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Foreword

Welcome to the Spring 2010 issue of *The Asian ESP Journal* Spring! It is our pleasure to publish six selected papers addressing a range of ESP issues in a range of genres from English language course, academic research writing, research article introductions, to argumentative writing; and in a diverse disciplines including engineering, medical and computer.

The first paper featured in this edition is entitled 'Investigating the English language needs of petroleum engineering students at Hadhramout University of Science and Technology'. Atef Saleh Al-Tamimi and Munir Shuib identify students' needs and perceptions on English language skills by means of a questionnaire survey and conclude that the current course is not appropriate to the students. The study has important pedagogical implications that may help improve the English language course offered to the petroleum engineering students.

Yanling Hwang and Siouzih Lin's 'A study of medical students' linguistic needs in Taiwan' uses a questionnaire survey to identify and compare the linguistic needs and perceptions held by three groups in the medical field, namely faculty, students of junior years and students of senior years. The article also discusses some issues relating to English in the medical field such as the frequency of the use, importance of the language, students' proficiency, assistance or requirements for students, and the English curriculum for the School of Medicine.

In the third article 'Integrating product, process and team teaching in writing instruction', Carmel Heah and Sujata S Kathpalia describe a joint project between Nanyang Technological University and Stanford University, and discuss the advantages of adopting an integrative three-dimensional approach (process, product and team-teaching) to teaching writing of discipline-specific academic genres in a technical communication course. The study finds that such approach develops students' metacognitive skills regarding genre-stability and genre-change, which are necessary for them to be immersed into the research culture and practices of their disciplines.

Yan Zhang and Jiyue Hu's 'A genre-based study of medical research article introductions: A constructive analysis between Chinese and English' is a corpus-based study of twenty English and twenty Chinese introductions of academic medical research articles. The study employs Swales' CARS model and has identified major differences between the two corpora in terms of macro-structural and micro-linguistic features. The article discusses the differences based on social and cultural factors.

Afnan H Fatani's paper entitled 'Electronic syllabus design for *Language & Computers*: Bridging the gap between two disciplines using *Moodle* as a Learning Management System (LMS)' presents the rationale, procedures, and results of designing and structuring a graduate level linguistics course that aims to bridge the gap between Language & Computers and Computational Linguistics. The paper also shows how to convert the delivery of the course from face-to-face to online or blended delivery using *Moodle* as a course management system.

Fei-Wen Cheng's 'A socio-cognitive modeling approach to teaching English argumentation' reports on the effectiveness of the use of a socio-cognitive modeling approach to teaching argumentative writing in English. Both textual analysis of students' writing and questionnaire results show that the approach has helped EFL learners compose effective arguments in their writing.

We hope you will enjoy reading the articles in this Spring issue and find some of the findings useful for your teaching and research activities. We look forward to receiving your contributions in the future!



Investigating the English Language Needs of Petroleum Engineering Students at Hadhramout University of Science and Technology

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Biodata

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Abstract

In engineering education, specific English language skills are needed to enable engineering students to succeed in academic settings (Tan, 1999; Pendergrass et al., 2001; Sidek et al., 2006; Venkatraman & Prema, 2007). To determine what students need to achieve through the medium of English accurately, it is imperative to carry out a Needs Analysis (NA) (Hutchinson & Waters, 1987; Robinson, 1991; Hyland, 2006). NA is defined as “the process of determining the needs for which a learner or group of learners requires a language and arranging the needs according to priorities” (Richards & Platt, 1992, p. 242). With such views, this paper reports on a survey conducted to investigate the English language needs of petroleum engineering students at Hadhramout University of Science and Technology (hereinafter HUST).

More specifically, the study aims to identify the students' perceptions of the frequency of English language skills used, the importance of these skills, their ability in performing the skills, the areas of language use that they need training/teaching in, and their preferences for the English language course. A total of 81 third, fourth, and final-year petroleum undergraduates in the academic year 2006-2007 were identified and approached for the process of NA. A questionnaire was used for data collection. The results stressed the significance of English for petroleum engineering students and identified the students' lacks, wants and necessities with regard to English language skills. The paper concludes with pedagogical implications that may help improve the current English language course based on the students' needs.

Keywords: Needs Analysis (NA), English for Specific Purposes (ESP), and English for Science and Technology (EST)

1. Introduction

Previous research in the field of engineering showed that English language is of paramount importance in the academic and professional lives of engineering students (Basturkman, 1998; Pendergrass et al., 2001; Pritchard & Nasr, 2004; Joesba & Ardeo, 2005; Sidek et al., 2006; Hui, 2007; Venkatraman & Prema, 2007). For example, Pendergrass et al. (2001) pointed out that English is an essential tool in engineering education, and therefore "integrating English into engineering, science and math courses is an effective way to improve the performance of engineering students in oral and written communication" (p. 1). In addition, Pritchard & Nasr (2004, p. 426) emphasised that "English is of particular importance for engineering and science students because it is the principal international language of science and is looked upon as an effective means for enabling those students to become familiar with professional texts written in English". Similarly, Joesba & Ardeo (2005) stated that as English has become the *de facto* international language of science and technology, engineering students have to face this fact while they are students, since books, papers, handbooks, journals, etc. written in English are included in their reading lists, and after graduation, because one of their most valuable resources will be English at the labour market.

However, at HUST, its petroleum engineering students have been described as low-competent in the English language (Al-Tamimi & Shuib, 2008a). Al-Tamimi and

Shuib's views were based on preliminary interviews with some English language teachers at HUST and some petroleum graduates, who graduated from the Faculty of Petroleum and Engineering (hereinafter FPE). They thought that the petroleum students complete their study without any benefit from the English language course they have taken at the FPE. This is because, according to them, the petroleum graduates still face a lot of difficulties in using the language. As a result of their poor performance in English, most of the petroleum graduates have been rejected when applying for work with oil companies. In this regard, the former Yemeni Minister of Oil and Minerals, Mr. Khaled Bahah, stated that applicants, who graduated from the FPE, always find it difficult to join oil companies because of their language problems, and therefore he advised these graduates to improve their English to increase opportunities for getting jobs (http://www.mom.gov.ye/ar/news_53.htm).

There are many factors that might have caused the students' low proficiency in English. One is the English language curriculum offered to the Petroleum Engineering students. According to Al-Fadly (2004, p. 17), the English language courses at most faculties in HUST "are not developed on the basis of an analysis of the English language needs of the undergraduates", and as a result, he argued that the students have not got the benefits they need from such courses. To address this problem, a decree was issued by the Hadhramout Governorate's Local Council, stating that an urgent study should be done to evaluate the current curriculum in the FPE at HUST. Given this, Al-Tamimi & Shuib (2008a), in their evaluation of this curriculum, found that it is more related to General English (GE) than to English for Specific Purposes (ESP) and therefore more removed from the students' needs. This indicates that designing a syllabus suitable for the petroleum students is an urgent need. In this account, many researchers (Hutchinson & Waters, 1987; Nunan 1988; Robinson, 1991; Dudley-Evans & John, 1998; Kavaliauskiene & Užpaliene, 2003; Chen, 2006; Jiajing, 2007; Al-Tamimi & Shuib, 2008b) argue that identifying students' needs should be the first step in designing an ESP syllabus. Along this line, the researchers were inspired by the problems explained earlier to carry out a case study to explore the petroleum engineering students' English language needs.

2. Literature review

There is a plethora of research that has been carried out internationally in NA. In Malaysia, for example, studies were conducted to investigate English language needs

of ESP students (e.g. Chin, 2004; Rahim, 2005; Stapa & Jais, 2005) and employees at the workplace (e.g. Kaur, 1993; Lee, 2003; Shuib, 2005; Kaur & Hua, 2006). NA research was not restricted, however, to Malaysia as some studies have been reported in China (e.g. Xiao, 2006), Hong Kong (e.g. Chew, 2005), Hungary (e.g. Kormos et al., 2002), India (e.g. Dayal, 2005; Venkatraman & Prema, 2007), Japan (e.g. Kikuchi, 2004; Cowling, 2007), Pakistan (e.g. Khan, 2007), South Africa (e.g. Jackson et al., 2006), and the United States (e.g. Zhu & Flaitz, 2005). All these studies confirmed the importance of identifying learners' needs and showed the risk and dangers of ignoring NA in designing ESP courses.

With regard to Arab EFL learners' needs, a number of NA studies have been undertaken. For instance, in Jordan, there was a study conducted by Zoghoul & Hussein (1985) on language needs of undergraduate students from different disciplines, including natural sciences, engineering, medical sciences, economics, administrative sciences, and arts and humanities. The study examined the perceptions of both students and staff members. Results obtained from this study showed extensive use of English as reported by both students and teachers. More interestingly, the findings revealed that the students overestimated their language abilities, whereas faculty members gave a more realistic assessment of the students' capabilities. Another NA research carried out in Jordan was by Al-Khatib (2005). The study sought to examine communication needs in English in tourism and banking and to identify workers' attitudes toward English and the use of English in the workplace. The findings revealed that English communication skills were very important for tourism and banking workers though the former needed these skills more than the latter. In addition, it was found that positive attitudes of almost all of the respondents in both workplaces towards using the English language for achieving multiple purposes. On the basis of his results, Al-Khatib concluded that in designing ESP courses for tourism and banking undergraduates, it is of great importance to include workplace communication needs. Basturkmen (1998) reported on NA research done in the College of Petroleum and Engineering at Kuwait University. The study looked at student needs in seven departments, i.e. petroleum, chemical, electronic, computer, mechanic, industrial, and civil engineering. The findings proved the importance of English for engineering students' academic needs. In an Egyptian College of Technology, a research project was performed by Pritchard and Nasr (2004) to develop materials to help improve third-level engineering students' reading

performance. As a first step in the project, an NA was carried out to find what the undergraduates and their teachers might perceive as major required reading skills. This list of skills was then used as the basis for developing a reading improvement programme. To evaluate the effectiveness of the programme, it was tested with a group of 66 students. Results of the experimental study revealed that the programme helped improve the subjects' performance in reading. Regarding the ESP teachers' role in the engineering department, the findings emphasised that instead of being the primary information providers, ESP teachers should assimilate subject concepts from learners and negotiate meaning with them. Abu-Rizaizah (2005) carried out a study to design a writing course for a group of engineers working at the Saudi Electrical Company (SECO) based on an analysis of the students' needs. Based on the findings, the researcher determined the outline of a technical writing course by identifying its aims, objectives, and content to meet electrical engineers' English language needs at the workplace.

Regarding the Yemeni EFL context, the main focus of the reported NA studies was either medical students (Bin-Tayeh, 1996; Abdullah, 1999; Al-Fadly, 2004; Abdullah, 2005) or English majors (Al-Muslimi, 2004; Al-Haddad & Shuib, 2005; Farae, 2005). The first reported study among medical students was that of Bin-Tayeh (1996). He explored language needs of medical students in Sana'a University as perceived by medical undergraduates, lecturers, and graduates. The results emphasised that reading and writing were mostly needed in both academic studies and professional commitments. Abdullah (1999) investigated language needs of secondary school graduates who wish to join the Medical Faculty in the University of Aden. The findings showed that the subjects needed not only medical English but also GE to enable them to use the language in communicative situations. The results also revealed that the English language course offered by the Institute of Languages did not meet the students' language needs. Based on the findings, the researcher proposed a pre-sessional Medical English course. Al-Fadly (2004) aimed at identifying language needs of medical students at HUST as perceived by the students and their teachers. The study also aimed at offering some suggestions for the improvement of English language courses at the Faculty of Medicine. Both students and teachers agreed that listening and speaking skills are the most important skills in medical studies. Thus, the researcher suggested that improving medical undergraduates' communication skills should be given more attention in designing their English

language programme. Abdullah (2005) conducted another study to find out language needs of first-year students at the Medical College of Aden University. As the subjects' responses revealed that the implemented ESP materials did not match their entire present and future needs, Abdullah provided a proposed schema for medical English courses based on the students' needs.

An NA of English majors' academic and professional needs was conducted by Al-Muslimi (2004) in the English Department, Faculty of Education, Sana'a University. The author studied the perceptions of students and teachers of the English department, teachers of English at Al-Amana (Sana'a) schools, and inspectors of English in Al-Amana Educational office. The findings indicated that all these groups of people agreed upon 64 statements—covering linguistic, literary, communicative, pragmatic, and social needs—as important academic and professional needs of English undergraduates. Al-Haddad & Shuib (2005) reported on a study that investigated current and future language needs of English majors in Seiyun Faculty of Education at HUST. Responses of the undergraduates revealed that they needed English for academic study and they expected to need English more in teaching after graduation. In contrast with the undergraduates' expectations of their future language needs, the graduates' responses showed that those who work as teachers used English less frequently than those who work in other jobs. The teachers in the English Department had the view that enhancing the undergraduates' ability in performing the four English language skills is required to meet their present and future language needs. Based on the findings, Al-Haddad & Shuib (2005) gave some recommendations for reviewing the curriculum and improving the teaching process in the English Department.

Given the discussions of relevant NA studies, it is found that the Faculty of Petroleum Engineering at HUST, the only one of its kind in Yemen, would benefit from a NA study. This lack in the literature, besides the urgent needs to design a syllabus, motivated the researchers to conduct an NA to identify the target needs of petroleum engineering students at HUST. The study reported here was also motivated by Kandil's (2002) observation about Arab EFL learners. He said that these EFL learners “rarely have input in their language teaching context” (Kandil, 2002). This is because, Kandil argues, the learners' needs have not yet “received sufficient attention from researchers and language teaching professionals in the Arab World” (ibid).

Given the situation that highlighted the gap in the literature of NA research in the Arab World, the next section will present how the current study was carried out.

3. Research Design

This study aims at investigating the English language needs of the petroleum engineering students at HUST on the basis of their perceptions. Therefore, the study addresses the following five questions:

1. How frequently are the English language skills used by the petroleum engineering students at HUST?
2. How important are the English language skills to the petroleum engineering students at HUST?
3. What are the petroleum engineering students' English language lacks?
4. What are the petroleum engineering students' English language wants?
5. To what extent does the English language course relevant to the petroleum engineering students?

The design of the study was based on Hutchinson & Waters's (1987) target needs approach to NA. "Target needs", according to Hutchinson & Waters (1987), is an umbrella term which includes learners' necessities (their target linguistic features), lacks (their target linguistic features minus what they already know), and wants (what the learners feel they want and need). By looking at learner's necessities one can identify "the demands of the target situation, that is, what the learner has to know in order to function effectively in the target situation" (p. 55). Then what they lack should be studied to understand the gap between their target and existing proficiency. Brindley (1989) stated that "theories of adult learning indicated that adults learn better when programme content is geared to their immediate concerns, language teaching tended to concentrate on the end-product: the actual language which learners had to use" (p.70). Once necessities and lacks have been identified, Hutchinson & Waters (1987) believe that learners' wants and their views about the reasons why they need a language should not be ignored as they may "have a clear idea of the necessities of the target situation [and] will certainly have a view as to their lacks" (p. 56). Chen (2005) highlights the importance of including necessities, lacks, and wants in the analysis process of learners' target needs, stating that "by looking at learners' background

situation, lacks, necessities and wants, we recognized that the individual participants have their own general and specific needs both objectively and subjectively...This significant identification of needs became the basis of the course design” (p.2).

Hutchinson & Waters’s approach to NA offers "a useful classification of needs which may be seen to reflect differing viewpoints and give rise to different forms of NA” (West, 1994, p.3). In addition, according to Mason (1994), “Hutchinson & Waters provide a more manageable framework for analysing the target situation and also a parallel framework for analysing learning needs” (p. 1). This justifies the use of this model as it is thorough, manageable, well-known, and appropriate and has been recommended by many scholars and researchers (e.g. Kaur, 1993; Mason, 1994; West, 1994; Basturkmen, 1998; Chin, 2004; Al-Haddad & Shuib, 2005; Al-Khatib, 2005; Chen, 2005; Rahim, 2005; Shuib, 2005; Hyland, 2006; Kaur & Hua, 2006).

Zhu & Flaitz (2005) said that studies focusing on ESL/EFL students' target needs by the approach of task analysis have provided useful information about the academic tasks students are expected to perform and the materials they must work with in university content classrooms. In the same vein, Orr (2001) mentioned that among the variables that NA of ESP will identify is a list of relevant skills that “learners must master in order to successfully accomplish the specific academic or workplace purposes for which they seek specialized training” (p. 208). Given this, Basturkmen's (1998) list of English task/skill types was adopted due to its appropriateness and applicability in the current investigation. The list consists of 22 language sub-skills: 8 for reading (e.g. reading course handouts), 6 for writing (e.g. writing lab reports), 5 for listening (e.g. listening to instructions and explanations in labs), and 3 for speaking (e.g. participating in discussions).

Accordingly, to investigate the petroleum students’ English language necessities, the researchers tried to find out their perceptions of the frequency of their use of the English language skills and the importance of these skills to them. To analyse the subjects’ lacks, information to assess the students’ ability in performing the language skills was elicited. Finally, the students’ wants were determined by investigating the amount of training that they would like to receive to improve their language skills.

3.1 Participants

The target student population in this study was all the students who studied in the academic year 2006-2007 in the Department of Petroleum Engineering (hereinafter DPE) at HUST, Yemen. The total number of the students was 191 males. There were no female students in the department.

The DPE provides five years of instruction that qualifies the students to graduate with a BA degree in petroleum engineering. English is the medium of instruction in the department. In addition, an English language course is taught to all the petroleum engineering students over two semesters in their first year.

There are three reasons for selecting the petroleum engineering students in this study:

1. These students would definitely have specific and many views regarding their target language needs as they are one of the pillars in the teaching and learning process. As Long (2005) stated, using students as informants seems an obvious choice, and they are often the “primary, sometimes the only, respondents” (p. 19).
2. Their wishes, wants and desires are of paramount importance in any NA research as reflected in many studies (e.g. Hutchinson & Waters, 1987; Dudley-Evans & John, 1998; Long, 2005; Hyland, 2006).
3. To draw conclusions based on the students’ perceptions is an essential step in the learner-centred approach to course design (Nunan, 1988), which recently becomes the most used approach among researchers and curriculum developers (Tudor, 1996).

Only 81 third, fourth and fifth-year petroleum engineering students, aged 21 to 26 years old, were selected as a sample to fill in the questionnaire designed to elicit responses to their target needs. Students in these three levels were chosen because they were expected to have sufficient knowledge about their language needs as they had studied for more than two years at the DPE. In addition, these students had already taken the English language course during their first year of study. First and second-year students were excluded on the grounds that inexperienced students “should not be expected to make sound language decisions concerning their needs” (Drobnic, 1978, as cited in Chambers, 1980).

3.2 Instrument

In this study, a questionnaire was used as the only method of enquiry. It was composed of seven sections, namely sections A, B, C, D, E, F, and G.

Section A of the questionnaire requested general background information regarding the subjects' age, gender, and level of study.

Sections B, C, D, E, and F were designed to identify the students' perceptions regarding their English language skill needs. More specifically, in section B, the subjects were required to state perceptions regarding their use of 22 English language sub-skills, namely reading (items 1 to 8), writing (items 9-14), listening (items 15-19), and speaking sub-skills (items 20-22). A five-point Likert-scale (1=never and 5=always) was used.

Sections C and D were developed to assess the subjects' ability to perform 8 language skills, adopted from Shuib (2005), and 22 language sub-skills, which were used in section B. In the former section, the respondents were requested to rate their proficiency in the eight English language skills, where 5, 4, 3, 2, and 1 refer to very good, good, average, weak, and very weak respectively. To evaluate their ability in performing the 22 sub-skills, a rating scale was used, in which 5 means very efficient, 4 efficient, 3 somewhat efficient, 2 not very efficient, and 1 not efficient at all.

In sections E and F, the researchers made use of the same 22 sub-skills in section B to elicit the participants' perceptions regarding the importance of these skills to them and their needs for training to improve performance in these skills. While five ratings (1 implies "not important" and 5 "very important") were used in the former section, only four-point scale (1 being "no training needed" and 4 "a lot of training") was used in the latter section.

The last section of the questionnaire (section G) was developed, based on Kaur's (1993) work, to elicit the subjects' perceptions regarding the appropriateness of the current English language course. Four questions were asked in this section. The first question aimed at identifying the usefulness of the English language course with regard to the students' English language needs. A five-point Likert scale was used ranging from 1 (very useful) to 5 (not useful). The second question asked the subjects of their views regarding the language aspects of the course that they would suggest having training/teaching in. In this regard, they were requested to select which appeal to them from a list of 9 options, including grammar, technical vocabulary, general vocabulary, listening comprehension, reading comprehension, speaking skills, writing

skills, communication skills, and others to specify. The subjects were given the freedom to choose more than one option. For the third question, the participants were requested to specify their preferences for the type of English language course that they would like to attend. They were provided with four choices: English for Academic Purposes (EAP), English for Occupational Purposes (EOP), General English (GE), and others to specify. They were informed that they can select more than one choice. Lastly, the subjects were required to state whether they were satisfied with the time, or one year, allocated to the English language course. They were requested to specify their answers with “Yes” or “No”.

The researchers translated the questionnaire into Arabic, and then it was submitted for language approval to the Hadhramout University's Language Centre. To ensure its validity, the researcher tested the questionnaire in a pilot study prior to carrying out the main study. On the basis of the outcome of the pilot study, the questionnaire was amended and the final draft was prepared for the main study.

3.3 Procedure

In May 2007, the researchers started carrying out the main study at the DPE in the FPE at HUST. Before administering the questionnaire, the researchers met with two lecturers who were teaching the third, fourth, and fifth-year students. For each of the levels, a class time was given to the researchers to conduct the study. During the study, the students in each group were informed of the objectives and significance of the research. They were also requested to state real and honest responses. In addition, they were acknowledged for the time they would spend in filling in the questionnaire. Moreover, the subjects were allowed to ask for any clarifications they might need. Then the questionnaire was distributed. Once they finished answering the questionnaire, they were requested to check their responses for incompleteness or missing answers.

4. Results

This section will present the participants' responses to the questionnaire. The section is divided into two main sub-sections: the students' English language needs and their preferences for the English language course.

4.1 The Students' English Language Needs

This sub-section comprises four parts. The first and second parts deal with the frequency of the subjects' use of the English language skills and the importance of these skills. The third part illustrates their lacks in the language. Finally, data regarding their training needs will be presented.

4.2 Students' Frequency of English Language Skill Use

Table 1 below shows the results obtained from section B of the questionnaire, regarding the use of the English language sub-skills by the students.

Table 1: Students' frequency of English language skill use

	English language skills	No.	Mean	SD	Overall mean
Reading sub-skills	1) Reading textbooks	81	3.5432	.98805	3.2515
	2) Reading technical articles in journals	81	2.4568	.97531	
	3) Reading technical manuals	81	2.4321	1.03608	
	4) Reading course handouts	81	4.2222	.85147	
	5) Reading texts on the computer	81	3.0123	1.17786	
	6) Reading instructions for assignments/projects	81	3.2840	1.17510	
	7) Reading instructions for labs	81	3.4198	1.04719	
	8) Reading study notes	81	3.6420	.95274	
Writing sub-skills	9) Writing lab reports	81	4.0000	1.06066	3.2695
	10) Writing assignments	81	4.2593	.91894	
	11) Writing field-trip reports	81	1.8519	1.09671	
	12) Writing short projects	81	2.4815	1.22588	
	13) Taking notes in lectures	81	3.4321	1.25438	
	14) Writing test/exam answers	81	3.5926	1.05804	
Listening sub-skills	15) Following lectures	81	3.7654	1.13216	3.4666
	16) Following question/answer sessions in class	81	3.3704	1.22927	
	17) Listening to spoken presentations	81	3.1975	1.17707	
	18) Listening to instructions and explanations in labs	81	3.3827	1.19967	
	19) Listening to instructions for assignments	81	3.6173	1.26063	
Speaking sub-skills	20) Participating in discussions	81	2.6420	1.06429	2.3745
	21) Asking questions in class	81	2.3951	1.03294	
	22) Giving spoken presentations	81	2.0864	1.08625	
	23) Others (please specify)				

Of the four language skills, the overall means in Table 1 above show that listening skills (overall mean=3.4666) have been perceived to be the most frequently

used skill by the students, followed by writing (overall mean=3.2695) and reading (overall mean=3.2515). On the other hand, speaking skills have been viewed by the students to be the least frequently used skill, as such skills received the lowest mean scores (overall mean=2.3745).

Among the sub-skills of listening, it was found that following lectures (mean=3.7654) and listening to instructions for assignments (mean=3.6173) were perceived to be most often used. The remaining listening sub-skills, i.e. listening to instructions and explanations in labs (mean=3.3827), followed by question/answer sessions in class (mean=3.3704) and listening to spoken presentations (mean=3.1975), were viewed to be used less.

Regarding reading sub-skills, the results indicated that the most frequently used skill was reading course handouts with a mean of 4.2222, followed by reading study notes (mean=3.6420), reading textbooks (mean=3.5432), reading instructions for labs (mean=3.4198), reading instructions for assignments/projects (mean=3.2840), and reading texts on the computer, , , (mean=3.0123). On the other hand, the least frequent reading sub-skills used are reading technical articles in journals (mean=2.4568) and reading technical manuals (mean=2.4321).

For the writing sub-skills, the results showed that the students often write assignments and lab reports, and they sometimes write test/exam answers and take notes in lectures. However, they viewed writing projects and field-trip reports to be the least frequent sub-skills used.

The findings also revealed that while the students sometimes participate in discussions (mean=2.6420), they rarely ask questions in class (mean= 2.3951) or make spoken presentations (mean=2.0864).

4.3 Importance of English Language Skills

This sub-section highlights the results elicited from section E of the questionnaire, regarding subjects' views of the importance of the English language skills. Table 2 summarizes the descriptive statistics of the results.

Table 2: Importance of English language skills to the students

	English language skills	No.	Mean	SD	Overall mean
Reading sub-skills	1) Reading textbooks	81	4.6790	.62903	4.1851
	2) Reading technical articles in journals	81	4.1111	.83666	
	3) Reading technical manuals	81	3.5802	.99830	
	4) Reading course handouts	81	4.6049	.71901	
	5) Reading texts on the computer	81	3.8148	.96321	
	6) Reading instructions for assignments/projects	81	4.2222	.83666	
	7) Reading instructions for labs	81	4.1605	1.00569	
	8) Reading study notes	81	4.3086	.76880	
Writing sub-skills	9) Writing lab reports	81	4.2840	.88367	4.1399
	10) Writing assignments	81	4.4815	.74349	
	11) Writing field-trip reports	81	3.7531	1.24027	
	12) Writing short projects	81	3.9383	1.05292	
	13) Taking notes in lectures	81	4.1481	.89598	
	14) Writing test/exam answers	81	4.2346	.81043	
Listening sub-skills	15) Following lectures	81	4.4444	.68920	4.2839
	16) Following question/answer sessions in class	81	4.2346	.85545	
	17) Listening to spoken presentations	81	4.2222	.85147	
	18) Listening to instructions and explanations in labs	81	4.2222	.88034	
	19) Listening to instructions for assignments	81	4.2963	.88663	
Speaking sub-skills	20) Participating in discussions	81	4.1235	.96673	4.0411
	21) Asking questions in class	81	4.0494	1.03563	
	22) Giving spoken presentations	81	3.9506	1.09432	
	23) Others (please specify)				

Notice that all the items in Table 2 have high mean scores that range from 3.5802 to 4.4444, except for reading textbooks and course handouts which score higher at 4.6790 and 46049 respectively. This indicates that the subjects perceived all the English sub-skills to be important to acquire.

