

## **Communicating in English during Computer Science Internships**

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### **Abstract**

*An English for Specific Purposes (ESP) course for internship was offered to Computer Science students at a university in Hong Kong. Seven teaching items were requested to be included in a 13-week course by an accreditation body. Thus, the course became congested and problematic. To tackle the root of the problems, a needs analysis was carried out with 105 students in this course through a questionnaire to identify the items that were really relevant for internship so that more accurate decisions could be made regarding what to include and remove from the course. Results suggest that the course should cover reading and writing emails, and that report writing, oral presentation and meeting skills could be retained. The findings could be used as a reference for the future design of ESP courses that prepare students for their internships in this university and similar learning contexts in different parts of the world.*

**Keywords:** Computer Science internship; English communication needs in the workplace; English for specific purposes courses

### **1. Introduction**

English for Specific Purposes (ESP) courses became a vital activity for teaching English in the 1970s (Rahman, 2012) and are usually offered in universities to prepare students for specialized purposes (Hadjiconstantinou & Nikiforou, 2012). A special feature of an ESP course is that the course content and the topic chosen in the course are closely related and relevant to the students' studies (Hadjiconstantinou & Nikiforou, 2012). It also needs to meet the specific needs of the learner (Dudley-Evans, 1998), which are commonly identified through needs analysis.

An English for Specific course was designed to prepare Computer Students for their internship in a university in Hong Kong. The course has undergone requested changes which bring about problems that trigger off the need to re-identify the contents of the course through needs analysis. This paper reports on a needs analysis study which helps to decide on the appropriate items to be included in this course.

### **2. Background information about the ESP course for Computer Science Studies in the university of this study**

A 13-week English Communication Skills course for Computer Science Studies was offered to first-year students in the Computer Science Department in a university in Hong Kong to prepare them for their third-year internship. In this "sandwich program", students were placed in different organizations to learn how to work in the Computer field during the year of their internship. In their fourth year, the students would continue their final-year study in the university.

For many years, the contents of the course covered conducting a technical interview, writing a memorandum report, writing a proposal, giving an oral presentation and engaging in negotiation. However, a few years ago, following recommendations made by an accreditation body, to which the courses in the department needed to be submitted for review and comments periodically, and at the request of the Computer Science Department, two items were removed from the course.

Conducting a technical interview and engaging in negotiation were replaced by conducting a meeting, writing an agenda, writing minutes and writing a letter. To sum up, the contents of the new course thus included conducting a meeting, writing an agenda, writing minutes, writing a memorandum report, writing a letter, writing a proposal and giving an oral presentation. Thus, the course became congested and caused many problems related to the design, tasks, assignments and teaching methods. For example, there was insufficient time to cover all the topics thoroughly within the 13 weeks allocated. Students became easily confused about the different genres taught, and their heavy workload was matched by a greater marking load for teachers.

To tackle the root of the problem of a tightly congested ESP course, 17 students who had completed an internship participated in a preliminary needs analysis study on the English communication needs of computer science students undertaking their internships to establish whether some of the teaching items could be discarded, keeping only those that were truly helpful and relevant to students during their internships. The results of the preliminary study showed that most students were seldom required to write letters, agendas and minutes and conduct meetings in English during their internships. However, most of them frequently had to read and write emails and sometimes reports.

To ensure that correct course inclusion and exclusion choices were made, a larger sample of 105 students who had also completed internships then took part in a larger-scale needs analysis study, using the same research instruments as in the preliminary study, to determine the communication skills students most needed in their internships. The rationale was that if the results of the larger-scale study supported and confirmed those resulting from the preliminary study, more certain decisions could be made regarding what to include and exclude from the course.

This paper reports on the larger-scale study which attempted to investigate the English communication needs of 105 computer science students during their internship to help make appropriate decisions on what should be included and excluded from an overly congested ESP course which prepared students for their internship. The purpose was to help the course designer of this ESP course make informed decisions on the course content so that it became manageable and could really meet the needs of the students. The results could also be a source of reference for the design of pre-internship ESP courses for computer science students, or even students in other disciplines, in other institutions having similar learning contexts not only in Hong Kong but in other parts of the world.

### **3. Literature review**

This section contains a literature review on needs analysis and the English communication needs of employees in the workplace.

#### **3.1 Needs Analysis**

Needs analysis is defined by Brown (1995) as “the activities involved in gathering information that will serve as the basis for developing a curriculum that will meet the learning needs of a particular group of students”. It is important to do needs analysis when deciding on the content of a course. Jordan (1997) sees needs analysis as a starting point for course design. McDonough (1984) also states that the language needs of the learner should be the basis for course development.

