2  |
| 內容容易被簡化       | 2  |
| 對專業名詞陌生       | 1  |
| 學生無法應付        | 1  |
| 老師爆走          | 1  |
| 學生素質參差        | 1  |
| 中文式英文出現       | 1  |
| 造成互動不良上課過程混亂  | 1  |

| 建議 | 總計 |
|----|----|
|    |    |



|               |   |
|---------------|---|
| CBI 開在選修課     | 8 |
| 加開英文選修課程輔助    | 3 |
| 上課教材簡易份量減少    | 3 |
| CBI 開在非專業科目   | 2 |
| 輔以中文解釋        | 2 |
| 增加英文的互動與討論    | 2 |
| 師資不足          | 1 |
| 在有語音設備教室      | 1 |
| 課程不要排在上午      | 1 |
| 應循序漸進而非直接全英教學 | 1 |
| 每堂課提出評估並呈報學校  | 1 |



## 學科性輔導教學課程評量： 分子生物學之個案研究

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### 摘 要

本研究旨在評量台灣某大學之學科性輔導教學(Content-based instruction, CBI) 課程。受觀察的課程為生物科技系三年級之必修課程「分子生物學」。研究者設計一份四十五題之問卷發給修課學生；共有三十七位學生以及一名教師參與問卷調查。前四十二題分數之平均值與標準差由 Excel 之敘述統計算出。後三題為開放式問題，研究者將答案區分為命題主張(proposition)，再計算其出現頻率，繼而整理出自然出現之主題(naturally recurring themes)。研究結果顯示學生對該課程整體沒有呈現強烈的反對或贊成傾向。進一步分析發現學生大抵認同 CBI 課程有其必要性，並對其 CBI 任課教師表現出高度肯定，特別是該任課教師之英文口說能力與相關教具使用。學生亦指出該課程有益於提升英文聽力，對說、寫、讀三種語言技巧則無幫助。研究結果同時也指出 CBI 因進度緩慢，對專業知識的吸收有負面影響；學生並建議 CBI 最好開在選修課。研究者建議 CBI 教師適度使用中文解說，並與語言教師各取所長，彼此合作。

關鍵字：學科性輔導教學、課程評量