4.4 The Students' English Language Lacks

This section presents the subjects' responses to sections C and D of the questionnaire, which focus on areas of difficulty in the English language that were common for students in their area of specialization. In particular, the informants were asked to first rate their proficiency in the English language and secondly evaluate their ability to perform the English language sub-skills. Tables 3 and 4 show the results.

4.5 The Students' English Language Proficiency

In terms of self-evaluation of performance in the English language, the students' ratings vary from one skill to another as shown in Table 3 below.

Table 3: Students' proficiency in the English language

English Language Skill	No.	Mean	SD
Speaking	81	2.6296	.95452
Listening	81	2.6790	1.02258
Writing	81	3.6296	.90062
Reading	81	3.4321	.94787
Grammar	81	3.0247	1.04851
Vocabulary	81	3.0741	.97183
Pronunciation	81	3.0617	.97910
Communication	81	2.4321	.94787

As shown in the above table, the subjects' responses indicated that their level in all the English language skills is either average or weak. They rated their performance in writing, reading, vocabulary, pronunciation, and grammar skills to the average level of mean scores, 3.6296, 3.4321, 3.0741, 3.0617, and 3.0247 respectively. Their perceived performance was lower for listening (mean=2.6790), speaking (mean=2.6296), and communication skills (mean=2.4321).

4.6 The Students' Lacks in the English Language Sub-skills

While Table 3 presents the participants' self-assessment of their proficiency in the English language macro-skills, Table 4 illustrates their self-ratings of their ability in performing the English language sub-skills.

Table 4: Students' self-ratings of their ability in the English language sub-skills

	English language skills	No.	Mean	SD	Overall mean
Reading sub-skills	1) Reading textbooks	81	3.7407	.73786	3.4845
	2) Reading technical articles in journals	81	3.1111	.80623	
	3) Reading technical manuals	81	2.9136	.86887	
	4) Reading course handouts	81	4.1111	.80623	
	5) Reading texts on the computer	81	3.3086	.91709	
	6) Reading instructions for assignments/projects	81	3.5309	.82290	
	7) Reading instructions for labs	81	3.5062	.90999	
	8) Reading study notes	81	3.6543	.83905	
Writing	9) Writing lab reports	81	3.7901	.93161	

sub-skills	10) Writing assignments	80	4.0000	.82677	3.3724
	11) Writing field-trip reports	81	2.4691	1.08497	
	12) Writing short projects	81	2.9136	1.06299	
	13) Taking notes in lectures	81	3.5185	.97610	
	14) Writing test/exam answers	81	3.5432	.94933	
Listening sub-skills	15) Following lectures	80	3.5500	.99238	3.4521
	16) Following question/answer sessions in class	80	3.3500	1.03239	
	17) Listening to spoken presentations	80	3.2000	1.01133	
	18) Listening to instructions and explanations in labs	81	3.5185	.89598	
	19) Listening to instructions for assignments	81	3.6420	.89873	
Speaking sub-skills	20) Participating in discussions	81	3.0494	.97341	2.8683
	21) Asking questions in class	81	2.9383	.99179	
	22) Giving spoken presentations	81	2.6173	1.06733	
	23) Others (please specify)				

The overall means presented in Table 4 indicated that the subjects estimated their ability to perform almost all the language sub-skills to be somewhat efficient. However, while their estimation increased at the "reading course handouts" and "writing assignments" sub-skills, with mean values of 4.1111 and 4.0000 respectively, the means decreased regarding their efficiency in "asking questions in class" (mean=2.9383), "reading technical manuals" (mean=2.9136), "writing short projects" (mean=2.9136), "giving spoken presentations" (mean=2.6173), and "writing field-trip reports" (mean=2.4691).

4.7 The Students' English Language Wants

Given the subjects' self-rating of their lacks in the English language skills, this subsection presents their wants of the amount of training they would like to receive to improve their skills. The results from section F of the questionnaire are shown in Table 5 below.

Table 5: Students' wants of language training

	English language skills	No.	Mean	SD	Overall mean
Reading sub-skills	1) Reading textbooks	81	3.2099	.91810	3.0293
	2) Reading technical articles in journals	81	3.1481	.85310	
	3) Reading technical manuals	81	2.9506	.90693	
	4) Reading course handouts	81	2.9630	1.06589	
	5) Reading texts on the computer	81	3.1235	.91355	

	6) Reading instructions for assignments/projects	81	3.0988	.94346	
	7) Reading instructions for labs	81	2.9259	.99722	
	8) Reading study notes	81	2.8148	1.06197	
Writing sub-skills	9) Writing lab reports	81	3.0123	.91507	3.0699
	10) Writing assignments	81	2.9630	.98036	
	11) Writing field-trip reports	81	3.3457	.91050	
	12) Writing short projects	81	3.4321	.83574	
	13) Taking notes in lectures	81	2.7654	1.05204	
	14) Writing test/exam answers	81	2.9012	1.06777	
Listening sub-skills	15) Following lectures	81	2.9136	1.09770	3.0962
	16) Following question/answer sessions in class	81	3.0370	1.00554	
	17) Listening to spoken presentations	81	3.3086	.95710	
	18) Listening to instructions and explanations in labs	81	3.1728	.98476	
	19) Listening to instructions for assignments	81	3.0494	.98617	
Speaking sub-skills	20) Participating in discussions	81	3.4444	.90830	3.3703
	21) Asking questions in class	81	3.2840	.91152	
	22) Giving spoken presentations	81	3.3827	.91608	
	23) Others (please specify)				

The students' interest in receiving training in speaking and listening is slightly stronger than writing and reading. Table 5 shows that all the subjects' choices regarding speaking and listening tasks have mean scores higher than 3.0, except for following lectures (mean=2.9136). On the other hand, a number of reading and writing skills have mean values less than 3.0, such as reading course handouts (mean=2.9506), writing assignments (mean=2.9630), reading technical manuals (mean=2.9506), reading instructions for labs (mean=2.9259), writing test/exam answers (mean=2.9012), reading study notes (mean=2.8148), and taking notes in lectures (mean=2.7654). However, regardless of the slight differences in the mean scores, the subjects' perceptions can still be considered, to some extent, high regarding the amount of training they would like to get to improve their English language sub-skills.

4.8 The Students' Perceptions regarding the English Language Course

Given the results obtained from sections B, E, C, D and F of the questionnaire regarding the students' language needs, this sub-section presents their responses to section G of the questionnaire, with regard to their preferences for the English

language course. More specifically, their perceptions of the usefulness of the course in meeting their needs, the language elements that should be covered in it, its type and the time allocated to it, are presented.

To elicit information regarding the students' perceptions of the current English language course, the researchers asked the following four questions:

1. How useful is the English language course with regard to your English language needs?
2. Which aspects of the English language course would you suggest that you should have training/teaching in?
3. Which type of English language course would you like to attend?
4. Is the time allocated to the English course enough to you to use the language effectively?

The subjects' responses to the above questions are presented in tables 6, 7, 8, and 9.

Table 6: Students' results regarding the usefulness of the English language course

Questionnaire Item	Choices	Total (n=81)	%
How useful is the English language course with regard to your English language needs?	Very useful	4	4.9
	Useful	1	1.2
	Of some use	17	20.9
	Of little use	28	34.5
	Not useful	31	38.2

The results in Table 6 reveal that the majority of the students responded negatively to the usefulness of the English language course in terms of meeting their English language needs: 38.2% and 34.5% of them stated that the course is "not useful" and "of little use" respectively.

To answer the second question (Which aspects of the English language course would you suggest that you should have training/teaching in?), the subjects were provided with a list of language skills and requested to indicate which of the skills appeal to them. A student could select more than one option. Therefore, the percentages in Table 7 below refer to individual choices indicated by the respondents.

Table 7: Students' results regarding the language aspects of the English language course

Questionnaire item	Choices	Total (n=81)	%
Which aspects of the English language course would you suggest that you should have training/teaching in? (You can choose more than one)	Grammar	31	38
	Technical vocabulary	37	45.6
	General vocabulary	31	38
	Listening comprehension	56	69
	Reading comprehension	40	49.3
	Speaking skills	78	96.2
	Writing skills	41	50.6
	Communication skills	66	81.4
	Others (please specify)	-	-

It is clear from the above table that almost all (96.2%) of the students stated that the priority should be given to speaking skills. 81.4% of the subjects had the view that communication skills should be another important element to be covered in the English language course. Listening comprehension skills come next, as perceived by 69% of the subjects.

The third question was about the subjects' preferences for the type of English language course they would like to attend. They were given four choices: EAP, EOP, GE, and others. The results are presented in Table 8 below.

Table 8: Students' English language course preferences

Questionnaire item		Total (n=81)	%
Which type of English language course would you like to attend?	English for academic purposes (EAP)	44	54.3
	English for occupational purposes (EOP)	73	90.1
	General purpose English (GE)	21	25.9
	Others (please specify)	-	-

As shown in the above table, the majority (90.1%) of the subjects preferred to take courses in English for Occupational Purposes (EOP).

The last question aimed at getting feedback from the students about their satisfaction of the time allocated to the English language course. The subjects' answers are presented below in percentages.

Table 9: Students' satisfaction of the time allocated to the English language course

Questionnaire item	Yes		No	
	<i>n=81</i>	%	<i>n=81</i>	%
Is the time allocated to the English course enough to you to use the language effectively?	6	7.4	75	92.5

It is clear that the vast majority of the respondents (92.5%) stated that the time allocated to the English language course was not enough to reach the required level in the English language.

5. Discussions

This section attempts to discuss the findings of the present study. The results of the students' English language needs and their perceptions of the English language course will be discussed separately.

5.1 The Students' English Language Needs

The results, in terms of the three distinctions (necessities, lacks and wants) of Hutchinson & Waters's (1987) target needs framework, are discussed in this subsection.

Firstly, regarding the petroleum engineering students' English language necessities, the findings reveal that there are many English language sub-skills that the students have to know in order to function effectively in the target situation. This was evident from the results depicted in Tables 1 and 2, which present the frequency of English language skill use and the importance of these skills respectively. Hence, the English sub-skills used most frequently by the students are: writing assignments, reading course handouts, writing lab reports, following lectures, reading study notes, listening to instructions for assignments, writing test/exam answers, and reading textbooks. Interestingly enough, all the language skills have been perceived by the subjects to be important to acquire regardless of being used frequently or not. However, there was an agreement in perceiving listening skills to be number one in terms of both frequency of use and importance. These results are to a great extent consistent with those of Basturkman (1998). He found that ten skills and tasks were

perceived by the students and their teachers as the most important skills for engineering students. Those skills are: reading textbooks, writing lab reports/lab assignments, following lectures, reading instructions for labs and assignments, listening to instructions for labs and assignments, reading course and lecture handouts, note taking in lectures, listening to presentations and participating in the discussion, preparing projects, and preparing answers to questions from textbooks. Moreover, the findings of the current investigation confirmed the significant role of English as a lingua franca in the engineering community as demonstrated by previous researchers (e.g. Pendergrass et al., 2001; Pritchard & Nasr, 2004; Joesba & Ardeo, 2005; Sidek et al., 2006; Hui, 2007).

Secondly, in terms of lacks in the English language, the subjects' self-ratings in Tables 3 and 4 are indicative of their general feeling that they do not have an adequate level of English ability. For example, in Table 3 the results show that while the subjects perceived themselves as being at the average level in writing, reading, vocabulary, pronunciation, and grammar skills, they rated themselves to be weak in listening, speaking, and communication skills. Furthermore, the subjects extended their weaknesses to include the English language sub-skills as well. The results in Table 4 indicate that they are somewhat efficient in performing almost all the language sub-skills. More significantly, although listening, reading, and writing sub-skills are frequently used by the students, their perceived level of performance in these skills is not satisfactory.

Finally, the results in Table 5 indicate the subjects' wants of training to develop their ability in the English language. Consistent with the self-ratings of their ability in performing the English language skills, the students demonstrated greater interest in receiving training in speaking and listening than writing and reading.

5.2 The Students' Perceptions of the English Language Course

Given the discussion of the results on English language needs, this sub-section discusses the subjects' perception of the English language course.

Learners' perceptions of the appropriateness of the English language course they take would be of more importance than the perceptions of other stakeholders, as Nunan (1989) noted that "the effectiveness of a language program will be dictated as much by the attitudes and expectations of the learners as by the specifications of the official curriculum" (p. 176). In line with this, this study revealed that the current

English language course is highly removed from the petroleum engineering students' language needs. In other words, the highest percentages of the subjects voiced negative views to the usefulness of the English course, as shown in Table 6.

Raluca (2002) asserted that ESP learners are current or future specialists who need English for their specific area and who are aware of their needs. He then added that these learners know exactly what they need English for and that they know what the ESP course should offer them. Given this, the majority of the subjects in the present study had the perception that speaking, communication, and listening skills should be given priority when designing an ESP course. In addition, the results indicated that EOP is the preferred type of English course that the students would like to take. This might be a result of the fact that the students would like to improve job-related skills in order to be able to function effectively in the workplace, where English is the medium of communication.

Finally, the findings showed that most of the subjects had the view that one year is not enough for the English course to help them gain proficiency in the language. This might be consistent with their English language lacks and their awareness and desire to attend more training courses, as discussed in the previous sub-section.

6. Conclusions and recommendations

This research identified the petroleum engineering students' English language needs in terms of the frequency of their use of English language skills, their English language lacks, the importance of these skills, and their English language wants. In addition, the study illustrated the students' perceptions of the current English language course and what course they preferred to take.

The findings elicited from the five research questions offer a perspective from which to identify "the gap between what is and what should be" (Brindley, 1989, p. 65) with regard to the petroleum engineering students' language needs. For example, in response to the first and second questions (sections B and E of the questionnaire), although the subjects perceived listening, reading, and writing sub-skills to be most frequently used, they considered almost all the language skills to be important to acquire. Such results reveal the students' awareness of the importance of English, which has become the dominant language used in engineering education. Answers to the third question (sections C and D of the questionnaire) indicate that most of the

students surveyed felt that they cannot use English effectively. Along the same line, they expressed the opinion that they would like continued instruction and training to improve proficiency in all the language skills. This confirms the seriousness of the need of petroleum engineering students in a non-native context to develop specific language skills which would help them function effectively in their target domain.

Concerning the last research question (section G of the questionnaire), the students' responses show that the English language course does not meet their language needs. And the time allocated to the course is not enough to enable them to use the language efficiently. Moreover, the subjects preferred to take EOP courses and stressed that due emphasis should be given to speaking, communication, and listening skills when the course is designed. Such results are consistent with Hyland's (2006) observation in that ESP courses "rarely provide enough time to meet all identified needs, nor adequate time to collect and analyse needs data, which means that teachers typically write their courses on the basis of incomplete information" (p. 74).

The research found that proficiency in English is serious and does need to be treated urgently. This is because, as in many countries, in Yemen the English language is an essential requirement in the academic domain and the workplace. In addition, English language courses taken by petroleum students did not enable them to use English effectively. Thus the students do need assistance based on their needs and wants. Abu-Rizaizah (2005) believes that satisfying learner's needs and interests has an important influence on their motivation to learn and therefore achievements. Similarly, Rayan (2007) stated that the involvement of ESP learners in designing their own courses will enhance their interest and motivation, foster critical thinking skills, make them take part in various language activities enthusiastically, and result in effective learning. He also emphasised that such a step would make the teaching-learning process enjoyable and pave the way for achieving course objectives. These claims point out a necessity to design a new syllabus to meet the students' needs. So the following recommendations might help in designing an English language course for the petroleum engineering students at HUST:

1. The perceived needs should be translated into pedagogic terms. In other words, when designing the English language course, ESP teachers should take into consideration learners' needs by focusing on all the language skills, with greater emphasis on speaking and listening.

2. The syllabus does not need to be revamped but had better be changed to suit students' needs. It should match what the students learn with what they will face in their academic and professional domains.
3. An elementary or a low-intermediate syllabus would be more appropriate to meet the level of proficiency of the students. As Shuib (2008) said, "students must receive comprehensible input in English; input which they can understand" (p.168).
4. The students' needs, difficulties, and motivation should be given much more attention when ESP courses are prepared and developed.
5. The duration and number of courses should be increased so that English becomes an essential course at the FPE.

To sum up, the current study explored petroleum engineering students' English language needs. The researchers concur with Richards et al. (1985) in that conducting an NA research would help to "identify general to specific language needs, which can be addressed in developing goals, objectives and content for a language programme [and] provide data which can serve as the basis for reviewing and evaluating an existing programme" (p. 7). As such, besides identifying learners' needs, the findings show that the current language course is not appropriate to the students. It is hoped that results and recommendations of this study could serve as guidelines to what should be done in the review and re-development of the ESP curriculum offered to the petroleum engineering students at HUST.

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A Study of Medical Students' Linguistic Needs in Taiwan

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Abstract

English plays an essential role in medical students' studies because almost all medical knowledge is in English. In addition, medical students have to learn to write patient charts, medication prescriptions and orders in English in their future medical career. Due to these reasons, English for Medical Purposes (EMP) seems to be paramount. Therefore, the English language that medical professionals need in their medical career is not only English for General Purposes (EGP), but also English for Medical Purposes. This study aims to provide a description of the linguistic needs and perceptions of medical students and faculty members in Taiwan. The following issues are discussed: (1) frequency of the use of English by medical students, (2) importance of using English in the medical field, (3) evaluations of medical students' proficiency in English, (4) needs analysis of the English course for the School of Medicine, (5) suggestions for improving the English curriculum for the School of Medicine, and (6) other assistance or requirements for medical students' linguistic needs. Participants

were 378 medical students selected from the Department of Medicine at Chung Shan Medical University, including 117 freshmen, 79 sophomores, 59 juniors, 79 seniors, 44 fifth graders and 24 faculty members. The quantitative analysis of the questionnaires was conducted through descriptive statistics. Chi-square and one-way ANOVA analysis were also conducted in order to determine the perceptions of linguistic needs of medical students and to compare the perceptions held by the three groups: faculty (F), lowerclass group (LC) and upperclass group (UC).

Key Words: EMP, ESP, Needs Analysis, Curriculum Design, College English

1. Introduction

English is accepted globally as a lingua franca used for international communication (Coury, 2001; Crystal, 2003; Jenkins, 2004; Kurfürst, 2004; Schwarz, 2003; Seidlhofer, 2005; Yang, 2006). It is also accepted as an international language of communication in many fields, including medical science. English is essential for medical professionals as the world has become internationalized (Kang, 2004) and because almost all the medical information which medical students need to access is in English. As proposed by Kurfürst (2005), English is the most vital tool for medical students. For instance, they need to use English in their studies, which are for reading journals and textbooks when preparing for exams, or for discussion in class or at medical meetings. Furthermore, they have to learn to write patient charts, medication sheets, prescriptions and orders in English during their training and in their future medical careers. Hence, English for Medical Purposes (EMP) has become important.

The English language that medical professionals need in their medical career is not only English for General Purposes (EGP), but also EMP, a kind of ESP (English for Specific Purposes). Van Naerssen (1978) explains EMP as a form of English as a Second Language education that clearly emphasizes teaching aspects of medical English according to the needs of the job: for writing progress notes and charting, interviewing and assessing patients, and providing oral and written reports (as cited in Hull, 2006). Hence, *what* and *how* to teach English to medical students are critical issues, considering their future needs in the medical profession.

When discussing EMP courses, we should consider the medical students' needs in their future career and their communication needs in various medical communication situations (Hull, 2004). To better understand needs analysis, as

claimed by Kavaliauskien and Užpalien (2003), the cornerstone of successful learning is a learner-centered approach which addresses learners' wants and needs for carrying out a variety of communicative tasks in the target language. Therefore, information about the ways in which learners prefer to learn must be obtained through a needs analysis exercise. As a result, the learner-focused curriculum which speaks to student motivation and student success focuses on the learning needs and future goals of the student.

It has been observed that very few studies have been carried out in the area of EMP in Taiwan. This study therefore aims to provide a description of the linguistic needs and perceptions of medical students and faculty members in Taiwan. To achieve the purpose, this study proposes six main objectives of this research under the following headings: (1) frequency of the use of English by medical students, (2) importance of using English in the medical field, (3) evaluations of medical students' proficiency in English, (4) needs analysis of the English course for the School of Medicine, (5) suggestions for improving the English curriculum for the School of Medicine, and (6) other assistance or requirements for medical students' linguistic needs.

2. Literature Review

2.1 An Overview of English Education at Medical Universities in Taiwan

The purpose of this research is to evaluate the linguistic needs and perceptions of medical students in Taiwan. The course design for medical or English studies should be related to the development of communication skills for students. Medical school students should study both English for General Purposes (EGP) and English for Medical Purposes (EMP) courses. Table 1 below has been shown the actual English courses offered at different medical schools in Taiwan.

Table 1
English Courses Offered in Six Universities: Seven-year Program (2007 academic year)

School	English Courses	Academic Year					Total Credits	Category		Course Feature
		1	2	3	4	5-7		EGP	EMP	
National Taiwan University							6			
	Foreign Language	✓					6	✓		✓
Taipei Medical University							7			
	English Oral-aural Training	✓					2	✓		✓
	English Reading	✓					2	✓		✓
	English Reading and Writing	✓					2	✓		✓
	Medical English	✓					1		✓	✓
Chang Gung University							8			
	English	✓					6	✓		✓
	Advanced Medical English	✓					2		✓	✓
Chung Shan Medical University							9			
	English Reading II	✓					2	✓		✓
	English Conversation	✓					2	✓		✓
	Medical English	✓					2		✓	✓
	English Listening		✓				2	✓		✓
	English Writing for Medical Record			✓			1		✓	✓
China Medical University							4			
	English	✓					4	✓		✓
Kaohsiung Medical University							8			
	English Reading and Writing	✓					4	✓		✓
	English Listening and Speaking	✓					2	✓		✓
	Medical English	✓					2		✓	✓

Note: 1. This table was adapted and compiled from the websites of the medical schools above.
 2. EGP = English for General Purposes, EMP = English for Medical Purposes
 3. R = Required, E = Elective

With regard to the EGP courses, all medical universities in general offer 6 credit hours of required EGP courses each week, especially focusing on listening, speaking and reading abilities. It should be noted that, except for National Taiwan University and China Medical University, four among six universities provide the required EMP courses. This indicates the necessity of ESP courses (Anthony, 1997; Gatehouse, 2001; Hutchinson & Waters, 1987; Lee, 2005; Liaw, 2002). Furthermore, almost all of the EMP courses are offered in the second of the seven academic years. One possible reason is that most medical schools offer preparation courses for medicine and core curriculum, such as Biology, Psychology, Physics, Calculus,

Chemistry and Nutrition for medical students in their first academic year. EMP courses, which focus on medical terminology, should therefore be taught later.

In summary, the majority of universities in Taiwan offer required EGP courses in the first three of seven academic years, concentrating mostly on listening, speaking and reading skills. As for the EMP courses, four out of six universities provide students with one to three credits of required EMP courses after the first academic year. Chung Shan Medical University is the university that provides the most English courses which include EGP and EMP courses with a total of 9 credits; In contrast, China Medical University offers the least English courses with a total of 4 credits.

2.2 English for Specific Purposes (ESP)

Hutchinson and Waters (1987) pointed out that there are three main historical terms of English for Specific Purposes (ESP): the demands of a Brave New World, a revolution in linguistics, and a focus on the learner (as cited in Gatehouse, 2001; Liaw, 2002; Yang, 2006). The key factor is the third, as Hutchinson and Waters (1987) put it: "ESP is an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning" (p. 19). To conclude, ESP courses are based on a needs analysis, which shapes the teaching methodologies and teaching materials to meet learners' needs or goals. Liaw (2002) suggested that ESP learners are mainly at the tertiary level of education and have already received some basic ESL or EFL education. To them, English is a medium for learning other subjects.

There have been a number of studies on English for Medical Purposes (EMP) within the field of English for Specific Purposes (ESP). These studies address the English needs of medical students in China (Xu & Xiao, 2006; Zhuo, 1989), language problems of international medical doctors who work in the hospitals in America (Anne, 2004; Cameron & Williams, 1997), the relationships between a non-native English-speaking physician's pronunciation and a nurse's perception of his medical competency (Horani, 1995), the teacher's role in teaching EMP (Chang, 2007) and English needs of medical school students in Taiwan (Chia, 1999; Fang, 1987; Shen, 1996). Chang's (2007) study found the following: "We notice that attention to learners' needs is a key element in any definition of ESP. Therefore, EMP is intended to help a medical student who is planning to study medicine in English. It is assumed that this medical student will have some knowledge of general English but limited experience of studying works in medical English" (p. 2).

Chia (1999) carried out an English needs analysis on 349 college students and 20 faculties at Chung Shan Medical School in Taiwan and the freshman English course was an elective course at that time. The freshman English course has now become a requirement for medical students at Chung Shan Medical University. Furthermore, Chung Shan Medical University even provided medical students with required English courses in their first four of seven academic years. Accordingly, it is worthwhile to resurvey linguistic needs and perceptions of medical students and faculty members at Chung Shan Medical University which is the university that currently provided medical students with the most English courses in Taiwan. In addition, the contributions of this study which make this study an improvement over Chia (1999) are the last two parts of the questionnaire that were not discussed by Chia (1999): (1) Qs 20 - 24 included five items that aimed to find out the linguistic needs, learning styles and activities to examine students' satisfaction of the English course and gather their opinions for future curriculum design, and (2) Qs 25 - 26 were designed for the understanding of the graduation requirement in English, and the courses being delivered in English have been currently promoted at Chung Shan Medical University to enhance students' proficiency in English. Participants were asked about these two issues.

3. Methodology

○ 3.1 Participants

The participants were 378 medical students in the Department of Medicine at Chung Shan Medical University, including 117 freshmen, 79 sophomores, 59 juniors, 79 seniors, 44 fifth graders and 24 faculty members. The participants involved in this study were further categorized into three groups: faculty (F), lowerclass group (LC) and upperclass group (UC). Lower-class group are medical students in the first, second, and third year. The upper-class refers to seniors and the fifth year medical students.