Relating to ESP, Flowerdew (2013) mentions that needs analysis is carried out to identify the “what” and “how” of a course and is thus the first stage in ESP course development. Belcher (2006) also opines that needs analysis is the foundation on which all other decisions about ESP are or should be made. Dudley-Evans and St John (1998, p.122) more specifically mention that ‘needs analysis’ is the “cornerstone of ESP” and that it leads to a “very focused course.” Astika (1999) states even more explicitly that needs analysis is an essential aspect of ESP syllabus design in order to link the students’ academic needs with their needs in their prospective employment. Spence and Liu (2013) also confirm that in order to make sure what is learned in class is directly related to the skills that are relevant to the students’ jobs, a needs analysis is invaluable. Kaewpet (2009) goes one step further by explaining that when a needs analysis indicates exactly how ESP can help learners with their language use in the real world, the learners’ communication needs will become obvious.

Dudley-Evans and St John (1988, p.122) identify three kinds of needs analysis: (1) target situation analysis (TSA), which deals with professional information about learners’ “objective, perceived and product-oriented needs” such as tasks or activities learners need to engage in when using English; (2) learning situation analysis (LSA), which deals

with personal information about learners' "subjective, felt and process-oriented needs" such as their learning experiences, motivation and attitude to English; and (3) present situation analysis (PSA), which deals with information about the English language abilities of learners such as their strengths and weaknesses in language use and skills (Dudley-Evans and St John, 1998, pp.123-124). As Chambers (1980, p.32) notes, among the needs determined by the three types of needs analysis, those identified by TSA are "real" needs that are "relatively permanent" and are thus useful in informing the aims of a course. As the studies reported here were exploratory in nature, their focus was on the analysis of needs in the target situation. Taking subjective learner needs into account was beyond the scope of this study.

In line with the TSA approach, West (1994, p.1) defines 'needs analysis' as identifying what learners need to do with the foreign language in the target situation and how they could best master the target language during training. Similarly, Brumfit (1979, p.186) sees a needs profile as a guideline which helps to match the syllabus with the demands of the real world. To carry out TSA, Chambers (1980, p.25) suggests going into the target situation to collect data and analyse them to establish the functions, forms and frequency of communication that really occurs. The needs analysis should basically be concerned about identifying communication needs and their realizations (Chambers 1980, p.29). This provides a basis for decisions to be made regarding the long-range aims of a course.

To decide on the content of a focused course, Brady (1992) states that one criterion for selection of content is the criterion of utility, which suggests that the content should be the most useful to the students in coping with their future. Such usefulness can be determined by the perceived frequency of use of that teaching item by the students in the future. Jones (1991) also mentions that the needs questionnaire data is traditionally analysed in terms of the frequency of use as declared by the subjects. Thus, frequency was chosen as the main element for examination in this study.

### **3.2 English communication needs of employees in the workplace**

A review of the literature shows that the English communication needs of employees have been analysed in detail in a large number of workplaces such as industrial firms (Cowling, 2007), multinational chemistry companies (Kassim & Ali, 2010), oil companies (Holliday, 1995), banks (Chew, 2005; Edwards, 2000), textile clothing merchandisers (Li & Mead, 2000) and semiconductor manufacturing companies (Spence & Liu, 2013).

Some communicative events important to employees were also identified in the literature. For example, Kaur and Lee (2006) and Maes et al. (1997) state that oral communication in English was the most important skill for employment, job success and promotion. Kaur and Lee (2006), in their study on the oral communication needs in English among Information Technology (IT) graduates, who usually either majored in Engineering or Computer Science, found that the communicative events involved were: participating in meetings, handling complaints, giving oral presentations, having informal discussions with supervisors, and interviewing others to get feedback or information.

Among engineers, who often have computer knowledge or team up with Computer Scientists to perform Information Technology (IT) tasks, some commonly reported communicative events usually include reading professional texts, writing periodic or progress reports, listening to presentations in a meeting, delivering oral presentations and engaging in professional conversations (Torries & Barbera, 2002; Brinkman & Geest, 2003; Freeman, 2003; Levis & Levis, 2003; Anthony & Lashkia, 2003; Pritchard & Nasr, 2004; Kaewpet, 2009).

More specifically, in their study carried out with engineers from 10 multinational chemical companies in Malaysia, Kassim and Ali (2010, p.168) report communicative events considered important to engineers. These events are "teleconferencing, networking for contacts and advice and presenting new ideas and alternative strategies." However, their study focuses on oral communication skills though they also deal briefly with the other three language skills (reading, writing and listening) for comparison.

Kaewpet (2009), on the other hand, investigates the communication needs of Thai civil engineering students in relation to the four language skills by interviewing twenty-five stakeholders.