○ 3.2 Instrument

The method used to carry out this study was a questionnaire survey, which included close-ended questions to collect quantitative data. The design of the questionnaire was based on two earlier survey instruments by Chia (1999) and Yang (2006). The questionnaires were translated into Chinese, piloted, and modified according to

feedback from five medical students from Chung Shan Medical University. This questionnaire (see Appendix) given to medical students consisted of 25 questions and was divided into seven categories: (1) the demographic information, (2) frequency of the use of English by medical students, (3) importance of using English in the medical field, (4) evaluations of medical students' proficiency in English, (5) needs analysis of the English course for the School of Medicine, (6) suggestions for improving the English curriculum for the School of Medicine, and (7) other assistance or requirements for medical students' linguistic needs. The faculty questionnaire consisted of six sections of 20 questions, which were parallel to those in the version given to the students.

○ 3.3 Data Collection Procedures

Data collection began from October 2007 to March 2008. With reference to the relevant literature (Chang, 2007; Chia, 1999; Fang, 1987; Shen, 1996; Xu & Xiao, 2006; Zhuo, 1989) on needs analysis of medical students or professionals and in the light of expert opinions, the researcher designed a draft questionnaire to investigate the linguistic needs of medical students. The questionnaire had been distributed to 5 senior medical students for a pilot test. It was also sent to several medical and TESOL professionals for a pilot study for its face validity.

After the pilot questionnaire was revised, the final questionnaire was administered to 378 medical students (in their first, second, third, fourth and fifth year of study). Copies of the faculty questionnaire were given to 24 teachers who had taught medical students and were willing to complete the questionnaire (see Appendix). The students completed the questionnaire, which took 15 minutes, in one of their classes.

○ 3.4 Data Analysis Method

Statistical Package for Social Science (SPSS 10.07) was used to produce descriptive statistics for the totals, means, frequencies as well as the relative percentages. Chi-square and one-way ANOVA analysis were also conducted in order to determine the perceptions of English language needs of medical students and to compare the perceptions held by the three groups: faculty (F), lower-class group (LC) and upper-class group (UC).

4. Results and Discussion

In this paper, the results of the teacher and student surveys are integrated and presented according to the following six issues: (1) frequency of the use of English by medical students, (2) importance of using English in the medical field, (3) evaluations of medical students' proficiency in English, (4) needs analysis of the English course for the School of Medicine, (5) suggestions for improving the English curriculum for the School of Medicine, and (6) other assistance or requirements for medical students' linguistic needs.

○ 4.1 Frequency of the Use of English by Medical Students

In response to language instruction in the classroom (Q2), F (83.3%) said they presented the course content in Chinese but gave medical terms in English.

The results of Q3, which asked the faculty members for the percentages of the reading materials (such as textbooks or journal articles) in English for students, only F (12.5%) indicated that less than 50% of the reading materials they gave to students were written in English. Nevertheless, the majority of the UC (70.2%) indicated that less than 50% of the reading materials were in English and 64.6% of LC rated reading materials in English at 50% or below, indicating significant differences ($p < 0.001$) among the three groups, as shown in Table 2. A possible reason for this result is that students might use both the English and Chinese versions of the textbooks.

Table 2 Percentages of Reading Materials in English

	Participants			
	F&S&J (LC) n = 257	S&F (UC) n = 121	Faculty n = 24	Total n = 402
Less than 50%	166 (64.6)%	85 (70.2)%	3 (12.5)%	254 (63.2)%
51-70%	65 (25.3)	27 (22.3)	5 (20.8)	97 (24.1)
71-90%	18 (7.0)	6 (5.0)	2 (8.3)	26 (6.5)
91-100%	8 (3.1)	3 (2.5)	14 (58.3)	25 (6.2)

$\chi^2 = 123.401^a$

df = 6

$p = 0.000^{***}$

$***p < 0.001$

$*p < 0.05$, $**p < 0.01$, $***p < 0.001$

F&S&J (LC): F, freshmen; S, sophomores and J, juniors

S&F (UC): S, seniors and F, fifth graders

Specifically, in attempting to find out in what circumstances in class that students were using English (Q4), *write examination answers in English* (LC, 51.0%;

UC, 44.6%; F, 41.7%) and *hand in reports in English* (LC, 37.4%; UC, 58.7%; F, 29.2%) were chosen by all three groups of students (Table 3). Surprisingly, in comparison to other items, some participants (14.7%) thought that none of the circumstances require medical students to use English as a medium. The probable explanation is that teachers deliver lectures in Chinese but read the medical terms in English.

As a result, the faculty members either delivered their lectures or asked medical students to use Chinese as a medium to express their understanding of medical knowledge. Another possible reason is that the participants of the faculty members are the teachers who mostly teach the first and the second years of medical students. Those medical students have to learn the prerequisite courses for medicine which focus on the idea of the content courses in their first and second academic years until they have been offered the core medical curriculum in their third academic year.

Table 3 Circumstances of Using English in the Medical Course

Circumstances of medical courses	Participants										
	F&S&J (LC) n = 257			S&F (UC) n = 121			Faculty n = 24			Total n = 402	
	n	%	R	n	%	R	n	%	R	p	< .01
1. Write examination answers	131	51.0	1	54	44.6	2	10	41.7	1	.009	**
2. Hand in reports	96	37.4	2	71	58.7	1	7	29.2	3	.009	**
3. Discuss with teachers or classmates	53	20.6	3	18	14.9	4	4	16.7	6	.049	*
4. None	33	12.8	4	18	14.9	4	8	33.3	2		
5. Deliver presentation	31	12.1	5	22	18.2	3	2	8.3	7	.491	
6. Attend Web-English-Talk course (WET)	10	3.9	6	6	5.0	7	1	4.2	8	.097	
7. Attend hospital medical meeting	10	3.9	7	5	4.1	8	5	20.8	5	.097	
8. Write research papers	8	3.1	8	12	9.9	6	7	29.2	3	.022	*

R: rank

o **4.2 Importance of Using English in the Medical Field**

Questions Q5-6 on the combined questionnaire examined the role of English in students' current studies and future careers, presented in Table 4. Most students (LC, 93.8%; UC, 92.6%) and faculty (100%) believed English is *very important* or *important* in students' current medical studies (Q5). Yet, there were significant differences among the groups ($p < 0.01$) because the faculty felt English was more important for the students than the students did.

Generally speaking, English was very important for both medical students in their current studies and future careers. Nevertheless, in comparison to the faculty members, the findings illustrated that faculty members perceived English to be more important for the students than the students did. However, students were aware of the importance of using English in the medical field and these findings agree with Chia (1999).

Table 4 Importance of English for Current Medical Studies and Future Medical Careers

	Participants											
	F&S&J (LC) n = 257			S&F (UC) n = 121			Faculty n = 24			Total n = 402		
	n	M	SD	n	M	SD	n	M	SD	F	df	p
Current studies	257	3.40	.71	121	3.27	.67	24	3.83	.38	6.858	401	.001
Future careers	257	3.43	.68	121	3.28	.69	24	3.42	.58	2.066	401	.128

With regard to Qs7-8, the respondents were asked to rate the importance of using English in terms of success in academic studies or reinforcement on discussion skills in class or at medical meetings, as shown in Table 5.

Table 5 Importance of Using English for Medical Studies

	Participants											
	F&S&J (LC)			S&F (UC)			Faculty			Total		
	n	M	SD	n	M	SD	n	M	SD	F	df	p
To succeed in academic studies	257	3.07	.67	121	3.04	.68	24	3.13	.74	.176	401	.839
To foster discussion skills	257	3.05	.72	121	3.01	.76	21	3.24	.62	.892	398	.441

When participants were asked about the perceptions of the importance of using English for students' academic success (Q7), 85.8% of the respondents said English

was *very important* or *important* (LC, 88.0%; UC, 82.6%; F, 79.1%) with no significant differences among the three groups ($p > 0.05$).

The results for the importance of using English is to foster discussion skills in class or at medical meetings (Q8). 82.7% of the participants said English was *very important* or *important* (LC, 84.0%; UC, 78.5%; F, 90.4%) with no significant differences among the three groups ($p > 0.05$).

In response to the importance of English skills for medical students (Q9), students and faculty were asked to rank the four skills. The majority of every group (UC, LC, and F) ranked reading as the most important, followed by listening, speaking and writing, respectively.

○ 4.3 Evaluations of Medical Students' Proficiency in English

Q10 asked the respondents to evaluate the English language problems that students currently face in their academic studies, *poor speaking skill* (LC, 73.2%; UC, 62.0%; F, 50.0%), *limited vocabulary* (LC, 66.9%; UC, 52.1%; F, 37.5%), *poor writing* (LC, 47.9%; UC, 55.4%; F, 58.3%) and *poor listening comprehension* (LC, 52.5%; UC, 46.3%; F, 45.8%) were rated among the most difficult problems. *Poor reading comprehension* was rated among the easiest problem (LC, 17.9%; UC, 19.8%; F, 33.3%) which is not in accord with the findings of Guo (1987) and Chia (1999).

In terms of evaluating the importance of English skills for success in medical studies (Q11), *reading to understand English textbooks and medical journal articles* was perceived as an important skill by the majority of the students (LC, 75.9%; UC, 81.8%) and of F (87.0%), which matches the finding of Chia (1999). Interestingly, the second most important for the students was *training to have listening note-taking skills* (LC, 53.3%; UC, 43.8%), while F (56.5%) rated *writing research papers* as the next important. The implication is that medical teachers need the English proficiency to write medical research papers for promotion. The least important skill as perceived by all three groups was *writing examination answers* (LC, 24.1%; UC, 12.4%; F, 21.7%)

○ 4.4 Needs Analysis of the English Course for the School of Medicine

With regard to reading (Q12), LC (63.4%) felt that *reading English newspapers and magazines* was the most important, while UC (41.1%) and F (40.9%) thought that

reading English medical journals should be the focus. It should be noticed that this focus chosen by both UC (41.1%) and F (40.9%) was for research-oriented purposes. Moreover, F (36.4%) believed that *reading English textbooks and lecture handouts* were the aspects that should be emphasized, with significant differences among three groups ($p < 0.001$) (Table 6).

Table 6 Emphasis of Reading Aspect in the English Course

	Participants			
	F&S&J (LC) n = 238	S&F (UC) n = 112	Faculty n = 22	Total n = 372
Read English newspapers and magazines	151 (63.4)%	37 (33.0)%	5 (22.7)%	193 (51.9)%
Read English textbooks and lecture handouts	37 (15.5)	27 (24.1)	8 (36.4)	72 (19.4)
Read English medical journals	48 (20.2)	46 (41.1)	9 (40.9)	103 (27.7)
Other	2 (0.8)	2 (1.8)		4 (1.1)

$$\chi^2 = 38.164^a$$

$$df = 6$$

$$p = 0.000^{***}$$

$$***p < 0.001$$

In response to listening (Q13), LC (37.8%) felt that *understanding daily conversations* was the most important aspect, while UC (46.3%) and F (50.0%) thought that *understanding the medical conversations* should be the focus. It is necessary to point out that both UC and F groups paid greater attention to the medical field. Still, 31.8% of the F and 30.9% of the LC believed that *understanding radio and TV programs* was the aspect that should be emphasized more, with significant differences among three groups ($p < 0.001$) (Table 7).

Table 7 Emphasis of Listening Aspect in the English Course

	Participants			
	F&S&J (LC) n = 217	S&F (UC) n = 108	Faculty n = 22	Total n = 347
Understanding radio and TV programs	67 (30.9)%	23 (21.3)%	7 (31.8)%	97 (28.0)%
Understanding daily conversations	82 (37.8)	22 (20.4)	2 (9.1)	106 (30.5)
Understanding the medical conversations	53 (24.4)	50 (46.3)	11 (50.0)	114 (32.9)
Having listening note-taking skills	5 (2.3)	3 (2.8)	1 (4.5)	9 (2.6)
Following course lectures	10 (4.6)	10 (9.3)	1 (4.5)	21 (6.1)

$$\chi^2 = 28.870^a$$

df = 8
 $p = 0.000***$
 $***p < 0.001$

Regarding speaking (Q14), LC (76.8%), UC (62.3%) and F (56.5%) felt that *carrying on daily conversations* was the most important aspect, while F (43.5%) thought that *presenting classroom oral presentations* should be the focus, indicating significant differences ($p < 0.01$) among the three groups presented in Table 8.

Table 8 Emphasis of Speaking Aspect in the English Course

	Participants			
	F&S&J (LC) n = 241	S&F (UC) n = 114	Faculty n = 23	Total n = 378
Carrying on daily conversations	185 (76.8)%	71 (62.3)%	13 (56.5)%	269 (71.2)%
Presenting classroom oral presentations	41 (17.0)	31 (27.2)	10 (43.5)	82 (21.7)
Delivering a speech	12 (5.0)	7 (6.1)		19 (5.0)
Other	3 (1.2)	5 (4.4)		8 (2.1)

$\chi^2 = 17.639^a$
df = 6
 $p = 0.007**$
 $**p < 0.01$

In terms of writing (Q15), LC (58.8%), UC (41.4%) and F (34.8%) felt that *writing for practical purpose* (e.g. memos, e-mail messages, letters) was the most important aspect, while 47.7% of the UC and 52.2% of F thought that *writing medical reports* should be the focus, with significant differences among the three groups ($p < 0.01$) (Table 9). Evidently, both UC (47.7%) and F (52.2%) selected the writing aspect for research-oriented purposes.

Table 9 Emphasis of Writing Aspect in the English Course

	Participants			
	F&S&J (LC) n = 228	S&F (UC) n = 111	Faculty n = 23	Total n = 362
Writing for practical purpose	134 (58.8)%	46 (41.4)%	8 (34.8)%	188 (51.9)%
Writing course assignments	18 (7.9)	3 (2.7)	1 (4.3)	22 (6.1)
Writing medical reports	59 (25.9)	53 (47.7)	12 (52.2)	124 (34.3)
Writing research papers	12 (5.3)	8 (7.2)	2 (8.7)	22 (6.1)
Other	5 (2.2)	1 (0.9)		6 (1.7)

$\chi^2 = 23.768^a$
df = 8
 $p = 0.003**$
 $**p < 0.01$

All three groups of respondents (Q16) believed that the materials in the English course should be relevant to the medical field (LC, 73.7%; UC, 67.5%; F, 65.2%) and the responses among the three groups were not significantly different ($p>0.05$).

When participants were asked to choose the focus of the aspect of language skill of English materials related to the medical field in the English course (Q17), 51.7% of the respondents (LC, 54.8%; UC, 47.1%; F, 40.0%) reported that the materials in *the English course should be relevant to medical reading*, which echoes the finding of Chia (1999). Nevertheless, 38.9% of them (LC, 38.7%; UC, 35.6%; F, 60.0%) indicated medical conversation (listening/ speaking).

With regard to the curriculum (Q18), the best design perceived by the majority of students and faculty was *general English in the freshman year*, followed by *medical English in the second and third years*. The second desirable design was *general English in the first and second years, medical English in the third year*.

In response to the aspect of linguistic skill of the curriculum design (Q19), the best curriculum design perceived by the majority of the students and faculty was *reading class in the freshman year, listening class in the sophomore year, and conversation class in the junior year* (see Table 10). The implication is that medical students wanted the input of English language learning (reading and listening) before the output of the English language learning (speaking and writing).

Table 10 Perceived Best English Curricula

	Participants			
	F&S&J (LC) n = 251	S&F (UC) n = 120	Faculty n = 23	Total n = 394
1 st year: reading class, 2 nd year: conversation class, 3 rd year: listening class	35 (13.9)%	13 (10.8)%	3 (13.0)%	51 (12.9)%
1 st : reading class, 2 nd : listening class, 3 rd : conversation class	93 (37.1)	34 (28.3)	8 (34.8)	135 (34.3)
1 st : listening class, 2 nd : conversation class, 3 rd : reading class	52 (20.7)	25 (20.8)	6 (26.1)	83 (21.1)
1 st : listening class, 2 nd : reading class, 3 rd : conversation class	18 (4.6)	7 (1.8)		25 (6.3)
1 st : conversation class, 2 nd : reading class, 3 rd : listening class	9 (3.6)	8 (6.7)		17 (4.3)
1 st : conversation class, 2 nd : listening class,	20 (8.0)	18 (15.0)	2 (8.7)	40 (10.2)

3 rd : reading class				
other	24 (9.6)	15 (12.5)	4 (17.4)	43 (10.19)
$\chi^2 = 12.908^a$				
df = 12				
$p = 0.376$				
$p > 0.05$				

○ **4.5 Suggestions for Improving the English Curriculum for the School of Medicine**

The results of Q20 suggested that both LC and UC like learning *individually* (LC, 40.8%; UC, 43.7%) and learning *in small groups* (LC, 59.2%; UC, 51.3%) in the English course than learning *with the whole class* (LC, 12.4%; UC, 7.6%), probably because the size of the class is usually too big (65 students), and so the students wanted more attention from teachers. Additionally, as to the second suggestion (Q21), both LC and UC like learning *by listening* (57.2%), *by reading* (52.0%) and *by getting information for themselves* (36.6%) in the English course, rather than *by memory* (19.2%) and *by copying from the board* (15.4%). The majority (86.2%) of the respondents claimed that they like learning (Q22) from *television/ video/ DVD/ films, CDs/ cassettes* (40.8%), *radio* (37.0%) and *the internet* (33.8%) in the English course instead of learning from *pictures/ posters* (11.4%) and *the blackboard/ whiteboard* (7.6%).

Q23 asked about the English course. 63.3% of the students stated that they found the activities of *singing songs* and *talking with and listening to other students* (42.4%) helped their English learning. Accordingly, several pedagogical implications can be drawn from these findings which support the basic characteristics of Communicative Language Teaching proposed by Nunan (1991): (1) an emphasis on learning to communicate through interaction in the target language, (2) the introduction of authentic texts into the learning situation, (3) the provision of opportunities for learners to focus, not only on the language but also on the learning process itself, and (4) an enhancement of the learner's own personal experiences as important contributing elements to classroom teaching (p. 279). With respect to Q24, 66.1% of the students maintained that they got a sense of satisfaction from *feeling more confident in situations that they found difficult before* in the English course. Nonetheless, 44.7% of the students believed that they got a sense of satisfaction by *passing a certain English proficiency exam (such as TOEFL, TOEIC, IELTS)*, and this finding supports that relating to other requirements for medical students' linguistic

needs (such as having a score higher than 80 on the TOEFL iBT test, 750 on the TOEIC test or taking extra English courses) that could help medical students improve their proficiency in English.

○ **4.6 Other Assistance or Requirements for Medical Students’ Linguistic Needs**

As shown in Table 11, though the mean score is only between 2.00 and 3.00, the results are generally positive. Most of the participants regarded that the policy of lecturing an English course in English should have a positive effect on their English learning with no significant difference among the three groups ($p > 0.05$). Further analysis reveals that 57.7% LC, 64.1% UC and 77.2% F indicated either “strongly agree” or “agree” that the policy would help medical students to improve their proficiency in English.

Table 11 Other Assistance for Medical Students’ Linguistic Needs

	Participants											
	F&S&J (LC)			S&F (UC)			Faculty			Total		
	n	M	SD	n	M	SD	n	M	SD	F	df	p
Lecturing English course in English	246	2.67	.80	117	2.71	.74	22	2.82	.80	.406	384	.667

In response to Q26, the results in Table 12 indicate that though the mean score is only between 2.00 and 3.50, the results are generally positive. Most of the participants considered that the policy of English language requirement should also have a positive effect on their proficiency in English. Yet, there were significant differences among the three groups ($p < 0.01$). Further analysis suggests that LC (64.1%), UC (56.5%) and F (95.7%) chose “strongly agree” or “agree” that the policy should improve medical students’ proficiency in English. As a result, in comparison to the faculty members, the finding shows that faculty members perceived English to be more important for the students than the students did. Nevertheless, students were aware of the importance of English and this finding is in line with the study done by Chia (1999).

Table 12 Other Requirements for Medical Students' Linguistic Needs

	Participants											
	F&S&J (LC)			S&F (UC)			Faculty			Total		
	n	M	SD	n	M	SD	n	M	SD	F	df	p
Other requirements for medical students' linguistic needs	242	2.63	.77	115	2.49	.81	23	3.04	.37	5.247	379	.006

5. Limitations & Recommendations

First, the generalization of the results to other populations with different academic years may be limited. Since the participants of this study involved only the first five of seven academic year students, perhaps future research could also analyze the linguistic needs of interns to benefit both medical students' specific linguistic needs and to facilitate their medical English language learning.

Second, further research could target to fill the gap between the perceptions of the faculty members and the students for writing research papers and for the importance of English. An interview could be the next step for further study.

Third, faculty members who teach EMP would have to meet with the Faculty of Medicine regularly, for example once a month or so to match and consolidate the learning experiences for students, by, for instance, teaching similar subjects at the same time with their unique disciplinary perspective (Hull, 2006).

Lastly, the faculty of EMP should identify and examine whether content and context would mirror real world experiences in which the graduate will soon become involved (Hull, 2006).

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Appendix

Questionnaire of Linguistic Needs for Medical Professionals (Combined Version)

This survey is completely confidential and anonymous. We are not asking for your identity and the information gathered will not be used for any purposes other than compiling data to better instruct medical students. Please read the instructions in every section with care and complete the following questionnaire to the best of your ability. Thank you very much for your cooperation and important contribution for the evaluation!

Part I. Demographics

1. *Students Only*: ____ freshman ____ sophomore ____ junior ____ senior ____ fifth grader

Part II. Frequency of the Use of English by Medical Students

2. *Faculty Only*: How do you present the course content in your oral lectures?

____ in English ____ in Chinese, but medical terms in English ____ in Chinese ____ other

3. What percentage of the reading materials (such as textbooks or journal articles) are English for your/ your students' study?

____ less than 50% ____ 51-70% ____ 71-90% ____ 91-100%

4. To what circumstances at your study are you/ your students using English?

(You may check whatever is appropriate)

____ hand in reports in English

- deliver presentation in English
- write examination answers in English
- write research papers in English
- discuss with teachers or classmates in English
- attend hospital English medical meeting/conference
- attend Web-English-Talk course (WET)
- none

Part III. Importance of Using English in the Medical Field

Indicate your attitude to rate the importance of each of the following items.

(Use the following scale: 1 = unimportant, 2 = somewhat important, 3 = important, 4 = very important)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 5. How important do you think English is to your/ your students' current medical studies? | 1 2 3 4 |
| 6. How important do you think English is to your/your students' future careers? | 1 2 3 4 |
| 7. How important would you think the purpose of using English is to succeed in academic studies? | 1 2 3 4 |
| 8. How important would you think the purpose of using English is to foster discussion skills in class or at medical meetings? | 1 2 3 4 |
| 9. Which of the following English skills do you think are more important than the others for your/ your students' medical studies? (Rank them this way: 1 = least important; 4 = most important. Rank all.) | |
| <input type="checkbox"/> listening <input type="checkbox"/> speaking <input type="checkbox"/> reading <input type="checkbox"/> writing | |

Part IV. Evaluations of Medical Students' Proficiency in English

10. What English problems are you/ your students currently facing in medical studies?

(You may check whatever is appropriate)

- limited vocabulary poor grammar
- slow reading speed poor reading comprehension
- poor writing poor listening comprehension
- poor speaking skill no idea other

11. Which of the following English skills are important for your/ your students' success in medical studies? (You may check whatever is appropriate.)

- reading to understand English textbooks and medical journal articles
- presenting oral reports understanding class lectures
- carrying on conversations writing examination answers
- writing research papers training to have listening note-taking skills other

Part V. Needs Analysis of the English Course for the School of Medicine

(Select one to indicate your attitude.)

12. What would you think the emphasis of the reading aspect in the English course should be?
- to read English newspapers and magazines
 - to read English textbooks and lecture handouts
 - to read English medical journals
 - other _____ (Please specify and select.)
13. What would you think the emphasis of the listening aspect in the English course should be?
- to understand radio and TV programs
 - to understand daily conversations
 - to understand the medical conversations
 - to have listening note-taking skills
 - to follow course lectures
14. What would you think the emphasis of the speaking aspect in the English course should be?
- to carry on daily conversations
 - to present classroom oral presentations
 - to deliver a speech
 - other _____ (Please specify and select.)
15. What would you think the emphasis of the writing aspect in the English course should be?
- to write for practical purpose (e.g. memos, e-mail messages, letters)
 - to write course assignments
 - to write medical reports
 - to write research papers
 - other _____ (Please specify and select.)
16. Should the materials in the English course be relevant to the medical field?
- Yes No (If no, skip to Question 26)
17. What aspect of language skill of English materials related to the medical field in the English course should be emphasized more?
- medical conversation (listening/ speaking)
 - medical reading
 - medical writing
18. Which of the following English curricula do you perceive is the best one for you/ your students?
(The term "medical English" used here means that the teaching materials of the English course are relevant to the medical field.)
- General English in the first year, medical English in the second and third years
 - General English in the first and second years, medical English in the third year
 - General English from the first through the third year, no need for medical English
 - Medical English from the first through the third year, no need for general English
 - Both medical and general English from the first through the third year
 - other _____ (Please specify and select.)

19. Which of the following English curricula do you perceive is the best one for you/ your students?

- freshman*: reading class, *sophomore*: conversation class, *junior*: listening class
 freshman: reading class, *sophomore*: listening class, *junior*: conversation class
 freshman: conversation class, *sophomore*: reading class, *junior*: listening class
 freshman: conversation class, *sophomore*: listening class, *junior*: reading class
 freshman: listening class, *sophomore*: conversation class, *junior*: reading class
 freshman: listening class, *sophomore*: reading class, *junior*: conversation class
 other _____ (Please specify and select.)

Part VI. Suggestions for Improving the English Curriculum for the School of Medicine

(You may check whatever is appropriate.)

20. *Students Only*: In the English course, I like learning

- individually in pairs in small groups with the whole class other _____

21. *Students Only*: In the English course, I like learning

- by listening by listening and taking notes by repeating what I hear
 by reading by reading and making notes other _____
 by memory by copying from the board
 by problem solving by getting information for myself

22. *Students Only*: In the English course, I like learning from

- television/video/DVD/films radio the internet tapes/CDs/cassettes
 written material the blackboard/whiteboard pictures/posters
 other _____

23. *Students Only*: In the English course, I find these activities useful.

- role play language games debate songs other _____
 talking with and listening to other students memorizing conversations/dialogues

24. *Students Only*: In the English course, I get a sense of satisfaction from

- having my work graded
 being told that I have made progress by teachers
 feeling more confident in situations that I found difficult before
 passing a certain English proficiency exam (such as, TOEFL, TOEIC, IELTS ...)
 other _____

Part VII. Other Assistance or Requirements for Medical Students' Linguistic Needs (Open-ended Questions)

25. If this English course being delivered in English could help medical students improve their proficiency in English.

- strongly disagree disagree agree strongly agree

Why? _____

26. If other requirements for medical students' linguistic needs (such as, having a score higher than 80 on the TOEFL iBT test, 750 on the TOEIC test or taking extra English courses) could help them improve their proficiency in English.

____ strongly disagree ____ disagree ____ agree ____ strongly agree

Why? _____



Integrating Product, Process and Team Teaching in Writing Instruction

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Abstract

The genre approach to writing has been criticized by some hard-line advocates of the process movement as it focuses on the 'products' rather than the 'processes' of writing. Instead, they emphasize practices such as planning, self-reflection and

revision of drafts. In response to these criticisms, many practitioners argue that 'form' cannot be dissociated from content, and they propose a more sophisticated notion of 'form' as one which comprises macrostructures and moves of texts that reflect the conventions of a discourse community. The objective of this paper is to demonstrate how the product and process approaches can be combined and further enhanced by incorporating team teaching in university programmes that focus on writing in subject-specific academic genres. This three-dimensional approach of product, process and team teaching - which involves the cooperation of the subject specialists, language experts and the students - will be explored in this paper. This unique approach will be demonstrated with specific reference to the technical communication course in the Singapore Stanford Partnership (SSP) Programme joint collaboration between Nanyang Technological University in Singapore and Stanford University.

Key Words: genre approach, process approach, team teaching, technical communication, academic genres, English for Specific Purposes

1. Introduction

1.1 Background

Most universities where the medium of instruction is English have a large pool of international students, and as such these universities have English language programmes to help both undergraduate and postgraduate students to reach their full academic potential. The two types of courses offered to these students are common-core English for Academic Purposes (EAP) courses that are designed to prepare students to cope with their academic studies across the curriculum, and English for Specific Purposes (ESP) courses designed to help them with the writing of specific genres in their subject disciplines. At the postgraduate level, ESP courses are usually integrated with students' content subjects, and therefore there is a need to teach subject-specific genres such as abstracts, reports and theses. This paper discusses ESP academic writing instruction in the context of the Singapore Stanford Partnership (SSP) Programme.

1.2 The SSP Programme

The SSP programme is a joint collaboration project between Nanyang Technological University and Stanford University, offering postgraduate degrees in Environmental Science and Engineering. Although the students enrolled on this course have relatively high levels of specialization in the field of science and technology, they have little experience in academic writing. The writing module is, therefore, designed to familiarize these postgraduate students with research-based writing such as extended abstracts, term papers and research reports that they are required to submit as part of their course work.

1.3 The Teaching Approach

Given that the academic writing needs of the SSP students are so specific, it was felt that the genre approach would be the most appropriate for them. The decision was made in spite of the criticism by some hard-line advocates of the process movement that the genre approach focuses on the ‘products’ or ‘forms’ of texts rather than the ‘processes’ of writing (Flower, 1989; Mlynarczyk, 1991). The controversy between product and process is far from resolved but genre analysts have proposed a more sophisticated notion of genre that does not dissociate form from content (Coe, 1987; Swales, 1990). Some practitioners have gone a step further to suggest that both approaches can in fact be combined by emphasizing typical conventions associated with particular genres as well as practices such as planning, self-reflection and revision of drafts (Jacoby, Leech & Holten, 1995).

Another point of criticism of the genre approach is that although form and content are not dissociated in the new approach to teaching genres, language experts are basically hampered by their limited understanding of complex technical and scientific content. In addition, ESP teachers tend to operate within the confines of ‘textual space’ with its focus on linguistic aspects of discourse rather than venturing into ‘tactical space’ and ‘social space’ which are concerned with a more socio-pragmatic view of discourse and socio-cultural view of discourse (Candlin, 2002, p.43). According to Bhatia (2002, p. 43) the over-emphasis on text “is likely to deprive the language teacher and the learner of most useful contextual information”. Therefore, collaboration between the subject specialist and the language expert has been emphasized to bridge the gap between what is linguistically and professionally acceptable within specialist disciplines.

1.4 A Three Dimensional Approach

This paper demonstrates how the product and process approaches can be combined and further enhanced by team teaching in university programmes that focus on writing in the subject specific academic genres. This three dimensional approach of product, process and team teaching which involves the cooperation of the subject specialists, language experts and the students will be explored in this paper. This unique approach will be described with specific reference to writing instruction in the SSP Programme.

2. Applying the Genre Approach

2.1 The Concept of Genre

The traditional definition of genres is that they are literary texts which display textual regularities in form and content; they are fixed and immutable and can be neatly classified into categories and subcategories (Freedman & Medway, 1994). These features of genre have been challenged in current reconceptualizations of genre. Specifically genres are understood as being complex written and spoken responses to the demands of societies, comprising macrostructure and moves that reflect certain typical conventions, contents and expectations within initiated readers of a discourse community (Swales, 1981, 1990). In addition, genres are no longer perceived as moulds into which meaning is poured, but as organizational structures with meaningful form-function correlations that serve the communicative purposes of a discourse community. In fact, it is now recognized that texts within a genre are not static but exhibit many variations at the rhetorical, semantic and linguistic levels, providing writers with a wide variety of choices.

In recent years, the concept of genre has undergone a change as represented in a shift from definitive definitions that focus on merely one characteristic such as the shared communicative purpose of genres (Swales, 1990, p. 56), the action a genre is used to accomplish (Miller, 1984, p. 151), or the manner in which things get accomplished (Martin, 1985, p. 250). According to Swales (2004), current attempts to define genres are in terms of metaphors which throw light on different aspects of genres to varying degrees of understanding. Devitt (1997), for instance, makes a comparison between 'linguistic etiquette' and 'genre etiquette', both of which are subject to change over time depending upon what is socially and rhetorically appropriate. Another example is Bazerman's (1997, p.19) definition of genres as

“frames” for social action, according to which genres are perceived to be a starting place for speakers/writers to sort out their ideas rather than rigid social actions.

2.2 Adopting the Genre Approach

Arguably, there are many advantages of using a genre-based approach in teaching writing to graduate students such as those in the SSP Programme, especially one that emphasizes flexibility and variation at different levels of realization. This is because the needs of graduate students are very specific. As they have already chosen their specializations, it is possible to design courses for them to develop their research and writing skills in the context of their disciplines. However, there are a number of constraints that need to be taken into consideration. Among these constraints are time and lack of motivation. The entire course consists of eleven 2-hour classes and there is a generally low level of motivation among students. Developing writing skills is low in the priority scale of the SSP students because of the heavy demands of the technical courses. To overcome these constraints to some degree, language training is integrated with technical training in the programme. Most of the writing assignments, set by the Nanyang Technological University (NTU) and Stanford professors, are intermediate writing tasks meant to prepare students for subject-specific research genres. Adopting a genre-based approach also ensures that the writing instruction leads to ‘deliverables’ specified by the SSP Programme. These ‘deliverables’ are the extended abstract, term paper, research proposal and research report which students are required to submit during the course. The term paper assignment given to the SSP students is reproduced below:

Comment [H1]: Is this a lot/ not enough?

Example 1: Term Paper Assignment

Course: CEE 265C Water Resources Management

Select a country or a region within a country of your choice and write a paper on the water management problems over the next 30 years. In discussing these points try to understand and describe what is being done now and what could be done to ensure that future demand can be met.

To fulfill the requirements of the term paper (see extracts from assignment handout given below), students need to understand and apply conventions of the genre.

Example 2: Requirements of Term Paper

"...the title, a short statement of the topic's importance; a declaration of your paper's scope; a statement of your paper's position; list of key references; show the most important graphics."

"Required sections include Abstract, Introduction, Background/Literature Review, Methods, Results and Discussion".

An effective way to familiarize students with target genres is to start off with a rhetorical analysis of professional and peer text models. As students are exposed to more text samples, they begin to realize what conventions are typical of a genre and to note how texts can vary in terms of organization, textual patterns, semantic realizations and linguistic choices. In this context, Jacoby, Leech and Holten (1995) stress the importance of selecting published samples of target genres that reflect typical realizations of the genre as well as those that deviate from typical models. As for student samples, the advice given is to select for class discussion those samples that adopt genre conventions effectively. The samples should also include those that omit important elements of the genre or only partially fulfill the genre expectations. Therefore, in teaching writing of the different genres in the SSP Programme, students are first given a sample of a published paper to analyze and discuss. Once they understand the conventions of a research paper in their discipline, they proceed to analyze a student sample in which genre conventions are not fully complied with. After the analysis, the students re-write the sample text to improve it.

Though a genre-based approach to writing instruction has many pedagogical benefits, one of the most common criticisms is its focus on 'products' or 'forms' of text rather than the 'processes' of writing (Flower, 1989; Mlynarczyk, 1991). To address this concern, the genre approach used in the SSP Programme was reconceptualized by combining genre (product) with process.

3. Adopting the Process Approach

3.1 Writing as a Changeable Process

Although in the past, focus in most writing courses was on the finished product, the situation has changed as there has been a shift to writing processes. In the process

approach “the emphasis is on the task environment of the assignment, the writer’s long-term memory comprising knowledge of content, genre and audience, and the writing process” (Hayes, 1989). Composition researchers (Hayes & Flower, 1980) place a lot of emphasis on the different stages of composing that writers weave through, such as planning, writing and revising, along with other sub-processes of organizing and editing. They believe that these processes are not sequential but recursive and that mature writers find the sub-processes of planning and revising especially useful when composing texts. While composition teachers are well aware that writing is a strategic process. Process writing practices have so far been neglected in ESL classrooms, and in fact, some ESL teachers have started questioning the centrality of process in writing classes. In reaction to this situation, Dudley-Evans (1995) argues that teaching writing as a changeable process, without overemphasizing the process approach, is a good strategy in ESL composition classes. This is because students typically focus on developing their expertise in their scientific disciplines at the expense of language skills in their subject courses. Yet others, like Beaufort (1999), believe that writing effectively involves subject matter knowledge, rhetorical action, writing process knowledge and genre knowledge, which constitute discourse community knowledge that is necessary for success in writing.

3.2 Process Writing Practices

To inculcate process writing practices, students in the SSP programme were introduced to the concepts of planning, composing and revising. Tutorial activities encouraged students to brainstorm ideas, source for relevant readings, and create outlines in the planning phase. During the composing phase, students composed a series of drafts to be reviewed by both peers and instructors. In the last phase, sufficient time was given to students to revise and edit their drafts based on the feedback. In addition to peer-editing and instructor feedback, students were trained to reflect on their own writing through guided self-reflection activities. One such example is the sample self-reflection checklist for Abstracts:

Example 3: Self-Reflection Checklist for Abstract

Examine the content of your abstract and see whether

- it is well organized and includes all necessary information
- it has summarized main results (including key statistical information) of the study
- it has omitted unnecessary details of the study such as definitions and other background information which are more appropriate for the main report
- it adds no new information other than what is contained in the report
- it omits citations and references
- it is neither too brief nor too long

Examine the language used in your abstract and see whether

- it uses language that is concise and concrete
- it has good transitions from point to point
- it has avoided the use of trade names, acronyms, abbreviations, or symbols unless they are absolutely necessary

Therefore, the writing instruction in the SSP programme, while focusing on genre, also incorporated process. While the typical conventions associated with particular genres were emphasized, practices such as planning, self-reflection and revision of drafts which are typical of a process approach were also introduced into the writing classes.

In developing themselves as writers, it is essential for students to look at writing holistically and to manage the multi-faceted process of writing. This knowledge can only come through the process approach to writing, as it enables them to explore and diagnose their strengths and weaknesses as they go through the recursive writing phases of planning, composing and revising. It is only through this experience of self reflection on their own writing that they can maintain a broader perspective on writing rather than a narrow focus on the written product. To guide them along this process, it is essential to provide these developing L2 writers with criteria checklists to evaluate their own writing and teacher-guided revision of sample drafts.

Comment [H2]: I have a question regarding tense – is the SSP course no longer offered? Or has it changed? If not, perhaps consider using present tense to refer to what is done and what happens in the course.

4. Incorporating Team Teaching

4.1 Collaborative Teaching

Some educational institutions have gradually shifted from individual to team teaching to meet the changing needs of students and to improve the quality of teaching and learning. This is perhaps due to the realization that “the ‘whole’ of the participants, *working together*, will make a greater contribution than the ‘sum’ of the participants working alone” (Davis, 1966, p.2). Collaborative teaching is definitely gaining popularity in academic writing programmes which prepare students for discipline specific writing (Dudley-Evans, 1995; Frodesen, 1995; Chenock, 2003, 2004; Collins, 2004). In the context of the SSP Programme, collaborative teaching was particularly advantageous as it capitalized on the strengths and expertise of two teachers, a language instructor and a subject specialist.

Whether applying the genre approach or adopting the process approach, it is not uncommon for ESL teachers to feel a sense of inadequacy when dealing with subject-specific genres composed by graduate students in the area of science and technology (Frodesen, 1995). There seems to be a lack of shared interest among specialists and language experts in each other’s practices and very little collaboration in the form of research or team taught courses (Candlin, 2002, p.53). This is not only due to unfamiliarity with the topics and technical terminology in the writings of their graduate students but also with the practices of the specialist community. A solution to this problem faced by language teachers is to team up with subject teachers in writing classes that focus on teaching specific academic or research genres such as technical reports, grant proposals, summaries of research, conference papers, critical reviews of published research, or literature reviews of current developments in their fields. As these writing tasks require knowledge of different genre-based conventions, as well as familiarity with discipline-specific writing conventions, team teaching may be the best approach. The advantages of team teaching, according to Dudley-Evans (1995), are many as all three participants - “the students, the subject teacher, and the language teacher – gain particular insights from the sessions” (p.304).

4.2 Advantages of Team Teaching

At the micro level, students learn from the team teaching experience how to apply specific genre conventions to their writing tasks in terms of overall organization, content and language. Moreover, they are better able to understand and meet the expectations that subject teachers have of them. Subject teachers also benefit from

this exercise as they are able to understand what problems students have in interpreting their questions and instructions when attempting subject-related assignments. For instance, the SSP students are asked to “take a critical stance” when writing review and term papers. Language teachers who tend to be from a humanities or social science background may interpret this exhortation differently. It was necessary, therefore, to ask the subject specialist to clarify what the phrase entailed from an engineering perspective and his explanation incorporated the parameters below:

Example 4: Explanation Given by Subject Specialist

“take a critical stance”

1. The project can/cannot meet the stated goals.
2. The product will/will not perform as expected.
3. The data is of high/low/questionable quality.
4. The tool is a good/bad match for the application.
5. The regulation can/cannot be enforced.
6. The hypothesis was/was not adequately tested.
7. The data was correctly/poorly interpreted.

The advantage for the language teacher is that s/he has many opportunities to observe classroom interactions amongst subject teachers and students in order to understand what expectations they have of their students and what problems students encounter in fulfilling these expectations. Through discussions with subject teachers and participation in classroom activities, language teachers gain “understanding of the culture of the discipline that cannot be gained through purely ‘desktop’ research” (Dudley-Evans, 1995). In addition, the language teacher is able to consult the subject teacher when evaluating field specific work by not judging it purely in terms of organization and grammar but also in terms of technical content.

At the macro level, such partnerships enable ESP practitioners to be sensitive to the changing and evolving socio-cognitive needs of discourse communities which ultimately have an impact on existing genres, causing them to change and evolve over time. In language teaching, the focus tends to be on idealized and pure generic forms at the expense of creative variations of genres in the form of generic hybridization that

could take the form of mixing, embedding, and bending of genres (Candlin, 2002). This focus has a negative effect on instructors and learners as they begin to legitimize standardized and conventionalized generic forms, inhibiting them from experimenting with genres. As long as language instructors and learners maintain this attitude, they continue to be outsiders rather than active members of a discourse community. In order to be part of the research space of discourse communities, it is necessary to move from peripheral participation to full immersion into the discourse culture to access necessary tacit knowledge of disciplinary practices.

5. Conclusion

We believe that the integrated approach described in this paper can be easily translated into a writing course tailored to the needs of any discipline. To successfully adapt this approach to another discipline, two key conditions must be met. The first is that writing tasks must be connected to the subject matter courses. The second is that a dialogic environment must be created in which language specialists, subject specialists and students can negotiate needs and priorities as well as meaning. Through this three-way interaction, students' metacognitive skills with regard to genre-stability and genre-change can be developed. In this way, students can gradually be immersed into the research culture and practices of their discipline rather than possessing only rudimentary knowledge about their specialist disciplines.

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**A Genre-based Study of Medical Research Article Introductions:
A Contrastive Analysis Between Chinese and English**

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Abstract

This study examines the genre of research article introductions across languages, with the aim to explore different rhetorical structures and linguistic features in Chinese and English medical research article introductions (RAIs). The corpus for this study consists of forty research article introductions selected from Chinese and English academic medical journals. Swales' CARS model is employed for the analysis, which is followed by a discussion of the results from macro-structural and micro-linguistic perspectives, where significant differences between the corpora are identified. Some tentative explanations based on social and cultural perspectives are given for the different rhetorical structures in the two corpora. This study addresses variations in academic discourse between English and Chinese and reveals that academic writing exhibits culture-specific characteristics.

Key Words: genre; research article introduction; contrastive rhetoric; CARS model

1. Introduction

With the need to transmit knowledge across languages and cultures, there is now a growing body of literature in academic writing that focuses on describing and comparing the rhetorical patterns of academic writing in different languages and cultures (Connor & Mauranen, 1999; Duszak, 1994, 1997; Swales, 1990). With English becoming the international language of research and scholarship, non-native English speaking writers must conform to conventional styles of English rhetoric if they are to be accepted and published (Duszak, 1994). Yet academic English writing remains problematic for these researchers, for whom English is a second language (Silva, 1993). Chinese writers also face this problem, which creates a demand for Chinese students and scholars to undergo academic writing training.

Although academic writing conforms to certain generic structures, different writers organize texts differently. The shaping of a written text by a writer reflects deeply embedded cultural and rhetorical assumptions about what materials may be presented, how these materials are to be organized, how they may be represented in an acceptable way—not necessarily in a way that is objectively most transparent (Grabe & Kaplan, 1996). Grabe and Kaplan (1996) believe introduction organization can be presumed to reflect cultural distinctions in writing across languages.

The research questions in this study are:

1. Are there any rhetorical differences between the Chinese and English introductions studied?
2. Are there any cultural differences reflected in the Chinese and English research article introductions (RAIs)?
3. Despite the relative uniformity imposed by the academic genre, is there intercultural variation between introductions written in Chinese and English?

To answer these questions, this study uses Swales' (1990) model of genre analysis to examine the rhetorical patterns and linguistic features of introductions in a corpus of forty academic articles written in English and Chinese published in various medical journals.

Through examination of the rhetorical patterns in Chinese and English RAIs, this study also provides insights into the nature of academic communication between

Chinese-speaking and English-speaking communities. The current research may be of pedagogical value for teaching English academic writing to Chinese writers.

2. Research design and methodology

Although many contrastive studies have focused on the rhetorical differences between texts written in English by scholars with different cultural backgrounds (Connor & Mauranen, 1999; Mohan & Lo, 1985; Ventola & Mauranen, 1991), more recent studies comparing English and Chinese have primarily concentrated on textual analysis of Chinese writing (Scollon, Scollon, & Kirpatrick, 1998). Since research in contrastive rhetoric (CR) began in 1966, scholars have followed different methods of analysis to study writing in a variety of languages. This means there are relatively few consistent discourse analytic approaches applied to studying student writing (Kaplan & Grabe, 2002).

The present study adopts Swales' (1990) genre analysis to look at the differences between English and Chinese introductions.

According to Swales (1990), the rhetorical structure of a particular genre is the result of conventions of a specific discourse community and can be analyzed using moves and steps. Hence this study uses Swales' (1990) genre analysis model to describe and compare the moves and steps in the selected English and Chinese RAIs.

2.1 Research design

For the purpose of this investigation, an English corpus and a Chinese corpus were built separately. Comparability is one of the major problems in many CR studies. That is, how to choose texts from two populations that are representative of the same genre, topic, and event but are still interesting enough to be worthy of comparison and likely to provide insights into important differences between the two populations (Tyson, 1999). Kaplan & Grabe (2002) have been criticized for comparing incompatible sets of data: native English speaker professional essays with ESL student writing. The present research selects texts of Chinese and English medical RAIs because of comparability and homogeneity in terms of the genre (research articles) and the field (medicine).

The Create a Research Space (CARS) model is a widely acknowledged structural pattern of RAIs in English writing (Swales, 1990). The CARS model

categorizes RA introductions into three rhetorical moves, and each move is further divided into several steps as indicated in Figure 1.

Move 1 Establishing a territory (obligatory)

Step 1—Claiming centrality (and/or)

Step 2—Making topic generalization(s) (and/or)

Step 3—Reviewing items of previous research

Move 2 Establishing a niche

Step 1A—Counter-claiming (or)

Step 1B—Indicating a gap (or)

Step 1C—Question-raising (or)

Step 1D—Continuing a tradition

Move 3 Occupying the niche (obligatory)

Step 1A—Outlining purposes (or)

Step 1B—Announcing present research

Step 2 —Announcing principal findings

Step 3 —Indicating RA structure

Swales (1990:141)

Figure 1 The CARS model for article introductions

To ensure reliability of the analysis of corpus data from the corpora, each RAI used in this study was coded using the CARS model. The articles were all examined in terms of Move-Step sequences and linguistic features. Each move and step was identified by analyzing the function and linguistic signals of each sentence. Individual sentences were classified into an appropriate step of the CARS model.

After the RAIs have been classified into moves and steps, it is possible to investigate rhetorical differences between the Chinese and English RAIs, revealing distinctive rhetorical structures. Through the linguistic realizations of moves and steps in each corpus, this study explores and analyzes the rhetorical structures and linguistic features of the Chinese and English medical RAIs.

2.2 Data collection

Nwogu (1997, p.121) describes three principles for choosing proper samples: representative, reputation, and accessibility. Apart from these criteria, the data analyzed should be up-to-date. The data for this study consists of forty introductions chosen from Chinese medical RAs and English medical RAs published in 2007 (see Appendices I and II for a complete list of the selected articles).

There are many English medical research articles and almost as many Chinese articles, but we needed the articles analyzed to have similar contents. One more consideration for including articles was that the articles were well-written. Thus the readership of the two versions should be professionals. For the English articles, they should be published in authoritative journals to ensure the research and the language are well-written and appropriate for comparative study.

The English corpus contains article introductions from four internationally recognized medical journals, namely ten texts from the *New England Journal of Medicine* (NEJM), eight from the *Journal of the American Medical Association* (JAMA), one from *The Lancet*, and one from the *Journal of Anatomy*. The Chinese introductions were taken from four well-known Chinese medical journals: seven texts from the *National Medical Journal of China* (NatlMed J China), four from the *Chinese Journal of Internal Medicine*, six from the *Chinese Journal of Surgery* and three from *Acta Physiological Sinica*. To ensure a variety of sources, an effort was made to avoid selecting two articles from the same author.

2.3 Research method

The CARS model is applicable for the analysis of introductions from various academic disciplines in English and other languages, and many researchers have employed this model to analyze article introductions (Fakhri, 2004; Guo, 2001; Jogthong, 2001). Duszak (1994) supports the potential application of the Move formula as a preliminary indicator of areas of comparability among various writing styles, including cross-cultural comparisons. In view of Swales' definition of genre, a move is seen as a communicative event and a step is a lower constituent unit than a move. In the CARS model, Swales marks three moves and each move contains a number of component steps indicated by specific linguistic signals (Table 1).

3. Data analysis and results

We analyzed the articles in terms of moves and steps, creating statistical representations of the forty coded Chinese and English medical RAIs.

3.1 Move-step analysis

Moves and steps were examined to reveal rhetorical structures and linguistic features of the Chinese and English RAIs. The results demonstrate different rhetorical patterns in the article introductions between the English and Chinese writers, which are described below.

3.2 Sample analysis

To better understand the CARS model and the definitions of moves and steps used, two examples of coded Chinese and English texts are provided below, in Tables 1 and 2. The examples illustrate how an introduction was coded in terms of moves and steps. All forty introductions were coded and tabulated this way. Using the CARS model, each sentence was marked and identified as representing a specific move and step. The English introduction is “Optimal Medical Therapy with or without PCI for Stable Coronary Disease” from *NEJM, Vol.356 No.15, .* The Chinese one is “冠状动脉介入治疗术后三联抗血小板治疗的近期疗效”[Short-term outcomes of triple antiplatelet therapy after percutaneous coronary intervention] from *NatlMed J China, 86(116), .*

Table 1 English RAI sample

Signal sentence(s)	Move-Step
(S1) ...the use of...has become common in...	1-2
(S2) ...and recent registry data indicate that...	1-3
(S3) ...but similar benefit has not been shown...	2-1A
(S4) This issue has been studied in...	1-3
(S5) Although...previous studies have shown only that...	2-1B
(S6) Thus...remains uncertain.	2-1C
(S7) Our study...was designed to determine whether...	3-1A

Table 2 Chinese RAI sample

Signal sentence(s)	Move-Step
(S1) 西洛他唑是一种新型抗血小板药物。	1-1
(S2) 基础研究表明,西洛他唑具有...临床研究也初步证实...	1-3
(S3) 近年发表的西洛他唑抗再狭窄研究(CREST)结果表明...	1-3
(S4) ...但目前对其疗效及安全性国内尚少见报道	2-1A
(S5) 本研究通过回顾性分析...	3-1B

3.3 Rhetorical structures of the introductions

Below, Table 3 describes the move structure of the forty Chinese and English RAIs that were analyzed. It shows that most of the RAIs under examination approximately conform to the three-move structure proposed by Swales (1990). In contrast with 90% of English introductions, 50% of Chinese introductions follow the CARS model, which represents a significant difference ($p < 0.05$). Compared with the English introductions, the Chinese introductions apparently exhibit rhetorical structures that vary from the CARS model.

The three-move structures were found to be unevenly distributed in both corpora. In the English corpus, all the introductions displayed Move 1. However, in one introduction no Move 2 was found and in another one no Move 3 was identified. In the Chinese corpus more introductions lacked Moves 2 and 3. The English and Chinese writers in the corpora both lay emphasis on Move 1 to establish the territory of their articles. It can be observed from Table 4 that in the case of Move 1 there was a slight difference between the English and Chinese corpus (42.86% vs. 51.76%). Compared with the other two moves, Chinese writers pay more attention to Move 1 so as to provide background information than English writers do. The least frequent move type was Move 2 in both corpora, which accounted for 22.35% of all the steps in the Chinese corpus. In contrast with Move 2, Move 3 represented more steps in both corpora. Move 3 is slightly more prevalent in the English corpus than in the Chinese corpus.

Table 3 Move structure of English and Chinese RAIs

English RAIs code	Move structure	Chinese RAIs code	Move structure
		E C1	-2-3 3 3
E2		C2	1-2-3-1 2-3-1
E3	1	C3	1-2-1-2-3 1-1-2-
E4		C4	1-3-1-2-3 1-2-3
E5		C5	3 1-2-3 1-2-3
E6		C6	1-2-1-3-1 1-1-3-
E7		C7	1-2-1-2-1 1-1-2-
E8		C8	2-3 1-3 1-3
E9		C9	1-2-3 1-2-3
E10	1	C10	1-3-1-2 -3-1-
E11		C11	-2-3 1-2 1-2
E12		C12	3 1-3 1-3
E13		C13	-3 1-2 1-2
E14	1	C14	C 1-2-1-2-3 1-2-3
E15		C15	1-3 1-3
E16		C16	1-3 1-3
E17	1	C17	C 1-3-1-3-2 1-3-2
E18		C18	2-1-3 2-1-3
E19		C19	3 1-3 1-3
E20		C20	-3 1-3 1-3

Note: the numbers in the second and fourth column sent the CARS model.