Based on the findings, he recommends incorporating four communicative events into an ESP course. These events include reading textbooks and manuals, writing periodic/progress reports and talking about daily tasks and duties. While all four language skills were necessary, reading was named as the most essential followed by writing.

Spence and Liu (2013) also investigated the English communication needs in relation to the four skills of some progress integration engineers at a semiconductor manufacturing company in Taiwan through online survey-questionnaires and semi-structured interview questions, and came up with slightly different results. They found that examples of the highly frequent writing and reading events were emails, reports, memos and common oral events included meetings, teleconferences and presentations. Spence and Liu (2013) see that engineers have dual needs in English. Besides having English proficiency in the engineering context, they also need to be proficient in English in the business context to attract loyal customers.

However, the targets of the studies carried out by Kassim and Ali (2010), Kaewpet (2009) and Spence and Liu (2013) were engineers. It was not known how many of them majored in Computer Science.

As commented by Pholsward (1993), little research work has been done on the language needs of computer science students in their workplace. There appears to be a lack of criteria for developing materials on an empirical basis.

Among the few studies related to the English communication needs in computer science field, Pholsward (1993) investigated the English language needs of Thai Computing professionals, most of whom had worked at the managerial level for over six years. He found that speaking and reading were very important to these professionals, followed by writing. Speaking was of prime importance, even in lower-level jobs, because computing companies had an international network and poor oral English would lower the company's competitive power with other companies. Reading was also important because they frequently needed to update information from a variety of sources. Writing was not needed so much because they could assign the drafting and writing jobs to their subordinates. The types of materials frequently read by the subjects of the study were newspapers, textbooks and journals. The writing tasks most frequently required were writing reports, short notes, memorandums, summaries and correspondence. The frequently required listening/speaking tasks were contacting customers, etc., conducting meetings, and holding general or telephone conversations. Since the study was conducted in 1993, the findings obtained might have become dated.

More recently, Kaneko et al. (2009) conducted a survey of workplace English needs among Computer Science Graduates in Japan through a comprehensive survey. They found that the most frequent tasks for the workplace were reading and writing of business-type documents such as emails, memos, faxes both when frequency was calculated daily or when frequency was calculated to include both scores for daily use and scores for tasks performed once or twice a week. When the combined calculation method was used, reading and writing of reports and technical documents came second and user manuals or other instructions came third. Regarding listening, listening to lectures or presentations came first when both frequency calculation methods were used. When the combined calculation method was employed, listening to a conference call or recorded message came second. Regarding speaking, the most frequently used skills daily and once or twice a week was the speaking skills for social interaction in conversation and small talks. When the combined calculation method was used, talking in a group meeting came second; talking on the telephone came third and giving a lecture or presentation came fourth. However, the subjects of Kaneko et al.'s (2009) study were computer science graduates who were employees in their workplaces but not students in their internships.

In fact, the communication needs identified in the above-mentioned studies relate to professionals employed in the workplace in different Asian countries other than Hong Kong. Almost no studies focus on the communication needs of students in an internship, which may be different from those of the professionals in the workplace because of the different nature of work assigned to them due to their different levels of experience.

To fill the gap in the literature, the studies reported here investigated the communication needs of computer science students in relation to all four language skills during their sandwiched year of internship while studying at a university in Hong Kong.

#### **4. Research questions**

To investigate the communication needs of computer scientist students during their internships, an attempt was made to explore how frequently the communicative events that were suggested to be added to the course by the parent department were carried out in the workplace to give an idea about whether it was really necessary to add those items to the course. The communication needs of students in relation to the four language skills were investigated.

The research questions addressed in this study were:

- (1) During the students' internship, what is the frequency of carrying out the communicative events added to the course by the parent department?
- (2) What are the communication needs of students in relation to the four language skills during their internships?

#### **5. Research Methods**

##### **5.1 Subjects**

Dudley-Evans and St John (1998, p.132) suggest that the main sources for needs analysis are “the learners, people working or studying in the field, ex-students, documents relevant to the field, clients, employers, colleagues and ESP research in the field.” These sources are applicable to the needs analysis of employees in an organization. However, as the focus of this study was on students undertaking their internship, the main source of analysis was naturally the students themselves. The subjects in this study were computer science students who had just returned to the university from a one-year internship undertaken as part of a four-year sandwich program to continue with their studies in their final year. 105 students participated in this study.

The students' work situation during their internship is presented below.

##### *5.1.1 Kinds of institutions in which the students worked during their internship*

The kinds of institutions in which students in the study worked during their internships are summarised in Table A.

[ Insert Table A here ]

##### *5.1.2 Posts that the students held in the institution*

The posts that the students held in the institutions are summarized in Table B.