3.4 Linguistic realizations of moves and steps in the introductions

Compared with the move structure in the English articles, these three moves were shorter and simpler in the Chinese articles (Table 4). For example, one introduction in the Chinese corpus had the fewest of these moves. It only contained Move 3 and was missing the other two moves. This introduction just described the present research in detail, including its aim, method, and the source of collected data. Although the English introductions did not exactly fit the CARS model, most writers still attempted to orient the readers by utilizing the three moves of the CARS model. Each move is considered in more detail below.

Table 4 The count of moves in the English and Chinese introductions

Moves	EI		CI	
	No. of steps	Percentage	No. of steps	Percentage
Move 1	51	42.86	44	51.76
Move 2	33	27.73	19	22.35
Move 3	35	29.41	22	25.88

Note: EI means the introductions of the English corpus; CI means the introductions of the Chinese corpus.

Move 1: Establishing a territory

Move 1 is regarded as obligatory by Swales (1990). In the case of the English introductions, all utilized Move 1 in the English corpus, as demonstrated in Table 6. However, one Chinese writer omitted this move in the introduction. In the English and Chinese corpora, none of the article introductions utilized all the three optional steps in Move 1. The frequency of the three optional steps was unequal and varied in both corpora (Table 5).

Mostly, these centrality claims (Step 1) are identified at the beginning of Move 1, which mainly comes at the start of the introductions. Step 1 was more frequent in the Chinese corpus than the other two steps (Steps 2 and 3). Step 2 (making topic generalizations) appeared least frequently in Move 1 in both corpora. Some longer introductions use a cyclical pattern of literature review (Swales, 1990). Hence, Step 3 (reviewing previous research) is believed to be the most frequent step in this move. In the English corpus this step proved to be frequent and represented 52.94% of steps in Move 1. However, in the Chinese corpus this step occurred less frequently, representing 34.09% of all the steps in Move 1.

Table 5 Analysis of move 1

N1= 51 (42.86%), N2= 44 (51.76%)

Steps	EI		CI	
	No. of steps	Step / N1 (%)	No. of steps	Step / N2 (%)
Step 1	17	33.33	18	40.90
Step 2	7	13.73	11	25.00
Step 3	27	52.94	15	34.09

Note: N1 means the number of steps in Move 1 of the English corpus; N2 means the number of steps in Move 1 of the Chinese corpus.

Swales (1990) categorizes citations into two major types—integral and non-integral. In integral citations, the name of the cited research appears in the sentence as some sentence element, while in the non-integral type it is placed in parenthesis or referred to in a footnote.

In the selected corpora, citations varied greatly in number between the Chinese and English introductions. As seen in Table 6, English writers used more than 200 citations, while Chinese writers only used 48 citations. Chinese writers seemed to disregard the importance of this step, averaging two citations per article compared with ten citations per article in the English introductions. In the English corpus, non-integral citations were more common than integral citations, whereas integral and non-integral citations were used approximately equally in the Chinese corpus.

Table 6 The number of citations per corpus including integral and non-integral citations

No. of citations	EI		CI	
	Integral	Non-integral	Integral	Non-integral
	47	162	27	21
Total	209		48	
Mean	10.45		2.4	

Move 2: Establishing a niche

Move 2 has received a considerable amount of attention in previous studies on article introductions, especially articles written in a language other than English (Fakhri, 2004; Jogthong, 2001). The analysis of Move 2 in the corpora is presented in Table 8. Similar to step occurrence in Move 1, the distribution of step types in Move 2 was unequal and uneven in the introductions of both corpora.

One of the key features of the selected introductions was the absence of steps from Move 2 in the Chinese corpus. In the Chinese corpus, Move 2 was the least frequent move, as Table 6 demonstrates.

Move 2 comprises four step options. Out of the four options, Step 1A (counterclaiming) was the preferred means of niche establishment in the English corpus. In the Chinese corpus it was only employed four times. It was a frequent step

type in the Chinese introductions, and so was Step 1C (question-raising). Compared with Step 1A, the other three steps were less common in the English corpus. In the Chinese corpus, these four step options were seen to be in a similar ratio of distribution. The percentage of Step 1D (continuing the tradition) distribution was shown to be relatively higher compared to that of the distribution of the three steps in the Chinese introductions. Table 7 shows Chinese writers favor continuing the tradition to niche establishment. Nevertheless, English writers tend to make counterclaims about the previous research which is a direct way to establish a niche.

Table 7 Analysis of move 2

N1= 33 (27.73%), N2= 19 (22.35%)

Steps	EI		CI	
	No. of steps	Step / N1 (%)	No. of steps	Step / N2 (%)
Step 1A	18	54.55	4	21.05
Step 1B	6	18.18	5	26.32
Step 1C	5	15.15	4	21.05
Step 1D	4	12.12	6	31.58

Note: N1 means the number of steps in Move 2 of the English corpus; N2 means the number of steps in Move 2 of the Chinese corpus.

Move 3: Occupying the niche

Whenever Move 2 occurs, Move 3 can substantiate the counterclaim that has been made, fill the created gap, answer the specific question or continue the rhetorically established tradition (Swales, 1990, p. 159). Table 8 shows that Move 3 was a common rhetorical structure in most English and Chinese introductions.

The obligatory element in Move 3 is Step 1, which has two options. Step 1 was present in most of the English and Chinese introductions. In the English corpus, Step 1B was the most preferred means to occupy the niche, representing 10.08% of all the steps in the corpus. In the Chinese introductions, Step 1B was also the most frequent step type in Move 3. Step 1A was also frequent in the Chinese corpus.

Step 2 (announcing principal findings) was the least frequent type in the case of Move 3 in both the English and Chinese corpora. In the English corpus Step 2 only constituted a smaller percent (14.29%) in the whole step options. The frequency of this step was the lowest in the Chinese corpus (9.10%). Step 3 (indicating the article structure) was absent in most introductions in both corpora. Even though it appeared

in some articles, this step contained a few simple sentences, with reference to only one or two sections indicating article structure. The ratios of Step 2 and 3 within the corpora indicated a lack of preference for announcing findings and the article structure in both the English and Chinese introductions.

As seen from Table 8, Step 1B was identified as the most frequent step type in the case of Move 3 in the English and Chinese corpora, which is employed to identify the focus of the study and present the research arguments. Step 2 was the least frequent step type favored by the Chinese and English writers in the corpora, which implies writers do not report their findings in their introductions.

Table 8 Analysis of Move 3

N1= 35 (29.41%), N2= 22 (25.88%)

Steps	EI		CI	
	No. of steps	Step / N1 (%)	No. of steps	Step / N2 (%)
Step 1A	10	28.57	8	36.36
Step 1B	12	34.29	9	40.91
Step 2	5	14.29	2	9.10
Step 3	6	17.14	3	13.60

Note: N1 means the number of steps in Move 3 of the English corpus; N2 means the number of steps in Move 3 of the Chinese corpus.

4. Discussion of the findings

Our findings show that the rhetorical moves of RAIs are heterogeneous in both corpora. Most of the introductions in the corpora contain all the rhetorical moves but are not arranged in a consistent sequence. The rhetorical structures of the English corpus more consistently follow the CARS model, including all three moves, while the Chinese corpus includes more deviations from the CARS model. Some moves recur in some introductions in both corpora. The English and Chinese introductions also elaborate and omit some moves and steps.

The English and Chinese introductions exhibit significant variance in move structure, particularly in steps. The discussion of previous research is qualitatively and quantitatively different between the English and Chinese RAIs. In the hopes of describing these differences, this section discusses the findings of our research at the macro-structural and the micro-linguistic level.

4.1 Findings at the macro-structural level

At the macro-structural level, examination of the rhetorical structure of RAIs by English and Chinese writers reveals that the three-move structure remains the established norm in both corpora.

Chinese and English writers both lay emphasis on Move 1 to claim the importance of the issue through providing background information. Linguistic signals that characterize this move in Chinese introductions are similar to those used by English writers. In niche establishment, the English and Chinese writers both adopt similar rhetorical strategies, such as counterclaiming and indicating the gap to identify the main issue. Whenever a niche is established in Move 2, it is followed by Move 3 with the function of filling the niche. In occupying the niche, writers from both corpora tend to state the purpose of and to describe the research. Most of the English and Chinese writers favor Step 1 (outlining the purpose or announcing present research) when Move 3 is present. Step 1 is highly distributed in Move 3 in both corpora. However, most Chinese and English introductions do not contain Step 2 or 3. Compared to previous RAI research (Swales, 1990; Taylor & Chen, 1991), in this study fewer introductions announce principal findings and indicate RA structure.

In contrast with rhetorical moves elaborated in the English corpus, certain rhetorical moves in the Chinese corpus are sometimes simplified or shortened. For example, one introduction in the Chinese corpus, with the simplest move, has only Move 3. Although the English introductions do not always exactly, and completely fit the CARS model, English writers show a propensity to utilize all three rhetorical moves in their introductions. Swales (1990) points out that recycling different moves or steps is expected to occur frequently in longer introductions. In the English corpus, writers tend to repeat or elaborate certain steps or moves, but Chinese writers are prone to simplify rhetorical moves.

Within the CARS model, English and Chinese writers make choices of different steps in the introductions. In the present study, various move and step preferences emerged. The differences between the two corpora are mainly found in the unequal occurrences of moves and steps. The question remains of how to account for this difference.

The diversity of the rhetorical structures identified in the Chinese and English corpus could be attributed to the different academic backgrounds the writers have been exposed to. Chinese essay writing norms are inconsistent with English essay writing norms and Chinese and English speakers have different educational

backgrounds that are characteristic of their different cultures. These different backgrounds manifest in their academic writing, despite certain universal features of the academic writing genre.

In this study, 90% of the English introductions fit the CARS model, whereas half of the Chinese introductions follow the model. Culturally speaking, primacy of content or meaning over form is preferred in Chinese academia in contrast to English academia where form is considered more important. Western scholars have argued Chinese structure and culture influence the English writing of Chinese students, causing it to be indirect or digressive (Kaplan, 1996). In fact, inductive writing is preferred over deductive in most Chinese writing, as Hinds (1990) demonstrates. The data from this study indicates Move 1 plays a larger part in Chinese introductions than in English introductions, which serves to demonstrate the primacy of background information in Chinese writing.

In the Chinese corpus, the lower figure of Step 3 of Move 1 indicates less discussion of previous research in introductions. It could imply that Chinese writers undertake the writing task as individuals, without fully identifying themselves as members of the academic community. This could also be seen from the smaller number of citations in the Chinese introductions, indicating Chinese writers may tend to overlook citing other research and use fewer references than English writers. This could perhaps be ascribed to the lack of academic education at school and the competitive research environment in Chinese academia.

The low frequency of Step 3 of Move 3 in both corpora in this research potentially refutes the widely accepted view that in the majority of cases researchers indicate the structure of their RAs in their introductions.

4.2 Findings at the micro-linguistic level

In their introductions, different writers make different linguistic choices to realize the function of certain moves or steps. Just as Swales (1990) notes that within the overall CARS structure, cultural variation is possible and writers can make specific rhetorical choices, different rhetorical preferences appear in the English and Chinese introductions.

The review of the literature in the introductions is a step that does not just establish the territory but can also be employed to realize steps that belong to other moves, such as Step 1 of Move 3. Consequently discussion of previous research is of

paramount importance in the introduction. The review of previous research accounts for the presence of many citations throughout the articles. References to previous research perform more rhetorical work than just providing information on the territory within which the topic of the paper is situated (Samraj, 2002). Typically, the writers review previous research, identify a gap or raise a question, and propose to solve this problem to establish a niche. In the present research English and Chinese writers make different strategic choices in the critical review of previous research.

Chinese writers apparently disregard the importance of reviewing previous research, as there are, on average, only two citations in the Chinese introductions. Seven Chinese introductions do not include any citations. Sometimes even though other research is cited, Chinese writers do not criticize or challenge that research. Chinese writers tend to continue the tradition as a means of establishing a niche, perhaps because this rhetorical option is more secure or practical for them. When citing other research, Chinese writers are inclined to state that the previous research is incomplete or their present research is conducted from another perspective to avoid conflict. The majority of Chinese introductions avoid critical evaluation of previous research. By contrast, English writers tend to criticize previous research to establish the area they intend their research to address.

As suggested in previous studies, the absence of evaluation of previous research can be attributed to the unacceptability of argumentative styles and self-promotion in the cultures considered (Jogthong, 2001). This explanation may be partially valid in the present study. In this study, cross-cultural variations in research writing between the English and Chinese academic communities need to be considered.

There are two forms of research writing in academic contexts: knowledge telling and knowledge transforming (Grabe & Kaplan, 1996). In knowledge telling, the writer defines the task of writing as one of reporting knowledge that is relevant to the topic. In contrast, knowledge transforming writers define the task of writing as involving the modification of the retrieved information for the purposes of the essay. Knowledge transforming requires more reflection and critical evaluation. Based on this, we could assert that the English-speaking academic environment is knowledge transforming while in Chinese academia, knowledge telling is sufficient. Thus, many Chinese RAs had fewer citations and less critical evaluation of previous research.

Some other interesting linguistic features, although minor, are found in the Chinese introductions and absent from the English introductions. Even though the

selected articles are academic, some embellished language appears in Move 1 of a few Chinese introductions. One example is, “*Since the dawn of human civilization*, natural products, including NPs or secondary metabolites of microbial, plant, animal, and human origin, have played a crucial role in the treatment of human health and disease” (*Chinese Journal of Internal Medicine*, November 2006, Vol 45, No. 11, P. 61). This is a translated sentence and the phrase in italics is usually used in literary texts. Such flowery expressions are not a principal strategy used by the Chinese writers to establish territory but they are used occasionally. Language such as hyperbole, metaphor, and parallel expression are supposed to be employed by Chinese writers to make the writing interesting or attract readers’ attention. The use of such language could probably be justified as a means to convey the importance of the main issue. However, these embellished expressions could be deemed inappropriate for academic writing according to western scientific writing norms. In the English corpus, none of the English writers employ such strategies.

Another distinctive linguistic feature is the appearance of some understatements in some Chinese introductions. Some Chinese authors understate their research to show their respect to other researchers, avoid criticism, or show honesty and modesty. Such humble expressions are characteristic of Chinese culture. However, in the English corpus, no such expressions are found.

In general, academic writing is expected to appear impersonal, use apparently objective language, and avoid seemingly embellished language. Although ornamental language was not common in the Chinese introductions, the fact that it is present at all is noteworthy.

To end, the research questions raised in the introduction section could be answered through application of the CARS model to the Chinese and English introductions. The English and Chinese corpora exhibit significant differences in rhetorical structures and linguistic features. Although the underlying structure of introductions is thought to be universal, some aspects of Chinese and English RAI discourse organization is culturally specific.

4.3 Summary of findings

Previous CR studies mainly argue whether there are rhetorical differences between English and Chinese writing or not. Numerous studies have been conducted to examine and compare English native-speaker essays with Chinese ESL/EFL student

essays. In many cases comparison is difficult as the writing is not comparable in genre, intended audience, or rhetorical purpose (Tyson, 1999). The present genre-specific study attempts to avoid such problems to ensure validity through comparison of research article introductions published in established academic journals, thus providing better insights into the rhetorical structure and academic writing styles of the two languages.

An investigation of 20 RAIs written in English and 20 in Chinese was carried out using the CARS model to analyze their structure in terms of moves and steps (Swales 1990). Most introductions conform to the rhetorical structure of CARS. However, there are some irregularities in the sequence of moves and steps between the selected introductions. In terms of steps, the smaller structural constituents, there is a distinct difference in structural patterns between Chinese and English RAIs.

At the macro-structural level, the moves and steps described by the CARS model are unevenly distributed in the English and Chinese corpus. Nearly 90% of English articles follow the CARS model with a little reordering or elaboration. On the contrary, only half of the Chinese introductions analyzed exhibit components of all three moves. In contrast with English introductions, Chinese introductions apparently exhibit greater variance in rhetorical structure.

At the micro-linguistic level, this study explored and discussed the linguistic choices of negative review or critical evaluation of the previous research in English and Chinese introductions. The analysis reveals significant differences in the quality and quantity of cited literature in introductions between the two languages. Chinese writers tend to avoid critical evaluation of other research and some use self-citation as a way to continue the research tradition their papers are addressing. Chinese writers prefer positive review and English writers negative review. Chinese writers favor mitigated criticism when critical review is required whereas English writers prefer direct and critical evaluation of previous research. Some embellished language, inappropriate for the genre of academic writing, appears in the Chinese corpus.

Previous studies do not reach a consistent conclusion about differences between the discourse structure of Chinese writing and English writing. Some researchers contend that there is a difference (Ramsy, 2001), whereas others argue there is no difference (Mohan & Lo, 1985; Taylor & Chen, 1991). This study verifies Ramsy's (2001) conclusion that the discourse structure of Chinese RAIs is different from those of English RAIs. Chinese and English writing have greater differences at the micro-

linguistic level than at the macro-structural level, which to some extent indicates the universal characteristics shared in the genre of academic writing. However, the linguistic realizations of the CARS model are simpler in Chinese introductions. Despite relative uniformity imposed by the genre, there is some intercultural variation in the rhetorical preferences of writers (Valero-Garces, 1996). In this study, the differences shown indicate rhetorical variations at the macro-structural and micro-linguistic levels. This variation can perhaps be attributed to social and cultural differences between the Chinese and English academic communities.

5. Theoretical and practical implications

The findings of the present study can shed light on genre-specific CR research in general. Since the present study relates genre analysis to CR studies, our findings have theoretical and practical implications for CR research, medical academic writing, and teaching.

5.1 Contribution to contrastive rhetoric research

This study probes into the underlying rhetorical conventions of Chinese and English medical RAIs and shows that Chinese and English academic medical texts exhibit differences in their rhetorical structures and linguistic features. The most obvious application of these findings is to enhance cultural awareness for teachers and students. Kaplan (1998, cited in Saez, 1999) maintains that different composing conventions do exist in different cultures and that these different conventions need to be addressed in teaching composition. This genre-specific CR study can be a way to appreciate rhetorical differences between Chinese and English, which can help to advance communication between the two communities. We show that Chinese and English writers organize the writing of introductions in different ways, pointing to the necessity of fostering an awareness of different rhetorical styles among ESL professionals. As suggested by Kachru (1999), it is equally legitimate and desirable to raise the consciousness of ESL professionals regarding the different rhetorical conventions of ESL/EFL learners.

5.2 Significance for English academic medical writing and teaching

As the CARS model is visible in many Chinese and English introductions, an important theoretical implication emerges; and that is academic discourse shares

certain universal characteristics. In academic writing and teaching, it is important to keep in mind the patterns of specific genres.

However, compared with English articles, Chinese introductions exhibit more divergence from the CARS model. In order to enter the academic world, academic writers need to be aware of the beliefs, values and conventions used by professionals in the discourse community (Duszak, 1994; Swales, 1990). In order to be accepted by the readers of a discourse community, one is required to write appropriately and to follow conventional styles of discourse (Leki & Carson, 1997; Raimes, 1991). In the professional and academic field, sophisticated generic writing skills are particularly critical for writers whose native language is not English. Therefore, conforming to generic structures is a requirement for Chinese scholars to publish their English RAs in international journals. The results of this investigation can hopefully assist Chinese scholars to write English in ways that will allow their work to be accepted by English academic journals in a world where English is the dominant language of academic discourse.

Likewise, the results provide information and better analytical tools for Chinese students to understand how Chinese and English academic writers organize academic texts and to meet the expectations of the discourse community they hope to join.

From the genre analysis, Swales (1990) concludes that “there may be pedagogical value in sensitizing students to rhetorical effects, and to the rhetorical structures that tend to recur in genre-specific texts” (p.213). Genre-based pedagogy, defined as the teaching of macrostructures and the organization of texts, now sees widespread use in teaching the academic English writing (Leki, 1997; Swales, 1990). Just as Clyne (1987) concludes, “it is up to academics from English and non-English educational backgrounds to learn to understand and respect one another’s discourse patterns” (p.82). The present study helps to advance medical communication between English and Chinese academics.

6. Limitations of the study and suggestions for further research

This study examined the genre of RAIs in Chinese and English. In the analysis, rhetorical structures of Chinese and English introductions were identified according to moves and steps. However, it is impossible to achieve absolute and complete validity in identifying specific moves and steps as it is difficult to establish clear and unambiguous boundaries between moves. The research findings suggest differences

exist in the writing of Chinese and English introductions, illustrating the cultural variables in cross-linguistic writing. Nevertheless, the explanation of the differences is tentative and requires further verification.

Given the small scale of this study, the findings can only be regarded as preliminary and tentative. Each corpus demonstrates its own preferred rhetorical structures and distinctive linguistic features. Since the data are culled from the discipline of medicine, further research on rhetorical variation across different academic disciplines is needed to verify that the trend persists across genres. This study shows that research on introductions from a cross-cultural perspective is significant, and therefore further CR research in the genre of introductions and other academic writing would be valuable. In light of the present study, genre-specific CR studies are interesting and worthy of more in-depth investigation.

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Appendix I English Articles Used for Analysis

- Optimal Medical Therapy with or without PCI for Stable Coronary Disease (*NEJM*, Vol.356 No.15, April.12 2007)
- Mother-to-child transmission of HIV-1 infection during exclusive breastfeeding in the first 6 months of life: an intervention cohort study (*The Lancet*, Vol. 369, 2007)
- Emergency Duties and Deaths from Heart Disease among Firefighters in the United States (*NEJM*, Vol.356, No.12, March 22, 2007)
- Morphological characterization of GFP stably transfected adult mesenchymal bone marrow stem cells (*Journal of Anatomy*, Vol. 208, January, 2006)
- Mortality Associated With Aprotinin During 5 Years Following Coronary Artery Bypass Graft Surgery ([JAMA](#), Vol. 297, Feb 7, 2007)
- Computed Tomographic Pulmonary Angiography vs Ventilation-Perfusion Lung Scanning in Patients With Suspected Pulmonary Embolism (*JAMA* Vol. 298 No. 23, December 19, 2007)
- Implementation of a Statewide System for Coronary Reperfusion for ST-Segment Elevation Myocardial Infarction (*JAMA* Vol. 298 No. 20, November 28, 2007)
- Antibiotics and Topical Nasal Steroid for Treatment of Acute Maxillary Sinusitis (*JAMA* Vol. 298 No. 21, December 5, 2007)
- Genomewide Association Analysis of Coronary Artery Disease (*NEJM* Volume 357:443-453 [August 2, 2007](#) Number 5)
- High-Dose Chemotherapy and Stem-Cell Rescue for Metastatic Germ-Cell Tumors (*NEJM* Volume 357:340-348 [July 26, 2007](#) Number 4)
- Long-Term Mortality after Gastric Bypass Surgery (*NEJM* Volume 357:753-761 [August 23, 2007](#) Number 8)
- Saline or Albumin for Fluid Resuscitation in Patients with Traumatic Brain Injury (*NEJM* Volume 357:874-884 [August 30, 2007](#) Number 9)
- Hemoglobin Variants and Disease Manifestations in Severe Falciparum Malaria (*JAMA* Vol. 297 No. 20, May 23/30, 2007)
- Folic Acid for the Prevention of Colorectal Adenomas (*JAMA* Vol. 297 No. 21, June 6, 2007)
- Clinical Course and Prognosis of Smoldering (Asymptomatic) Multiple Myeloma (*NEJM* Volume 356:2582-2590 [June 21, 2007](#) Number 25)

Surgery versus Prolonged Conservative Treatment for Sciatica (*NEJM Volume 356:2245-2256* [May 31, 2007](#) Number 22)

Survival after Treatment with Phenylacetate and Benzoate for Urea-Cycle Disorders (*NEJM Volume 356:2282-2292* [May 31, 2007](#) Number 22)

Eprodisate for the Treatment of Renal Disease in AA Amyloidosis (*NEJM Volume 356:2349-2360* [June 7, 2007](#) Number 23)

Nonvalidation of Reported Genetic Risk Factors for Acute Coronary Syndrome in a Large-Scale Replication Study (*JAMA Vol. 297 No. 14, April 11, 2007*)

One-Year Cardiovascular Event Rates in Outpatients With Atherothrombosis (*JAMA Vol. 297 No. 11, March 21, 2007*)

Appendix II Chinese Articles Used for Analysis

1. 冠状动脉介入治疗术后三联抗血小板治疗的近期疗效 (*中华医学杂志 2006 年 4 月 25 日第 86 卷第 16 期 NatlMed J China, April 25, 2006, Vol 86, No116*)
2. 诊断性脾切除术对不明原因发热伴脾肿大的临床意义 (*中华医学杂志 2006 年 12 月 26 日第 86 卷第 48 期 NatlMed J China, December 26, 2006, Vol 86, No148*)
3. 早幼粒细胞白血病蛋白在肺癌中的表达及其临床意义 (*中华医学杂志 2006 年 12 月 19 日第 86 卷第 47 期 NatlMed J China, December 19, 2006, Vol 86, No147*)
4. 转化生长因子 β 1 及其受体基因过量表达与进展期胃癌分化及临床预后的关系 (*中华医学杂志 2006 年 12 月 12 日第 86 卷第 46 期 NatlMed J China, December 12, 2006, Vol 86, No146*)
5. 重组人骨形态发生蛋白-2 对内毒素致急性肺损伤大鼠肺动脉压力的影响及其机制 (*中华医学杂志 2006 年 12 月 5 日第 86 卷第 45 期 NatlMed J China, December 5, 2006, Vol 86, No145*)
6. 刮吸解剖法在腹部复杂手术中应用及技巧探讨 (*中华医学杂志 2006 年 11 月 28 日第 86 卷第 44 期 NatlMed J China, November 28, 2006, Vol 86, No144*)
7. 伴皮质下梗死和白质脑病的常染色体显性遗传性脑动脉病血液动力学研究 (*中华内科杂志 2006 年 12 月第 45 卷第 12 期 Chin J InternMed, December*

2006, Vol 45, No. 12)

8. 胃癌组织RASSF1A甲基化对其mRNA及蛋白表达的影响 (中华内科杂志 2006年12月第45卷第12期 Chin J InternMed, December 2006, Vol 45, No. 12)
9. T淋巴细胞活化诱导的细胞死亡在肾综合征出血热发病中的作用 (中华内科杂志 2006年11月第45卷第11期 Chin J InternMed, November 2006, Vol 45, No. 11)
10. 生长抑素类似物在垂体促甲状腺激素瘤诊断和治疗中的作用 (中华内科杂志 2006年11月第45卷第11期 Chin J InternMed, November 2006, Vol 45, No. 11)
11. 腰椎间盘造影在椎间盘源性腰痛诊治中的应用 (中华外科杂志 2006年12月第44卷第24期 Chin J Surg, December 2006, Vol 44, No 24)
12. 活动和固定衬垫型假体在全膝关节表面置换术中的早期临床比较研究 (中华外科杂志 2006年12月第44卷第24期 Chin J Surg, December 2006, Vol 44, No 24)
13. 肝内胆管结石合并急性胆管炎的肝切除时机 (中华外科杂志 2006年12月第44卷第23期 Chin J Surg, December 2006, Vol. 44, No. 23)
14. 不停跳冠状动脉旁路移植术联合同期肺切除术 (中华外科杂志 2006年11月第44卷第22期 Chin J Surg, November 2006, Vol 44, No 22)
15. 内镜下经单鼻孔2蝶窦切除垂体腺瘤 (中华外科杂志 2006年11月第44卷第22期 Chin J Surg, November 2006, Vol 44, No 22)
16. 腹腔镜可调控性胃捆扎带减肥术治疗病态肥胖术后并发症的诊治 (中华外科杂志 2006年11月第44卷第21期 Chin J Surg, November 2006, Vol. 44, No. 21)
17. 产前应激子代大鼠海马核转录因子- κ B表达的性别差异 (生理学报 Acta Physiologica Sinica, December 25, 2006, 58(6): 577-583)
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20. 内科介入技术与外科手术镶嵌治疗小儿先天性心脏病 (中华医学杂志 2006

年4月25日第86卷第16期 *NatlMed J China, April 25, 2006, Vol 86,*
No116)



**Electronic Syllabus Design for *Language & Computers*:
Bridging the Gap Between Two Disciplines Using *Moodle* as a
Learning Management System (LMS)**

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Biodata

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Abstract

In the past decade, the widening use of computers has had a profound influence on the design and structure of the linguistics curricula. Because the internet has now become the main resource for linguists, academic institutions have deemed it necessary to integrate into the linguistics curriculum courses that are geared to identification and use of various online linguistic resources and software. However, instructors have found it difficult to identify the basic components or topics that should be incorporated into the standard Language and Computer course. The purpose of this study is twofold: first to outline the core contents of a Language and Computer course; and second, to demonstrate how to convert the delivery of this content from face-to-face to online or blended delivery using *Moodle* as a Learning Management System (LMS). This study investigates the basic steps to structuring an online Language and Computers course and identifies the technology that provides a meaningful learning environment. It is basically a study in electronic syllabus design that is aimed at bridging the gap between Language & Computers and Computational

Linguistics by integrating components of both disciplines into a new hybrid course that involves the acquisition of basic computational expertise as well as mastery of software programs for analyzing natural language. An outline of the course is provided and a detailed discussion of the methods of implementing and designing its electronic syllabus, with some speculation on the computational and linguistic outcomes of combining both disciplines.

Keywords: Language & Computers, Moodle, Learning Management Systems (LMS), Computational Linguistics, Blended Delivery

1. Introduction

According to Lawler and Dry (1998) and Hoard (1998), computing has had a dramatic impact on the discipline of linguistics and is shaping the way we conceptualize both linguistics and language. There is now a growing tendency to ensure that linguistic theories are computationally effective. Widening interactions of human language and computers have also had a profound influence on the design and structure of the linguistics curricula. This study presents the results of constructing a graduate level course in Language and Computers (L&C) using Moodle as a course management system. An outline of the course is provided along with a detailed discussion of the method of implementing and designing the electronic syllabus of the course, with some speculation on its computational and linguistic outcomes. Also included is a discussion of the technology problems encountered in teaching an online linguistics course.

Because the internet has become the main resource for linguists, it has become necessary to integrate courses geared to identification and use of various online linguistic resources and software in all subfields of linguistics. As a result, L&C has recently emerged as a new area within the field of linguistics. However, because of the overwhelmingly broad scope of this domain, instructors have found it difficult to design a standard anatomy of an L&C course. What are the basic components or topics that should be incorporated in any introductory course? A basic problem appears to be the blurred distinction between this discipline and that of computational linguistics (CL); a subfield of linguistics and computer science that is concerned with the application of the concepts of computer science to the analysis of language. An online survey of L&C courses revealed that the syllabi of almost all of these courses were geared to

CL, requiring prior knowledge of main concepts in computer science and related fields. None addressed students of linguistics or involved basic training in computer software for the analysis of texts. This course in L&C is designed to be a hybrid course, involving the acquisition of basic computational expertise as well as mastery of software programs for analyzing natural language.

Hence, this paper presents an approach for combining CL and L&C, aiming at bridging the gap between the two disciplines. The following section will highlight the basic distinctions between these two domains as well as identify the features of CL that need to be incorporated into any hybrid model. It is important to note at the outset that although this course is interdisciplinary, it is geared primarily to students of linguistics. The goal is not to teach students computer programming but to train them in the use of software developed for linguistic analysis, to provide them with the necessary technical skills needed to evaluate the efficiency of these programs, and through mobilizing their solid command of modern theories of linguistics in all levels whether phonological, morphological, semantic, or discourse analysis, to suggest ways of improving and updating these tools. Indeed, as scholars have pointed out (Hajič 2004), one very important aspect of CL, as opposed to many other areas in the humanities, is its ability to be evaluated using a gold-standard result. While many of the concepts introduced in this course are familiar enough in computer science circles, particularly the domain of CL, aspects of these concepts are problematic to students trained in the social sciences. It must also be noted that the approach adopted in this study is similar to the methods used in 'Digital Humanities,' a new domain that is slowly emerging as a discipline in its own right and which has its origins in textually focused computing in the humanities and concerns itself with the automation of the discourse of written texts from music and painting to phonetics and cognitive stylistics (for a thorough explanation of this field see Schreibman, Siemens & Unsworth 2004).

2. Language & computers: A necessary distinction

CL is a field of science that deals with computational processing of natural language (Hajič 2004). Theoretical CL deals with formal theories of language description at various levels, such as phonology, morphology, syntax, semantics, discourse structure and lexicology. Applied CL tries to solve well-defined problems in the area of natural processing such as tagging (disambiguation of parts-of-speech and/or morphological

functions in sentential context), parsing (discovering the structure of sentences), and word sense disambiguation (solving polysemy in sentential context).

CL is thus a discipline between computer science and linguistics, for which the main concern is the computational aspects of human language. These are aspects that can be put into the form of a sequence of instructions (i.e., grammatical or semantic) that computers can understand (Inchaurrealde 2005). Researchers identify the central question in CL as this: "What would a computer program have to capture to enable a robot, another device, or the computer itself to analyze, understand, and create sentences, paragraphs, or even entire essays?" (Klavens 2001:664). The course discussed in this study is not at the crossroads of linguistics and computer science, but rather a new specialization within formal linguistics that incorporates features of CL (apart from computer programming) and is geared to analyzing language through the use of software. In some ways, these two disciplines can be seen as overlapping. Both computational linguists and linguists who specialize in the use of computer applications are dependent on linguistic theories. One main difference is that in CL it is the designing of software for language analysis that is the main object of study, whereas in L&C, software is used as a resource for analyzing language and discourse. Obviously, both groups do a lot of the same things. Unfortunately, they have been working almost entirely independently of one another. To date, many linguists are unaware of the great challenges of CL, and conversely many computational linguists using and designing advanced computerized systems are typically unaware of the linguistic issues involved. Thus, an ideal outcome of a course in L&C would be for students of linguistics to collaborate with computer scientists in the design of new software for the analysis of natural language.

3. Method of delivery

This dramatic impact of computers on the discipline of linguistics has in turn led to paradigm shifts not only in the way we teach linguistics but also in the methods we choose to deliver linguistics. Learning Management Systems (LMS) like Blackboard and Moodle offer linguists interested in computational technologies significant benefits. They can facilitate teaching, allowing instructors to provide a practical and iconic introduction to the different aspects of the interaction of computing and linguistics: the Internet, software for fieldwork, and teaching linguistics. At the same time, these systems are reshaping student perceptions, immediately transporting

students to an enriched online environment that allows them to experience firsthand the dramatic interaction between both disciplines, bringing to light new affinities which only an online course can generate. Although there is no published research to substantiate this claim, it is taken as axiomatic that mobilizing the same channel for both instruction and syllabus design will not only enhance the computer skills of students but also provide them with a pragmatic hands-on awareness of how computers can assist with the analysis of texts. Required online activities such as participating in forums, uploading assignments, and collaborating in wiki projects, may make students more receptive to the complex computational activities that the course entails such as parsing, tagging and linguistic annotations. The present study describes the process of constructing an L&C course in which features of Moodle technology are used to complement and enhance face-to-face instruction.

4. Course description

The design pattern of the course is that of an advanced skills development course (Cole & Foster 2007) where the aim is to give students the opportunity to apply basic linguistic concepts learned in other courses as well as to apply new computational concepts introduced in the course and explore various aspects of the field in more detail. This type of course focuses on repetitive application of important skills. The goals include development of automaticity in some skills, refining skills performances, and dealing flexibly in skill application.

This study attempts to offer specific guidance to linguists who wish to take advantage of *Moodle* to design their course, focusing on the choices offered to students, and the challenges instructors currently face in integrating an online site into an L&C course. The course described in this paper aims at helping instructors not only familiarize themselves with the technology, but also find and develop the computer-readable materials needed for the course. It is structured as a 3-credit-hours blended course. Students meet for three hours once a week and are expected to establish a consistent online presence by contributing to electronic discussions and chats at least three times per week. All coursework and assignments are submitted electronically as email attachments or uploaded to the course homepage. Task-based learning is implemented through the practice of a wide range of group and individual activities, both in and out of class. A number of *Moodle* technology features are utilized, ranging from discussion forums, chats, online assignment submission,

instantaneous teacher feedback, and journal writing to glossary creation, wikis, and collaborative websites.

5. Students and online readiness

This interactive course was specifically designed for beginning graduate students of linguistics who possess some knowledge of computers. It serves to make students more aware of the computer's potential as a powerful tool for "the ordinary working linguist (OWL)" (Simons 1998:10). First and foremost, it assumes a minimum of computational knowledge on the part of students even though the general computer literacy among graduate students of linguistics is generally high. This is basically because students never claim confidence in learning new technologies. As Lawler & Dry (1998) explain, experience suggests the computer knowledge of most linguists is "spotty" rather than "systematic" since often "it is required 'on the fly' in bits and pieces, under pressure of the need to solve a particular problem or perform a specific task" (p. 2). As Lawler & Dry (1998) suggest, it is best to "begin at the beginning" (p. 2), even on topics they already know something about.

A total of 10 students were enrolled in the class. However, after the first week, once the computer skills needed for the course were made clear, four students elected to drop out. The remaining six were more confident in their computer skills and hence better motivated and more eager to prove their competence. For these students, unfamiliarity with CL was seen as an opportunity rather than an obstacle. All six students were homogeneous in terms of their ages, backgrounds and perspectives, as well as their physical locations (Jeddah, Saudi Arabia). Although the sample of respondents upon which this research is based is relatively small, it should in no way compromise the results of this study nor should it be viewed as an important indicator of survey quality. It is also significant to note that graduate classes in linguistics departments are on average very limited in terms of enrollment. A typical graduate class in many institutions worldwide would not include more than fifteen students at most. As such, the sample of respondents in this study is representative of the field in general and it therefore does not necessarily differentiate reliably between accurate and inaccurate data. In addition, the two instruments administered at the end of the semester to assess the effectiveness of the online learning environment should ensure the accuracy of our results. These are discussed in section 6.1 below.

In order to accurately assess the computer skills of enrolled students, an e-learning skills self-assessment form (FutureU, 2007) was distributed at the outset of the course in order to arrive at a clearer picture of their degree of readiness for an online course. The form is divided into 6 basic components or sections; technology access, technology relationship skills, motivation, online video/audio, internet discussions, and success factors. Students were asked to calculate their average response for each section using a scoring and interpretation worksheet. Results of scoring revealed that all six students rated themselves as high on all six sections (5 on a scale of 5). In other words, this initial readiness survey pointed to high confidence in their technical abilities, even though they had no prior experience with online courses.

6. Course content

As Barnbrook (1996) explains, in the initial analysis of any project using computers the following question needs to be considered: "Is the data needed for the project already available in computer-readable form?" (p.3). Although a large body of course materials could be collected fairly easily from the internet, instructors need to tailor course content to meet the needs of their students and this requires that they develop their own e-lectures using a teaching software like *LessonBuilder*, for example, which allows the creation of interactive web lessons for the e-learning classroom. This could involve significant extra work. More problematic is the need to carefully select the content/data that would be best for the course. This is not as simple or straightforward as it may seem to be. Before this difficulty can be overcome, instructors need to make sure that they understand exactly what they want from the course; i.e., they need to have fully conceptualized the specific aims of their course and to use these aims in their selection of content. The final collection of computer-readable files selected on the basis of course objectives can be referred to as a *course corpus* to distinguish it from a more random collection of electronic course files. Whatever the course objectives are, it is important to ensure that the corpus will be capable of fulfilling them. The following sections of the paper describe the main factors that need to be considered in designing a course corpus.

7. Problems of using Moodle

One of the basic problems encountered by instructors wishing to use a blended method of delivery has to do with financial barriers. Although *Moodle* itself is an

open-source freely available software, it is not without financial burden. First of all, *Moodle* must be hosted by an outside source such as *FutureU*, so it is not really free. However, if your school is capable of incorporating such an environment, then your entire class can be internet-based. Secondly, there is a financial burden imposed on students in that they will need their own fairly new laptops with an internet connection, enough RAM, and adequate software (such as *Microsoft Word*, *OpenOffice*, and *Adobe Acrobat*). Without adequate access to the technology required in an online course, completing course assignments and engaging with other learners in the course can be challenging since most of the interactions that students will have with their facilitator and peers will be through Internet discussions (email, asynchronous discussion boards, and synchronous chats). Most important of all, since this course involves downloading and testing a fairly large number of linguistic software programs; high-speed internet connection becomes a must rather than a luxury, and this too can be costly.

Another major problem has to do with technical support. Web software can be complicated, and any online course can encounter a number of technical problems. It is important for instructors to know how to use whatever technology they will be using in the class, and to be ready to troubleshoot. If the instructor is not an expert and does not have an experienced staff to offer immediate software and hardware help in such cases, this can lead to huge disappointment. Of course *Moodle* offers fast, accurate, and confidential help with all aspects of using the web software. It is also important to note that students must be encouraged to collaborate and to offer each other the technical support required to complete the more difficult tasks such as downloading and testing software. Some students are more technically adept than others and should be prompted to take leadership roles in terms of technical solutions and guidance. Installation of *Moodle* can also be problematic. Although it is easier to install than most other web applications, if you are not familiar with Unix and other web technology, any installation can seem daunting. If you have your own server already, then you can ask a *Moodle* partner to install it for you. If not, however, *Moodle* does provide hosting services, where the software is installed and maintained in a fully serviced and secure environment.

Finally, instructors need to make sure they have internet connections in the classrooms allocated for the course so that they can access course space and students are able to complete their online assignments during face-to-face sessions. Instructors

can overcome any problems of classroom connectivity by using external USB devices that provide high-speed connections from any location. However, that can be an added financial burden.

8. Specific aims of the course

L&C is designed to provide a practical introduction to recent developments in linguistic computing, explaining many different facets of the interaction between computers and linguistics. In its approach, the course ranges from basic downloading of linguistic software and training skills to knowledge overview of whole sub-disciplines such as CL and Natural Language Processing (NLP). This approach offers a range of linguistically relevant computational information intended to address the need to provide systematic explanations of new topics, to evaluate linguistic software, and to investigate the effect that computational technology is having on the evolution of the field of linguistics. Other courses dealing with L&C tend to be designed specifically for the computer scientist, i.e. they are geared to programming rather than linguistics. To my knowledge, no one is developing an online course that addresses the needs of the ordinary working linguist's by providing them with a practical introduction to the computer analysis of language as well as the software for doing field linguistics and the online linguistic resources that complement them. The specific objectives of this course are thus as follows:

- To provide an introduction to CL including major concepts such as Natural language processing (NLP), artificial intelligence (AI), machine translation (MT), parsing & tagging, corpus-based linguistics, corpus annotation, speech synthesis, semantic representation, information extraction, semantic disambiguation, and relational logic (RL).
- To provide a glossary of technical terms in CL.
- To distinguish between CL and the use of computers in linguistics.
- To train students in the downloading and testing of different types of linguistic software (general-purpose versus domain-specific) such as frequency lists, concordances, collocation analysis, taggers & parsers, speech synthesizers, teaching software, and computer-aided translation (CAT)
- To familiarize students with online linguistic resources (general-purpose versus domain-specific), including online books, databases, URLs and audio-visual resources.

- To introduce students to case studies of computer applications.

In addition to the above linguistic aims, the course also fostered the good practices of collaboration and self-learning that are closely associated with online courses.

Each of the above aims was closely aligned to the various technology resources and activities offered by *Moodle* through the creation of content-related lessons and assignments. The main point to remember here is that lessons, as Schuemann (2005) advises, must be created based on 'sound pedagogy' (p.1) not technology. The *Moodle* environment includes a platform for several technology features, including class schedule, assignments, participant profiles, chats, wikis, an interactive glossary, e-mail, lessons that the teacher can create, quizzes, surveys, and workshops. Chats, forums, wikis, and workshops enable students to work collaboratively by replying to a discussion on the forum, for example, or chatting with a classmate about a project, or brainstorming in a wiki. As this article will attempt to demonstrate, incorporating the technology offered by *Moodle* lends itself to creating a collaborative project-oriented classroom. According to Moss and Van Duzer (1998), project-based learning is "an instructional approach that contextualizes learning by presenting learners with problems to solve or products to develop" (p.1). Indeed, one of the most eminent advantages of *Moodle* is that it facilitates this collaborative on-line environment, where knowledge is constructed through students involved in decision-making, planning processes, and working together toward a common goal. In this case, the goal was to create a collaborative content-specific website using *Moodle's* Wiki, a resource that allows users to create, edit, and link web pages easily, and to publish the finished product in *Wikipedia*. In order to further promote collaboration and self-learning, very little formal instruction was offered to students. Instead the instructor assumed the role of a facilitator encouraging students to construct knowledge and to find out answers for themselves by actively participating in the course forums, registering in webinars, and joining specialized online forums and technical support groups.

9. Structure of the course: Alignment of aims, content, and technology

As a first step, a set of specific objectives were devised based on the general aims of the course. Based on these aims, course material was assembled and divided into

components. The appropriate features of technology were then selected and interactive assignments were created to enhance aims and to help students construct knowledge. To help achieve cohesion between all three components, a mapping strategy (*FutureU, 2007*) was implemented. This involves drawing a picture of the course website itself. It might look something like an organizational chart, showing all the pages and their connections or a simple ‘backbone’ diagram:

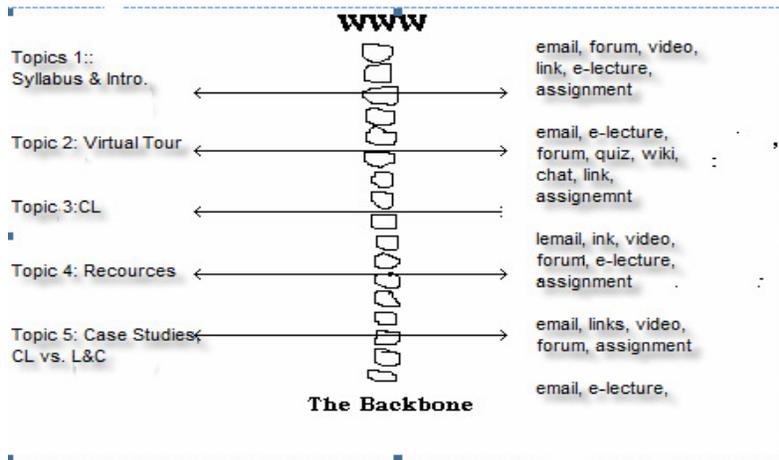


Figure 1. Backbone map of L&C

As the above diagram illustrates, the course is divided or chunked into five basic topics: course syllabus and introduction to L&C, virtual tour, CL, online linguistic resources, and case studies. Each topic contains a number of components which are linked either externally to content-related material in other websites or internally to course files and e-lectures. Each component also contains a number of technology features. One common technology found in all topics is the forum since this is the key communicative device, and it is within these interactive online spaces where most of the construction of knowledge occurs.

10. The Moodle front page

For the reader's convenience, this section describes the basic features of *Moodle*. All explanatory material and examples mentioned here are taken from Cole and Foster (2007). The *Moodle* homepage looks just like a website. There are links to the course calendar, online syllabus, weekly topics, assignment descriptions, discussion forums,

and so on. The forums also allow students to attach files for others to share. These online discussions are asynchronous so that students can enter and leave the discussion at whatever time they choose. Students are able to jump around from one section/topic (or week) to the next so they will always be able to find information they may have missed. The course homepage is broken down into course sections. The instructor has the option to divide the course by topics or by weeks. A course is created by adding resources and activities. The example below shows the editing mode of a new course being set up with topic sections. There are a few of Moodle's many blocks on the right and left sides of the topics, such as 'Latest news' or 'Administration'. The teacher is now ready to add resources and activities or a few new blocks to their brand new course.

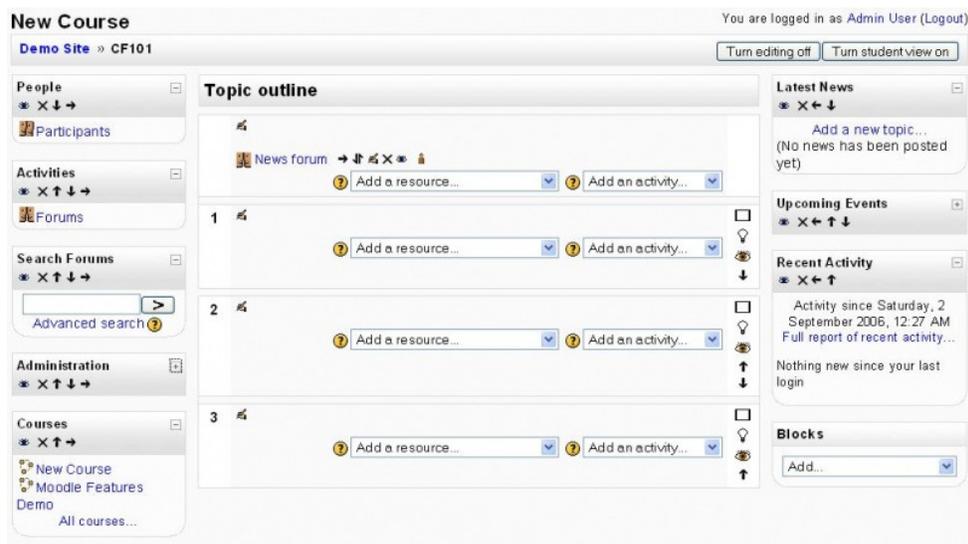


Figure 2. Moodle Homepage

Each course homepage generally contains blocks on the left and right with the centre column containing the course content. Blocks may be added, hidden, deleted, and moved up, down, and left/right when editing is turned on. Examples of blocks can be seen in the image above. 'Latest news', 'Blogs', 'Upcoming events', and 'Recent activity' are a few examples. There are a number of interactive learning activity modules that may be added to the course:

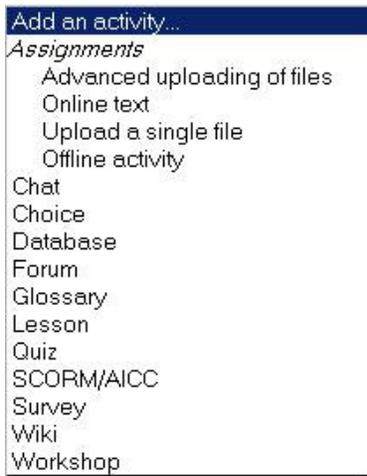


Figure 3. Moodle activity menu

Moodle supports a range of different resource types that allow you to include almost any kind of digital content into courses. These can be added by using the 'add a resource' dropdown box when editing is turned on.

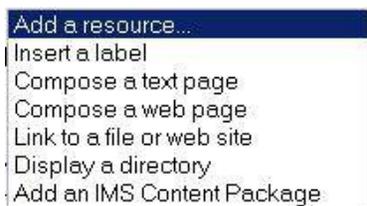


Figure 4. Moodle resource menu

The following features were used in the course:

1. Electronic assignment submissions
2. Self-assessment quizzes and online testing
3. Embedded ShockWave Flash (swf) files
4. Tracked specific student activity
5. Glossary
6. Survey
7. Discussion forums
8. Links to external websites
9. Chats
10. Powerpoint (pdf files)

11. Incorporated *LessonBuilder*

12. Wiki

11. Course topics

11.1 Topics one and two: Introduction and virtual tour

Each of the five topics of the course focused on a different aspect of the interaction of computers and linguistics. The topics were arranged roughly in the order of increasing specialization. The first topic was thus a general introduction to the syllabus and the required readings which included two textbooks: Lawler & Dry's *Using computers in linguistics: A practical guide* (1998), and Barnbrook's *Language and computers: A practical introduction to the computer analysis of language* (1996). Both textbooks have online versions with helpful navigation tools that can facilitate the reading and comprehension process. As a so-called *focusing event* (something to get the learner's attention such as verbal instructions, explanation of a graphic image, or viewing of an audio or video clip), the students were instructed to watch a popular online video by Michael Wesch, *The Machine is Us/ing Us* hosted on *YouTube* dealing with the effects of Web 2.0 on human consciousness and culture. They were asked to post their comments and responses in the forum. This was meant to function not only as an ice-breaker but also as an introduction to the challenges of online learning and to the importance of *YouTube* to the academic community.

The second topic was more linguistically oriented. Students were instructed to take a virtual tour of the course by clicking on a *LessonBuilder* document. This online fieldtrip trained students to download important linguistic software (IPA fonts, Toolbox, Pratt) and to evaluate general linguistics websites (*LinguistList*, *Summer Institute of Linguistics* (SIL), and *Linguistic Abstracts Online*) by having them tour various URLs essential to the course and complete a set of tasks or answer questions related to each stop. A forum was created where students could interact and help each other complete more difficult assignments. The advantage of including a virtual tour was that it functioned as a focusing event that motivated students to learn and helped create a bond between participants similar to that created in the real world between students on a field-trip. For example, the first stop on the tour, where students had to first download IPA fonts and post a message in the forum using these fonts generated enormous activity in the forum where students were scrambling to help each other

complete the task. Their satisfaction in finally sending the message was clearly exhibited in their postings.

11.2 Topic three: CL

The third topic was an introduction to CL and Natural Language Processing (NLP), a daunting area which is as much a part of computer science as linguistics. As Lawler (1998:6) explains, this is *terra incognita* for many linguists, even those who regularly use computers. To guide the students in learning more about this subject, a hypertext e-lecture was incorporated using *LessonBuilder*, which is a teaching software that allows the creation of interactive multimedia lessons. Students were encouraged to learn more about the software by registering on the site, Webinars, and then constructing their own lesson for the class. In addition, the glossary resource in *Moodle* was mobilized to create a working space where students could post their definitions of key terms and share them with their peers. A list of network resources was also posted to guide students in learning more about the field. Students were assigned chapters from the two required textbooks that cover all the major components of computing and linguistics (CL, machine translation, natural language processing, and artificial intelligence) and the software for doing field linguistics (frequency list, concordance, collocation analysis, lemmatization, tagging, parsing, corpus annotation, speech recognition, style checking, and computer-assisted language learning). Each student was asked to make two *PowerPoint* or *LessonBuilder* presentations to the class during face-to-face sessions: one theoretical and the other practical involved testing and evaluating their assigned software. They were given the opportunity to collaborate on the criteria that should be used to judge software for linguistic use. Searching online, they finally decided to use a software evaluation checklist based on a rubric developed by Miller and Bach (2001) available online at <http://www.SASinSchool.com>. Also included in this section was an online quiz on CL using *Moodle's* "Hot Potatoes" feature, a software package that allows the creation of a wide variety of interactive activities, including crossword puzzles and matching games.

11.3 Topic four: Web resources and wikis

Topic four was geared to linguistic video resources and more specialized online resources that address core linguistic domains such as phonetics, morphology, syntax,

and semantics. Two basic assignments were posted in this section of the course. First, students were required to choose a movie from the *Linguistic Society of America Video Archive (LSA)*, a storehouse of video clips dealing with a variety of linguistic topics such as child language acquisition, language variation, grammar, and semantics. They were then asked to post their evaluation of how effective the video was, and what kind of linguistic material they might include in a movie of their own making. They were encouraged to contemplate creating their own content-related video and to upload it to LSA or *YouTube*. In their second assignment students were required to choose a discipline from the list of core linguistics domains and to complete the online exercises related to it. Students were also asked to make their own list of the most useful linguistic resources and to compare their results in the forum.

11.4 The wiki project

The Wiki activity was introduced in the fourth section of the course and students were asked to choose a content-related topic from *Wikipedia* that needs elaboration (i.e., a *stub*), and then to create the first page of the wiki. To help them master the concept of wikis, they were referred to general information conveniently accessible through *Moodle's* help button, and to a popular video in *YouTube* entitled *Wikis in plain English*. As an added resource, a chat was created to discuss the progress of the Wiki project, the appropriateness of the material, and the best ways of organizing and linking the assembled information. The topic students finally chose for the assignment was *lemmatization*, a newly introduced term that refers to the process of producing a list which groups together all the related inflectional forms belonging to a *lemma*. Students constructed a plan for the first page of the project and then continued editing and stacking their work until the end of the semester when it was due to be uploaded to the *Wikipedia* site. At no time did the instructor interfere in this editing process, and because of the collaborative nature of the assignment, students quickly learned to accept revisions of their work by their peers. No doubt, this activity was the most challenging to students since it required them to "inter-relate information and to examine it from different perspectives rather than just to process ideas in a linear fashion" (Rogers 1998:6). Welsh's Web 2.0 video on the nonlinearity of texts should have already oriented them to this process.

11.5 Topic five: Case studies & comparison of courses

Topic five introduced case studies retrieved from the online journal *Computers & Texts* that provide detailed examples of research using various language analysis tools. Assignments in this section of the course included electronic submission of short evaluations of any one case study, and a text-retrieval assignment where students had to compare the different strengths of search engines (*AltaVista*, *Google*, *Excite*, and *DogPile*) using content-related queries such as *computational linguistics* and *natural language processing*. Included in this section of the course was a video developed by *FutureU* dealing with *chunking* and *linking*, two principles that are important in the construction of websites and in the effective communication of information. Students were asked to write a short two-page evaluation of the video, an exercise that was meant to help them with their wiki project where they would have to construct a hypertext webpage.

This last topic of the course was meant to be more specific and thus it was closely aligned to the course objective of distinguishing between CL and the use of computers in linguistics. For this purpose, a *PowerPoint* file of Markus Dickinson's course L&C (*Ling 261*) was included. Since this course is clearly geared to computer science, the students were required to provide a comparative analysis between this programming course and their own more linguistically oriented one. It is important to note that Dickinson's *PowerPoint* presentation was shown to students earlier in the course during face-to-face sessions. At that time, most of the concepts sounded alien to students and far removed from their linguistic discipline. Significantly enough, students were now able not only to fully comprehend the concepts introduced in Dickinson's document but also to critique them. Their written reports reflected their computational maturity and their growing awareness of the interrelatedness of both disciplines.

In order to measure the degree of comprehension, three instruments were used:

1. An on-line quiz developed for the purpose of assessing how well students have understood material on CL, such as artificial intelligence, tagging and parsing, speech recognition and speech synthesis, terminal nodes and non-terminal nodes, top-down and bottom-up parsing, and corpus analysis. Using Moodle's built in functions which allow making different types of quizzes, a quiz was created consisting of 30 questions ranging from multiple choice, true/false, and matching questions. In addition, a timer was used, setting a strict time limit.

2. An in-class face-to-face essay exam in which students were asked to
 - a. provide a comparison between this course and the one offered by Dickenson,
 - b. provide short definitions of major concepts that are integral to both L&C and CL,
 - c. Identify concepts that they viewed as problematic upon their first viewing of Dickenson's presentations and provide short definitions of these concepts, and
 - d. a short essay question that allowed students to discuss the implications of the course content for their own professional and personal learning experiences.
3. A take-home exam that tests comprehension, taken from a set of 6 questions developed by Klavans (2001). These questions were used because of the strong application skills that they entailed. In order to demonstrate the kind of practical and theoretical skills this exam entails, the first two questions are provided here:

1. What kinds of problems might a computer have with these sentences?
 1. Sue bought red apples and plums.
 2. It was a large animal house.
 3. Susan baked in the kitchen
 4. Susan baked in the sun
 5. Susan baked...
2. What are the main uses of a text-to-speech system? What information does the computer need to know in order to pronounce these sentences in informal style?
 - a. What are you doing tonight?
 - b. The woman was delighted.
 - c. That article misled me.
 - d. That's a new car, isn't it?
 - e. That was a tough test, although I did well
 - f. Can't you sing better?

Students scored high on all three instruments (90% and over) which substantiates their comprehension and indicates mastery of the major concepts integral to L&C, CL, and their ability to reason critically about advanced topics and synthesize their own ideas. The final two instruments discussed below will attempt to reveal the role that *Moodle* plays in the enhancement of skills.

12. Quality of online learning environment: SSS & COLLES

In an attempt to evaluate the success of this blended course in achieving its objectives, two instruments were administered at the end of the semester. A student satisfaction survey (SSS) was developed for the occasion which involved getting student feedback on the effectiveness of the Moodle environment and the basic components of the course. It was arranged into 7 scales that tested whether or not:

1. Moodle enhanced instruction;
2. on-line activities were effective learning tools (i.e., wiki project, forums, chats, quizzes, assignments);
3. online course enhanced learning (i.e., computer skills, computational skills, linguistic skills, software usage, and evaluation skills);
4. technical assistance was adequate;
5. technology-based activities developed computational skills (i.e., downloading of software, training in software, and evaluating software);
6. Instructional materials were well-organized; and
7. web-based resources were effective learning tools (i.e., linguistic websites, e-lectures, and YouTube videos). The SSS survey is designed as a five-point scale that ranges in response from 'almost always' to 'almost never'.

The second tool used to measure the effectiveness of the course is Moodle's built-in survey which, according to Cole & Foster (2007:209), has been proven an effective instrument for analyzing online courses. The Constructivist On-Line Learning Environment (COLLES) was designed to help access key questions about the quality of an online learning environment from a social constructivist perspective (Taylor & Maor, 2000). As Dougiamas & Taylor (2002) explain, the instrument consists of 24 questions arranged into six scales:

3. **Relevance** - how relevant is online learning to students' professional practices?
4. **Reflection** - does on-line learning stimulate students' critical reflective thinking?

Comment [HP3]: The numbering and indentation appeared strange on my screen so I had to reformat the style. Hope this is what you wanted.

5. **Interactivity** - to what extent do students engage online in rich educative dialogue?
6. **Tutor Support** - how well do tutors enable students to participate in online learning?
7. **Peer Support** - do fellow students provide sensitive and encouraging support?
8. **Interpretation** - do students and tutors make good sense of each other's communications?

The scores of the SSS and COLLES surveys were high (90% and above) on all scales suggesting the effectiveness of the online learning environment and its positive impact on the acquisition of skills. In the final analysis, the course was judged to be successful in achieving the learning goals originally set. This assessment was based not only on the responses to the surveys, but also on statements made in forums, essays, exams, and in-class feedback. It is important to note that the six students generated a large amount of data during the 14-week course. Apart from the survey data, about 150,000 words were written in the online forums and about 15,000 log entries were recorded. Both the SSS and COLLES scores also revealed that all students experienced an optimal learning environment on all scales, and our experience in the face-to-face sessions seemed to confirm this. Especially significant were the high scores of the COLLES relevance scale. As Cole & Foster (2007) explain, close attention must be paid to the relevant scores since student perception of course relevance is very important in determining student satisfaction and learning. "If a student believes a course isn't relevant to her life, she will have difficulty spending the time required to be successful. Her performance will suffer, and her perception of the value of the course will diminish" (Cole & Foster, 2007:210). It is worthy of note that all six students were given excellent individual assessments.

13. Conclusion

It is hoped that this study has provided linguists with the necessary means to construct well-structured online courses in which there is cohesion between objectives, content, and technology. Teaching is indeed a complex multi-layered endeavor and this study has attempted not only to explore ways of using technology as a teaching assistant,

but also to explore ways of integrating the computer analysis of language into mainstream linguistic coursework. The results of this study have important ramifications for students of linguistics in terms of professional development. A basic premise of this study is that the integration of L&C into the linguistic curriculum would enable students of linguistics not only to use popular software tools for research, but more importantly to become competitive in today's labor market which is dominated by the field of information technology. There are many successful commercial applications of language processing on the market and linguists with adequate computational skills are much in demand, especially in the field of speech pathology where there is a growing need to increase the efficiency of software tools that address the needs of the learning disabled. It is hoped that the integration of this course into the linguistics curriculum would provide students with the opportunity to tap their potential and enter a domain which has for too long been dominated by computer scientists. No doubt, a good background in L&C will allow the new specialists in linguistics to work productively in an interdisciplinary team, and it will hopefully guide them to new ideas and approaches.

It is also hoped that L&C will become recognized as a standard first step in the linguistics curriculum. As software tools for linguistic analysis improve, instructors will integrate them more deeply and broadly into their subsequent courses. Further research should provide us with other features of CL that can be integrated into the electronic syllabus design of L&C such as sense disambiguation, machine translation, information retrieval and extraction, and speech processing or automatic speech recognition (ASR). The way forward would seem to be by a double movement, namely to ensure the widespread integration of L&C into the linguistic curriculum so that results can be triangulated and cross-checked, and on the other hand, with the increasing availability of software tools for linguistic analysis, to ensure that a wider variety of these tools are integrated into the syllabus design while providing vigorous discussion not only about their successes and shortcomings, but also the formal linguistic theories upon which they are based.

We conclude this study by offering practical advice to instructors who may be considering a change in methods of delivery or platforms. As summarized by Grimes and Whitmyer (2006), these are the eight steps to follow for online readiness:

1. Gather and organize your existing course materials.

2. Decide how best to deliver your course materials and resources.
3. Locate and collect any additional materials you wish to add because of the multimedia capabilities of the online classroom.
4. Decide on the "Chunks" and "Links".
5. Draw a map of your course structure.
6. Choose authoring software to convert your course materials to Web pages.
7. Convert the course materials you intend to deliver online into computer file formats that will provide the easiest online access.
8. Post your Internet ready files to the course Web site.

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**A Socio-cognitive Modeling Approach to Teaching
English Argumentation**

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Abstract

Argumentative writing is an important literary activity underlying various writing tasks across all disciplines. To write effective English argumentation requires mastering analytical and evaluative skills. These English rhetorical expectations run counter to the educational practices emphasizing group harmony and conformity. However, few studies have addressed the pedagogical needs of developing explicit instructional approaches to foster argumentation skills for L2 writers. Accordingly, how to teach L2 students a thinking process for achieving well-formed argumentation motivates the present study. This study introduces a socio-cognitive modeling approach, which has been used successfully with English freshmen in an EFL composition course. Results indicate that student essays exhibited significant pre- to post-test gains in specific argumentative features. Participant responses to the evaluation questionnaire on the usefulness of this approach also reflected the same findings as in the textual analysis. These findings illustrate that this socio-cognitive approach can facilitate the composing of effective English arguments by EFL learners.

Key words: argumentative writing, EFL writing, English argumentation

1. Introduction

Argumentative writing is an important literary activity underlying various writing tasks across all disciplines. Academic writing tasks such as essays, term papers, critiques, and theses require more than merely collecting facts and summarizing information. Students are expected to analyze competing knowledge claims to voice their own perspectives. These English rhetorical expectations run counter to the educational or social practices, emphasizing group harmony and conformity. At issue is how teachers should assist students from non-English cultural backgrounds. Few studies have addressed the pedagogical needs of developing explicit instructional approaches that will foster argumentation skills for L2 writers. The present study intends to bridge this gap by incorporating social views of writing into the cognitive-based process approach. Although various researchers have advanced a ‘post-process’ approach to second language writing contexts in response to the limitations of a process approach (Atkinson, 2003; Hyland, 2003; Casanave, 2003; & Matsuda, 2003), to date no empirical study has attempted to develop instructional practices based on these suggestions.

Developments in composition research in the last two decades suggest that a socio-cognitive approach to writing holds promise for improving argumentation skills for second language writers. A socio-cognitive approach rests on two theoretical views of writing: the cognitive and social view of writing. From a cognitive perspective, writing is represented as a problem-solving process, shaped by the ways the writer interprets the rhetorical problem posed by the writer’s purpose, the reader’s needs, the exigency of the situation, the goals they set, and the strategies they control to solve their identified problem (Flower & Hayes, 1981). As a social process, task interpretation, goal setting, and juggling of multiple demands must take into account the discourse practices in which the writing is situated. In this study, grounded within these two perspectives, writing is defined as a problem-solving behavior in a situated context.

How these two theoretical perspectives shaped the current approach to teaching English argumentative writing is explained below.

A feature of the cognitive model that is relevant to the present approach is ‘thinking strategies’ required in the composition process. These ‘thinking strategies’

constitute a certain habit of mind, resulting in the features manifested in final written products. To provide cognitive modeling in writing instruction, the present approach involves “demonstrating and practicing the kinds of thinking processes that experienced writers use so that students can become aware of, and can practice, the complex mental activities that characterize expert composing” (Cumming, 1995, p. 383).

Nevertheless, while writing is a mental activity, it is not an autonomous mental process without reference to social context. Social norms, roles, relationships, status, and other social factors are assumed to place certain constraints on the function and uses of writing in a particular setting. That is, writing always serves certain social functions and there are conventional practices in each culture to enact these social actions. This highlights the importance of familiarizing students with the social context requiring a specific genre across cultures. During the late 1980s, theorists employed the notion of genre to describe the socially standard rhetorical strategy for addressing a type of situation (Coe & Freedman, 1998; Hyland, 2004 & 2007; Hyon, 1996; Swales, 1990; & Tardy, 2006). Genre is considered “socially authorized ways of communication” (Hyland, 2004, p.37). To provide instructional scaffolding on the social aspect of writing, instructional focus in the present approach includes identifying the various social purposes to be achieved in a specific genre, argumentative writing, and understanding the ways of using language patterns to fulfill these purposes.

To incorporate the social dimension of writing into the cognitive-based instructional approach, rhetorical thinking involved in constructing a specific genre ‘argumentation’ constitutes the primary focus in this paper. These thinking processes that experienced writers employ to compose effective argumentation across disciplines and working settings are typically manifested in Toulmin’s (1958) model of argumentation and one of the classical rhetorical theories, stasis theory. As such, these two theories, Toulmin's model and stasis theory are adapted into two prewriting heuristics: argument heuristics and issue heuristics, and are briefly explained below. Notice that these two theories should be considered more than a formula for naming various argumentative elements, as contended by Lunsford (2002). Rather, these two theories are construed in the present study as indexing a way of thinking, leading to effective argumentative texts.

In the next section, I briefly introduce these two theories and describe the major goals and instructional strategies of this paper.

1.1 Toulmin's model

Toulmin's (1958) model includes six interrelated elements: a claim is the writer's position to the controversial issue; 'data' means the facts or the premise we draw upon as the basis for the claim (p.97); a warrant refers to a 'hypothetical' statement that bridges the data and claim (p.98); 'backing' is a general statement used to support the warrant (pp.103-107); 'qualifier' refers to a word such as 'necessarily', 'probably', and 'strongly' which modifies the strength of the claim and data; and 'reservation' is the circumstances that can defeat the claim (p.101). The schematic presentation in Figure 1 represents the full six-part Toulmin analysis.

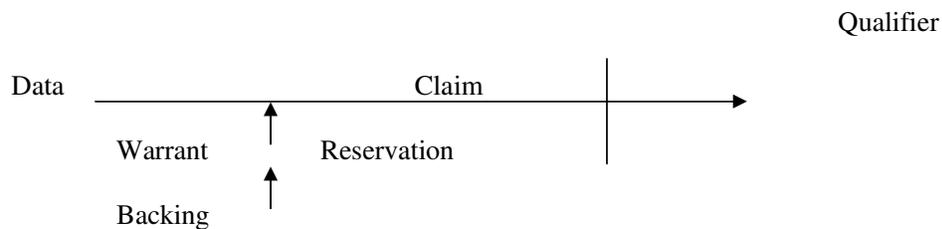


Figure 1. Toulmin's model with all elements displayed

Toulmin's model has been considered as characterizing a fundamental organizational structure across academic disciplines (Fulkerson, 1996; Lunsford, 2002; Ramage, Bean, & Johnson, 2001). Although various composition textbooks have adapted Toulmin's model to teach the generation of argumentation (e.g., Lunsford & Ruszkiewicz, 2001; Ramage, et al., 2001; Rottenberg, 1994), only three empirical studies have adapted Toulmin's model to design instructional programs and examined its effect on elementary, middle school and high school students in English L1 contexts (Knudson, 1992; Lunsford, 2002; Yeh, 1998a). Nevertheless, no study has adapted Toulmin's model in an L2 writing context. As such, these six elements are taught to the EFL college students in the present study as argument heuristics.

1.2 Stasis theory

Another pre-writing heuristic, issue heuristics, was developed based on one classical rhetorical theory, stasis theory. This theory emphasizes that it is necessary to identify

the major controversial points in each argumentation occasion in order to strengthen an argument (Crowley & Hawhee, 1999). According to this theory, there are five types of controversial points in each argumentation issue: fact, definition, cause, value, and proposal (Ramage, et al., 2001). That is, we can examine each controversial issue from five different perspectives and teach students to do so for the purpose of defending their claims and elaborating on their arguments.

Based upon Ramage et al., (2001), a *fact argument* arises from disagreements about the existence or nonexistence of a given condition or phenomenon. A *definition argument* occurs under the condition that before people can argue whether a given thing belongs to a category or not, that category itself needs further definition first. A *cause argument* occurs when people disagree about the cause of an event or a trend. In these arguments, people question the way things are, were, or will be; they disagree about the nature of reality. In contrast, *value and proposal arguments* deal with values; what people consider important, good, or worth doing. By learning to examine an argumentative issue from these varied angles, students are expected to develop their reasons based on the potential controversies with regard to an issue.

Although several composition textbooks have employed stasis theory or modifications of this theory to teach students the analysis of argumentation (e.g., Crowley & Hawhee, 1999; Fulkerson, 1996; & Rottenberg, 1994), only Yeh (1998a) has examined its effect on teaching argumentation to English L1 middle school students. In order to fit the developmental level of middle school students, Yeh (1998a) simplified this theory into three types of controversies and concluded that it benefited middle school students in the U.S. to generate reasons to support their claim. In the present study, the five types of controversial points were taught to EFL college students as issue heuristics since college students are assumed to be developmentally ready to understand and apply this theory into their argumentative texts.

1.3 A socio-cognitive approach

I integrated the above theories to develop a socio-cognitive approach to teach English argumentation. In this approach, students are trained to compose argumentation through three different stages of critical inquiry. In stage one of this approach, students discuss the key aspects of the writing context: writer's role and communicative intent, reader's role and intent, channel of message, and social activity.

This contextual awareness is considered essential for students to understand how the writing context shapes how a writer interprets task demands and influences what a writer writes. The next step is to teach the types of thinking that experienced writers use as they prepare an argumentative text. To teach these thinking strategies, I devised two heuristics adapted from the models employed in Lunsford (2002) and Yeh (1998a): Issue heuristics (based upon stasis theory) and argument heuristics (based upon Toulmin's model; see Appendix A for an example). Finally, stage three focuses students' mind on revising their texts with regard to audience concern and language use. Audience accommodation is designed as part of the focused revision activity in this approach because the consideration of audience is critical to effective persuasive writing (Fontaine, 1988; Rafoth, 1985; Roen & Willey, 1988). The specific implementation strategies of this approach are detailed in the Method section.

As such, the purpose of the present study is to determine to what extent this socio-cognitive approach can help L2 students write effectively in an English argumentative genre. Specifically, this study addresses the following research questions: (a) How did this approach affect the quality of EFL college students' written texts, with regards to several argumentative features? (b) How did participants assess the usefulness of this approach?

2. Method

To explore the effects of this approach, the present study employed a quasi-experimental design with the same participants receiving pre- and post-test treatments. There is no control group since it is hard to find a comparable group of participants.

2.1 Participants

Participants were 22 English-major freshmen in the composition course taught by the researcher in Taiwan. This composition course lasts for one academic year and meets two hours each week. Prior to this pedagogical intervention, all participants had received one semester of formal English writing instruction. The present study was conducted in the second semester of their first college year. These novice writers were selected since less proficient L2 writers have received little attention in previous EAP/ESP studies.

2.2 Writing task

To examine the effect of genre-based instruction, students were provided with different pre- and post-test writing tasks, which were counterbalanced. Half of the students wrote to topic 1 and half to topic 2 in the pre-test. In the post-test, students switched topic, writing to the topic they did not address in their pre-test essay. The topics students wrote to included:

1. Write a letter to your parents trying to persuade them for something you know they won't give to you--for example, a cosmetic surgery, a credit card, or a study trip to the U.S.
2. Write an essay in which you form an argument for what should be done in order to improve your learning by our university or by our department.

2.3 Pedagogical intervention

What follows is a description of ways to explore an argumentative issue and eventually develop a text through a sequence of activities that move students through three different stages of critical inquiry.

2.3.1 Stage one: Understanding the writing context

At this stage, students were expected to distinguish text types related to argumentative genres and to recognize several contextual variables involved in generating argumentative texts.

Activity 1.1: Students were first introduced to the genre "argumentation" by considering several featured questions that focused their attention on contextual variables in writing.

- Where can you find the text?
- What purpose does it serve?
- Who is the writer? What are the writer's qualifications for writing the text?
- What's the writer's purpose?
- Who are the readers? What are their concerns? What is their purpose?

Students were asked to infer the process that experienced writers engage in while producing argumentation and to respond to the above questions while reading an argumentative text.

Activity 1.2: Students studied three texts of similar genres (drawn from different publications): an analytical argumentation, a hortatory argumentation, and a

discussion. The reason for choosing these three genres was because many students often misinterpret argumentation as discussion by juxtaposing pro and con arguments in their essays without formulating their own voice. Students analyzed each text based on the questions listed in activity 1.1.

2.3.2 Stage two: Constructing argumentation

The main goal of stage two was to introduce students to genre-specific rhetorical thoughts that enabled students to elaborate and strengthen their arguments.

Activity 2.1: The issue heuristics (see Figure 2) was primarily designed to prompt students to first identify the main issues as questions, which were considered critical to the development of their arguments in support of their claim. Students were taught to fill in their own writing purpose and their target audience's concern first in order to determine what was at stake between the writer and the intended audience. They were then encouraged to identify the focused issue for persuading the intended audience by first stating various issues (in a form of an issue question) with regard to fact, definition, value, cause, and proposal. Among these different issues, they needed to distinguish which one was the most critical issue and formulate major claims based on their response to that issue. In addition, the types of issue/claim listed in this activity could be used as supporting reasons for the writer's main claim for the next heuristics.

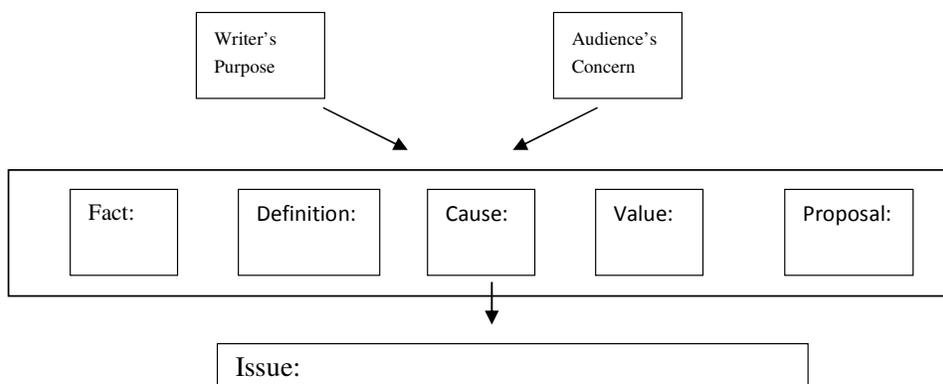


Figure 2. Issue heuristics

Activity 2.2: After students had utilized the above heuristics to develop their major claim, they were taught to pre-write their ideas in the chart as follows.

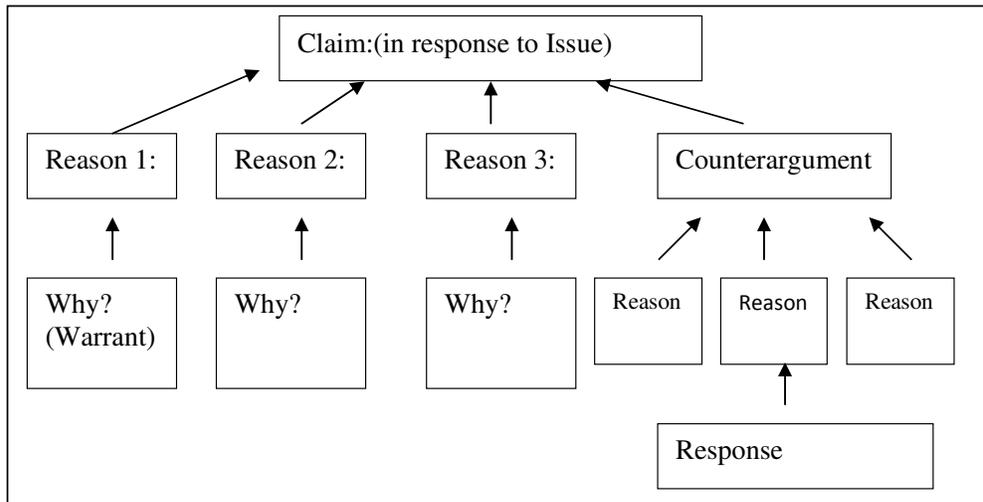


Figure 3: Argument heuristics

Every week students read pro and con arguments on a given topic, applied this heuristics to analyze the text, and wrote their own response or evaluations of the text based on their personal experiences. Over six weeks each student had read approximately six articles (one pro and one con opinion article for each topic). For their written responses, students were primarily encouraged to form their opinion and to give reasons for their opinions but they were not required to give elaborated and well-justified arguments. The goal of this reading and responding activity was to foster students' ability to evaluate their reasoning and to formulate their own voice among contradictory claims.

2.3.3 Stage three: Drafting and revising

At stage three, students were taught to revise their texts with regard to audience concerns and language usage.

Activity 3.1: Students were taught to distinguish the differences between audience-based and writer-based reasons (See Ramage, et al., 2001 for further reference). Then they were taught to explore their target readers' interests, questions,

values, fears, potential objections to the writer's claim, and shared features or beliefs between readers and writers.

Activity 3.2: Language issues dealt with at this stage included a variety of endorsing verbs, hedging, evaluative vocabulary, concrete expression, specific examples, and use of narrative.

2.4 Data Collection

The primary data consisted of pre- and post essays and student responses to a questionnaire asking students to evaluate this instructional approach.

The first set of data was composed of the pre- and posttest essays. Participants wrote their pretest essays before, and their posttest essays after the eight-week period of pedagogical intervention. Each of their essays was written in class for two hours and consisted of about 200-300 words. Note that to achieve control, the essays were composed only for research purposes without peer or teacher comments. To avoid biased data, other written assignments, one take-home argumentative essay and six reading-based writing tasks, are not included in the present study. The major reason is that these writing tasks were completed with input from peers and the teacher.

Another data set comprised students' course evaluation questionnaires (See Appendix B). Once participants had completed their posttest essays, they were asked to fill in a questionnaire with regards to the usefulness of this approach and their difficulties in learning these two heuristics. Most participants answered the questions in English.

2.5 Scoring rubric

Appendix C shows the assessment scheme used to score the quality of each argumentative feature in the pre- and post-test essays. Based on Connor's (1990) and Yeh's (1998b) analytical schemes, the researcher developed six-point rubrics for scoring the essays on five argumentative features: claim, reason, warrant, counterargument, and voice.

2.6 Data analysis

All essays were graded by the researcher using the six-point scoring rubrics. This analysis was validated through inter-rater analysis which involved the researcher analyzing the data at two different points in time. The time interval of 2 months in this case allowed the researcher some opportunities for clarifying any bias in the analytical process. The intra-rater correlation coefficient ranged from 0.91 to 0.97 for different argumentative features. Paired-samples *t*-tests were conducted to examine the development of writing ability on each argumentative feature.

Answers to the questionnaire about the effectiveness of this approach to learning English argumentative writing were coded with regards to the usefulness of this approach and students' learning problems. Within each dimension, several categories were further developed based on student answers. In terms of usefulness to learning, student comments primarily centered on exploring different viewpoints, multiple ways to develop reasons, and clarification of assumptions connecting their reason and claim. With regards to learning problems, comments were grouped into generating convincing reasons and identifying underlying assumptions.

3. Results and Discussion

3.1 Effects on written quality

The results of the approach implemented is reported here, though no hard conclusion regarding development of argumentative ability can be drawn because of the limited sample size, the particular genre used, and the special environment in which the research was conducted. As shown in Table 1, the paired-samples *t*-test indicated that students made statistically significant progress in all argumentative features examined, as evident in the difference between the scores in the pre- & posttest essays.

With respect to the use of claim, scores for the post-test essays were significantly higher than scores for the pre-test essays, $t(21) = 8.32, p < .001$. Regarding the quality of reason, scores for the post-test essays were significantly higher than scores for the pre-test essays, $t(21) = 7.18, p < .001$. In terms of warrant, scores for the post-test essays were significantly higher than scores for the pre-test essays, $t(21) = 4.17, p < .001$. With regard to the use of counterargument, scores for the post-test essays were significantly higher than scores for the pre-test essays, $t(21) = 10.34, p < .001$. Likewise, scores on voice for the post-test essays were significantly higher than scores for the pre-test essays, $t(21) = 9.13, p < .001$.

Table 1*Means & standard deviations for functional elements at pre-test and post-test essays*

Traits	Pretest		Posttest		Gain score	
	M	SD	M	SD	M	SD
Claim	1.15	0.37	3.60	1.31	2.45	1.32
Reason	1.70	0.66	3.75	1.41	2.05	1.28
Warrant	1.40	0.50	2.80	1.54	1.40	1.50
Counter-argument	1.30	0.47	3.50	1.00	2.20	0.95
Voice	2.25	0.44	3.80	0.83	1.55	0.76

It appears that improvement in the quality of written texts correlates highly with enhancement in participant awareness of discourse features in the taught genre. Generally speaking, student performance on the pre-test in all features was fairly poor. Except for voice, the average score is below two on a scale of six. This indicates most students failed to describe the importance of the issue, elaborate reasons, state underlying assumptions or generate counterarguments despite being able to give a clear and consistent claim. After the intervention, they made statistically significant improvements in all these features, particularly with regards to stating issue importance and counterargument. As shown in the gain score, students made the most progress on claim/issue, counterargument, and reason but the least progress on voice and warrant.

This improvement indicates students began to understand the importance of contextual factors, such as writing purpose and audience needs in constructing argumentation. This is evident in improvement in presenting the background problem of the controversial issue, which strengthens the importance of the issue.

Awareness of audience is also evident in development of more cogent and audience-based reasons in the post-test essays, as compared to writer-based reasons in the pre-test essays. Without the scaffold of issue heuristics, most students were either not capable of identifying what is at stake between the writer and the target readers or struggling with addressing the conflicts. As such, they often came up with irrelevant justifications or appealed to common-sense reasons. After the intervention, most made progressive changes in their strength of reasoning.

Moreover, as a result of cognitive modeling in a situated context and working through these mental strategies, students gained practice in the kind of thinking that enables them to do more than just stating a claim with supporting reasons. The majority of the participants in their first essays tended to make one-sided arguments, simply presenting their position on the issue without summarizing and responding to alternative viewpoints. Yet most were able to articulate potential objections in the post-test argumentative essays. This indicates students were able to strengthen their arguments by accommodating differing views on an issue. As emphasized in audience theory, identification of and response to opposing viewpoints is essential to effective argumentative/persuasive writing.

Less progress was made in terms of warrant as compared to other argumentative features. In English, the presence of warrants indicates the writer's ability to recognize the need to justify the link made between the data and the claim. This ability is difficult to acquire even for native-English speaking students. Connor (1990), Knudson (1992), and Crammond (1998) all confirmed that warrant is seldom employed in student writing across grade levels even for college students. This problem is further compounded in L2 writing. Previous cross-cultural studies have argued that Chinese-speaking students failed to link their support and claim in their argumentation (Becker, 1995; Hinkel, 1994). Thus, this aspect of argumentative skills may take more practice to develop.

This three-stage approach to teaching argumentation may allow teachers to reveal to students much of the thinking strategies that underlie the writing of pedagogical argumentative texts. The present findings are consistent with previous research teaching reasoning strategies of a given genre to students at various literacy levels (Kuhn & Udell, 2003; Dobson & Feak, 2001; Knudson, 1992; & Yeh, 1998a). These studies have shown that explicit modeling of reasoning required for a given genre can facilitate development of target skills. Note that the set of heuristics and questions introduced in this study cannot be offered as a template for thinking and arguing across all academic disciplines. Rather, the approach provides students with some useful strategies to deal with argumentative writing in their chosen disciplines.

3.2 One example

The qualitative analyses and results are illustrated next through one set of pre- and post-test essays selected as being representative of the data. The essays were written

by an average writer among the participant group in response to the pre-test prompt, Write a letter to your parents trying to persuade them for something you know they won't give to you, and to the post-test prompt, Write an essay in which you form an argument for what should be done in order to improve your learning by our university or by our department. This example shows how each argumentative feature was segmented and analyzed. To facilitate discussion, sentences are labeled according to the analytic scheme.

3.2.1 Pre-test

In the pre-test, the writer scored 2 for the features of claim, reason, warrant and counterargument and 3 for voice. This performance illustrates the typical achievement of the participants in the pre-test. The essay is reproduced with labeling in Extract 1.

Extract 1. Sample pre-test essay

My dear mother, recently, you have bought a new car, and I think you can give your used car to me (CLAIM). Certainly, I know you must have many questions to my requirement and consequently want to realize what my reasons are. Please be patient and take it serious to give me a chance that I will tell you my reasons and answer your doubts.

There are three basic reasons, first, I need the car to carry some people who you support me to help them carrying them for classes (REASON 1). Then, I need the car that will be truly helpful in carrying those people and their goods. I know I already have the motorbike, but the truth is motorbike's load is smaller than car (COUNTERARGUMENT/REFUTATION). And the capacity of people and goods are over my motorbike's load. For me, the car is certainly needed.

Besides, comparing with the train, the car for me is more controllable (REASON 2). More clearly, I was used to take the train between Chiayi and Taichung, and I must stick by the train table and follow the train's line. It always takes me much time to wait for train and I had no idea to deal with the late of the train. My time was limited by the train schedule, and it also affects my other work in my schedule. The train is not flexible and neither it can take me from any place to another. In fact, there are fixed stations for train to stop. Except the convenient, there is another point-time. If I can drive the car home, I truly can save much time comparing with the taking the train.

For the car, it cannot be without operating for a long time (REASON 3). Its equipments will be inert and also the function will be broken down. For me, I can have the car to let my life to be more convenient and also for the car, it can keep its function. The tools which people invented are to make people to be more convenient, then, now the car that I can drive and use to provide convenience to myself and the people around me. The benefit is double.

The essay received only 2 points for argumentative features: claim, reason, warrant, and counterargument. Although this writer has explicitly stated his claim, there is minimal introduction of the problem/issue. Without a clear introduction of the major problem at issue, readers may not be able to understand the purpose of the arguments and thus be unable to make sense of each proposed reason. Furthermore, throughout the essay the writer has been struggling with formulating effective and appealing reasons to support his claim. All his reasons are relevant but not important and well-developed. For instance, the reader can't resist asking why the following reasons are related to his need to own a car as a college student, "I need the car to carry some people who you support me to help them carrying them for classes (reason 1)" or "For the car, it cannot be without operating for a long time (reason 3)." This problem was compounded since there are few warrants presented to make strong connections between claim and reason. As such, there is a great idea jump between the stated reasons and the major claim, making the proposed reasons sounded less persuasive and appealing. In addition, the writer cited only one counterargument, "I know I already have the motorbike, but the truth is motorbike's load is smaller than car" but it wasn't followed up with further elaboration.

To generate more effective arguments, the writer needs to, first of all, lay out a clear argumentative background; that is, to explicitly state the conflict between writer and target reader. The writer then has to consider the reader's concern regarding this problem in order to propose more cogent reasons. For instance, he can re-formulate the third reason as more reader-based by stating how his parents can benefit from his use of the old car. Moreover, he needs to justify his proposed reasons by stating why his need to carry some people to classes is important. Moreover, the writer needs to include more of his mother's potential objections such as the necessity and safety of the writer's owning a car.

The essay received 3 points for voice because the writer employs little emotional language and personal experience to build up his credibility. To score higher on voice, he needed to employ more vivid language or examples to convey sincerity and evoke the reader's emotions.

3.2.2 Post-test

Analysis of the post-test essay showed that the writer used stronger reasons and developed more explicit and elaborated connections between reasons and claims compared to his pre-test essay. Overall, the student exhibited stronger voice by including more emotional and concrete language and built writer credibility through persuasive references to personal experience and careful consideration of counterarguments. The post-test example, reproduced in Extract 2, received 4 points for claim, reason, warrant, and counterargument and 5 points for voice.

Extract 2. Sample posttest essay

“ I can't believe it, I couldn't find any available The Red Chamber for my report and I need to go to NCCU to rent it! Kill me!” “My Goodness! Don't tell me study room doesn't have seat again. When will it have seat?” Those conversations happen in library every day, and certainly it is incomplete. Should library get priority of University's expenses? *I consider library should have University's expenses' priority for extending it to make study room bigger and to collect more books* (CLAIM).

First, study room isn't enough is the biggest downside of the library. Being a library in school, it basically needs to provide students with adequate study space. Take my campus of NCYU, Ming-shoung for instance; it has almost 2000 students but the library only has 50 or so seats in study room. Most of the time it has not seat, especially before big exams, it is always an annoying problem to struggle a seat in study room or worry about an ideal place to study. Besides students' inconvenience, study room isn't enough also brings horrible result; *when study room doesn't have plentiful seats to provide students with good study environment, they would be influenced by this irritating problem and couldn't do well in the tests, and the gliding grades will make out University's reputation worse* (REASON 1).

Maybe some people will question why don't students study in other places (COUNTERARGUMENT)? But I would ask: Where? Empty classroom? Don't tell me before big tests I need to go through a lot of red tape to rent a classroom. Dorm doom? We all know how noisy it is; not to mention memorize textbook context or concentrate in here. *I can't think of any other place more convenient than library, and the quiet, good quality study space is what we students need (REFUTATION).* But the fact is study room is lacking in seats, I think University should set up at least 200 seats in study room in library; and then the condition surely will be better than now.

The other big fatal wounded for our university library would be it lacks of various books. *Whenever a library doesn't have various books to provide students with their studying, it becomes their study burden and the learning effect is limited (WARRANT).* Last semester, I couldn't find the English novel appointed to study by the professor of English reading course; my classmate got fury when she was not able to rent a common book for her extended reading. I can't help but wonder: isn't this problem need to be face squarely? The distance between NCCU and our campus is 30 minutes by scooter in round-trip, not to mention the time we need to spend on searching the book after entering there. *Had our university's library has sufficient and various books, we wouldn't need to waste that much time; and we could save those time in learning efficiently (REASON 2).*

A library lacking of various books usually due to the shortage of expenses, so I think school should cut some unnecessary expenditure to buy more books (REFUTATION). The can't stand consequences of professors' complain about library, students' losing faith in it is the first and foremost problem school should pay attention to. After all, the entirety learning performance is what a University counts on.

The better a university's library is, the greater its students do in their academic. Library is not only one of the most important buildings in a university, but also the decisive element of students' study effect. Therefore, I sincere hope school to extend the original inferior library and higher its quality.

In the post-test, the writer argued strongly for improving library facilities and the size of the book collection. He proposed his claim through a clearly stated

background problem, indicating greater contextual awareness. Throughout the essay, he elaborated on his theme that the current library facilities cannot fulfill student needs and analyzed the negative effect on learning in great detail. His reasons are appealing since they cater to the reader's concern about student achievement. In addition, his focused, logically developed connections between reasons and claim strengthened his argument. He also took the opponent's viewpoint and built arguments by acknowledging and responding in a thoughtful way to the objections that the reader may advance, even though one counterargument is refuted but not explicitly stated (Paragraph 5 in Extract 2). Furthermore, this essay exhibits engaging voice through thoughtful consideration of the issues and sincere responses by blending personal experiences and arguments. As such, the post-test essay demonstrates a degree of sophistication that helps the reader to trust the writer.

The reasoned, logical character and strong voice of the post-test essay in contrast with the pre-test essay is notable, particularly considering the relatively short period of time - eight weeks. In the pre-test essay, the writer either lacked consideration for stronger arguments or failed to elaborate on connections between claim and reasons. His voice is undermined by his failure to include more personal experience and to consider the strongest reasons for and against his claim, and his lack of appropriate use of emotional and concrete language. All these weaknesses were greatly improved in the essay written after the pedagogical intervention.

4. Student evaluation of their learning

As shown in responses to the course evaluation questionnaire, instructing students in a social-cognitive approach to English argumentative writing can produce positive results. Here findings are reported in terms of student responses to the usefulness of this approach and their learning problems.

4.1 Usefulness

All participants responded positively to the open question with regards to the writing of English argumentation, *Do think you this approach help you write a better argumentative essay? If so, in what ways?* Their answers indicated that this approach facilitated their learning primarily in three aspects.

First, more than half of them (14 out of 22) acknowledged that they have learned to strengthen their arguments by examining the same issue from different viewpoints. One student stated, “I thought that writing an argumentation was easy, but not after the instruction. We have to consider about so many sides of a topic. I have learned to take the opinion of those who are against me. Particularly, what I think is 'right' way may sound crazy to the others”. Another student added, “Yes, I learned that writing an argumentation should combine your refutation to other people’s counterarguments”. Similarly, a third noted that “To writing an argumentation, we can’t only focus on our own thoughts and reasons. We also have to think of possible counterargument and furtherly understand their thoughts to give reasonable responses”.

Second, more than half (12 out of 22) noted that this approach provides multiple ways to generate reasons in support of their claim. One student stated, “Throughout the class, my ability of writing reasons for arguments improved the most. I learned how to organize reasons into different parts--fact, definition, cause/effect, and value. It also helps me to think from these aspects for reason when facing difficult arguments”.

Finally, almost 50% (10 out of 22) indicated that the necessity of connecting reasons to their claims is new to them. As Ming explained, “In the past, when I wrote argumentative texts, I just tried to write down any ideas came across my mind. I have never thought about that I need to make one step further by examining the connection between the reasons and claim”. Another student added, “Warrant is a new thing which I have never learned. It helps me to think clearly to write the argumentation. Besides, this strategy also trains our critical thinking”.

4.2 Problems

Although both the text analysis and student comments suggested the usefulness of this approach, some problems ensued as indicated in the responses to the question *What problems or difficulty do you have in composing argumentation after instruction?* Difficulties centered on developing persuasive reasons and providing reliable warrant. A great majority of participants (18 out of 22) acknowledged that they still struggled over constructing specific, defensible and audience-based reasons. As Vicky stated, “It’s quite difficult to construct the ideas (the chart). It really took a lot of time to

figure out all those persuasive reasons. Sometimes the reasons would be lack of persuasion or not specific enough.” Some of them pointed out more specifically their problems in employing the heuristics. Chris noted that “I have difficulties with the definition argument because I don’t know how to define a term clearly.”

Furthermore, other participants (11 out of 22) contended that they have difficulty in identifying the warrant underlying their reasons. One participant argued that “I always have difficulty in thinking warrants.” The other added, “Sometimes I really confused the differences between reason, warrant, and evidence. They look similar when I composed my piece.” Another student found that “Warrant is really tough. I think most of the time it’s redundant and unnecessary to include in my essay.” This finding is consistent with the textual analysis. Students made least progress, though still statistically significant, in this argumentative feature.

Student learning problems seem contradictory to their statement about the usefulness of this approach. It appears that students have acquired the metacognitive awareness about what constitutes a good argumentative essay but they are still not capable of producing effective arguments using their own criteria. After all, it takes a great amount of time to develop new mental habits. As most participants stated, more opportunities to practice the heuristics could enhance their ability to apply them in writing and ultimately improve the quality of their written texts.

Despite the positive gain from pre-test to post-test essays, these learning problems did indicate some challenges in implementing this approach. Although some studies have indicated teaching certain argumentative models leads to textual improvements (Knudson, 1992; & Yeh, 1998a), student understanding of the argument model, such as Toulmin’s (1958) model, may be mediated by various contextual factors, such as previous writing experience, classroom setting, and student interpretation and application of the taught model. This may make student understanding distinct from the teacher’s expectation, as cautioned by Lunsford (2002). The present findings indicate that teachers may need to develop more explicit rhetorical thinking strategies for L2 learners in composing argumentation beyond the patterns established in the rhetorical theories adopted in this study. Also, more qualitative data needed to be collected in order to explore these learning problems in greater depth to ultimately aid our students in constructing effective arguments.

5. Conclusion

The results of the present research showed that EFL novice writers can, in an appropriate learning context, demonstrate progress in formulating effective arguments. The progress made in this study offers hope that instruction that adopts the socio-cognitive approach may prove effective in raising L2 argument skills. Nevertheless, due to the lack of a comparison group, no hard and fast conclusion can be established that an argument not expressed by the participant in the pre-test but expressed by that participant in the post-test was certainly acquired as a function of this pedagogical intervention. Hence, by taking the participant responses to the questionnaire into account, I can conclude that this approach positively influences student attitudes. Still, further experimental research is needed with a larger sample size and a variety of students to substantiate the present study.

Another area for further potential research is the teaching of the two heuristics, argument and issue heuristics, on-line. Computer technology can deliver in-process guidance to students through self-accessed instructional software where they write assignments in their own discipline. Repeated exposure to a self-accessed instructional program is probably more effective than a limited number of classroom lessons in leading students to compose effective English argumentation.

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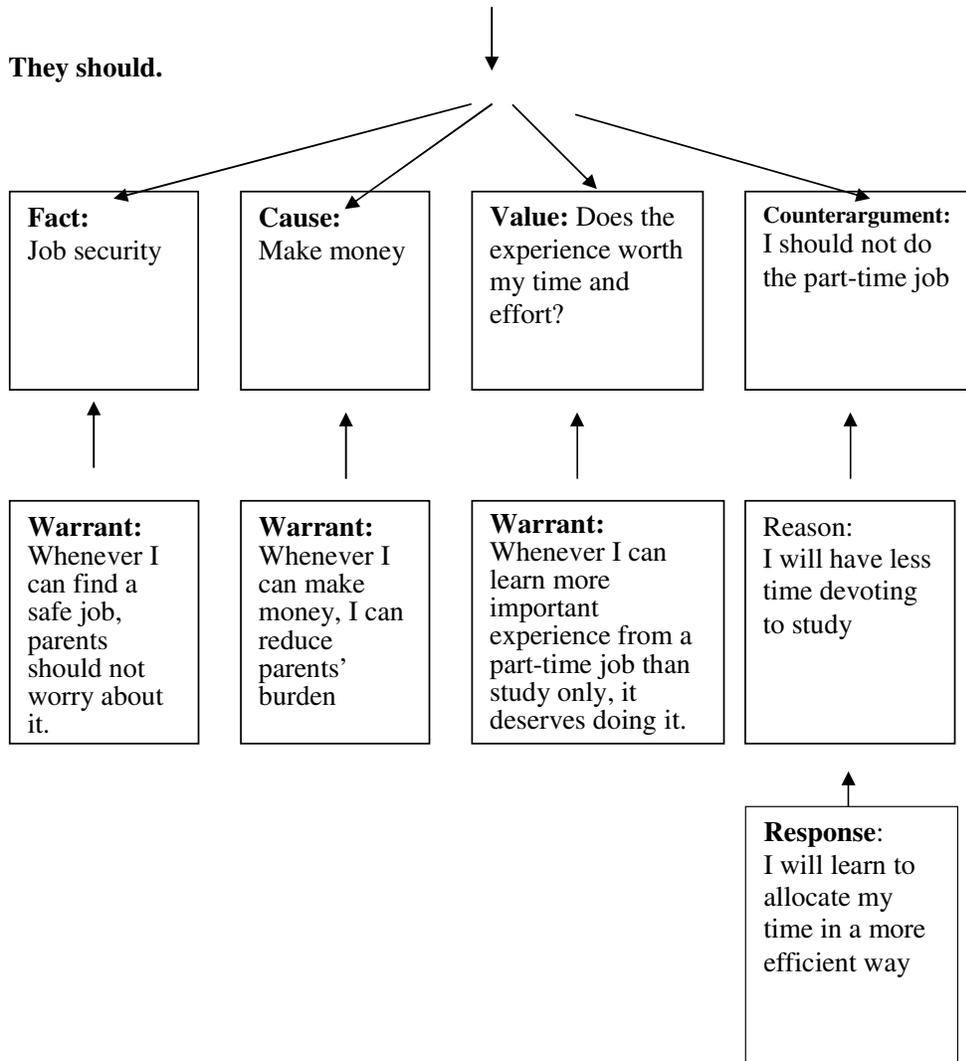
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Appendix A

Sample of a student's argument heuristic

Should my parents allow me to take a part-time job?



Appendix B

Student's evaluation questionnaire

21. Do you think this approach help you write a better argumentative essay? If so, in what ways?
22. What problems or difficulty do you have in composing argumentation after instruction?

Appendix C

Scoring rubrics

Claim/Issue

9. The primary claim seems clear without stating or identifying the specific problem/issue.
10. The primary claim seems clear but minimal introduction of the problem/issue is presented.
11. A consistent point of view is presented but moderate introduction of the problem/issue is presented.
12. A consistent point of view is presented and slightly elaborated. Moderate introduction of the problem/issue and its significance.
13. A consistent point of view is presented and moderately elaborated with somewhat explicitly and specifically stated problem/issue.
6. A claim with original personal insight is presented with explicitly and specifically stated problem/issue.

Reasons/Evidence

4. The reasons are relevant but unimportant.
5. The reasons are relevant and somewhat important but not well-developed.
6. The reasons are relevant and important but not well-developed.
7. The reasons are relevant and important and moderately developed.
8. The reasons are important, moderately developed with explicit connection to the claim. The reasons are convincing, important, strongly stated and richly developed.

Warrant

6. Minimal number of warrants is used. The implicit warrants only minimally reliable and relevant to the argument. Warrants may include logical fallacies.
7. Minimal number of warrants is presented. The implicit warrants somewhat reliable and relevant to the argument.
8. Some numbers of warrants is used. Some logical fallacies are evident.
9. Some numbers of warrants is used.
10. Warrants are reliable and relevant. Moderate numbers of warrants is used. Warrants are reliable and relevant.
11. Extensive use of warrants. Warrants are reliable and relevant.

Counterargument

9. No counterarguments have been mentioned.
10. Some relatively unimportant counterarguments are stated but not refuted or vice versa. Or one counterargument are mentioned in one sentence but not elaborated.
11. Some important counterarguments are elaborated but not refuted. One or more important counterarguments are refuted but not explicitly stated.
12. Some, but not all, important counterarguments are somewhat elaborated and refuted.
13. Some, but not all, important counterarguments are fully stated and convincingly refuted.
6. All important counterarguments have been fully stated and convincingly refuted.

Voice (*Writer's knowledge, personal experience, audience awareness, and emotional language use*)

13. The voice is extremely inappropriate and negative, a complete mismatch for the intended reader.
14. Lifeless, mechanical voice. The writer is uninvolved or distanced from the topic/audience. The text is developed primarily with general knowledge without any personal experience or insights.
15. Some concrete or emotional language is employed. The writer seems aware of an audience but includes few personal experience or insights to build up the writer's credibility. Only one or two points seems intriguing but quickly faded away.
16. The voice seems sincere but not fully engaging or involving. The text is a pleasant or even personable, but not compelling. The writing indicates moderate use of concrete or emotional language.
17. The voice is engaging or involving. The writing indicates appropriate use of concrete or emotional language.
6. The voice is engaging and full of personal insights. The writer crafts the writing with an awareness and respect for the intended audience and the purpose for writing. It shows why the readers need to know this and why they need to care.

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