[ Insert Table B here ]

##### *5.1.3 Main duties that the students had in the institutions*

The main duties that the students had in the institutions are summarised in Table C.

[ Insert Table C here ]

##### **5.2 Research instruments and data collection**

Dudley-Evans and St John (1998) suggest the main methods of data collection for needs analysis are “questionnaires, analysis of authentic spoken and written texts, discussions, structured interviews, observations and assessment.” Li and Mead (2000) added to this list of methods telephone interviews, analysis of authentic correspondence and workplace visits. Long (2005) also suggests language audits and journals as possible research instruments. However, questionnaires (Jordan & Mackay, 1973; Richterich & Chancerel, 1977; Mackey & Bosquet, 1981; Li & Mead, 2000; Al-Khatib, 2005; Chew, 2005) are the most commonly used instruments for needs analysis. As suggested by Christinson and Krahnkc (1986) and Howell (1995), students' own experience and views can provide valuable information and can be used as a basis for planning teaching programmes. Students' views can be easily and effectively elicited through questionnaires. Thus, a questionnaire was used as the instrument of investigation in the preliminary study and this study.

The questionnaire (see Appendix A) consisted of 2 questions. Questions 1 a) and b), which addressed research question 1, asked students about the frequency with which they wrote certain documents in English and spoke in and listened to English on certain occasions during their internships, with responses being given on a five-point Likert Scale. Only certain communicative events, which were suggested to be included in the new syllabus, were listed in this question. Question 2 a) to d) concerned the communication needs of students during their internship.

The questionnaire was given to 105 computer science students who had just returned from their internships to continue with their final year studies at the university to establish their communication needs during their internship. As the questionnaire was completed outside class but was collected during class time, a high return rate of 95% was achieved.

### **5.3 Data analysis**

Descriptive statistics (mainly frequencies) were computed for the quantitative part of the questionnaire. Open-ended questions were analyzed using the method of content analysis, through which “fairly simple classifications or tabulations of specific information” were formulated (Borg & Gall, 1989, p. 520) and frequency counts were tallied on some classified items.

## **6. Results**

The questionnaire results are reported in sub-sections 6.1 to 6.2.

### **6.1 The frequency of different communicative events**

#### *6.1.1 How frequently the students wrote different documents*

The results are shown in Table D.

[ Insert Table D here ]

Table D shows that a very low percentage of students always or often needed to write letters (10.8%), minutes (11.6%) and agendas (3.9%) which were items that were requested to be added to the course by the parent department.

#### *6.1.2 How frequently the students needed to conduct a meeting in English or attend meetings conducted in English*

The results are shown in Table E.

[ Insert Table E here ]

As shown in Table E, less than 50% of the students needed to conduct a meeting in English or attend a meeting conducted in English. At the same time, should the occasion arise, more students would need to attend a meeting conducted in English than needing to conduct one themselves.

### **6.2 The communication needs of students during their internship**

#### *6.2.1 What students needed to read in English during their internship*

The types of documents reported by the students are shown in Table F.

[ Insert Table F here ]

Table F shows that over 50% of the students (60.9%) read emails.

#### *6.2.2 What students needed to write in English during their internship*

The results are shown in Table G.

[ Insert Table G here ]

Table G shows that over 50% of the students (78.1%) wrote emails. Almost 50% (46.7%) of students also needed to write reports which included test reports, weekly working reports, work programs reports, placement reports, evaluation reports, software development life cycle reports, bug reports, error reports and pilot reports.

### 6.2.3 Types of occasions on which students needed to speak in English during their Internships

When answering 2c) of the questionnaire, 38.1% of the students reported that they did not need to speak in English, and 8.6% responded that they seldom needed to speak in English.

Table H reports results relating to the types of occasions at which the students needed to speak in English during their internship.

[ Insert Table H here ]

As shown in Table H, slightly larger percentages of students (22.9%) needed to speak at meetings, to communicate with native speaker colleagues and foreigners (14.3%), or engage in telephone conversations (9.5%) in English.

### 6.2.4 Types of occasions on which the students needed to listen to someone speaking in English during their internships

When answering question 2d) of the questionnaire, about 29.5% of the students stated that they did not need to listen to someone speaking in English during their internship, and 4.8% replied they seldom needed to do so.

Table I reports results relating to the types of occasions at which the students needed to listen to someone speaking in English during their internships.

[ Insert Table I here ]

Table I demonstrates that slightly higher percentages of students needed to listen to English in meetings (28.6%), seminars, talks, presentations (11.4%) and telephone conversations (11.4%).

## 7. Discussion

In this section, the answers to the two research questions are discussed. The contents of the ESP course derived from the findings of research question (1) and (2) will be examined.

From the results of the study, it is plain to see that the students need help in many areas and it is not feasible to cover the skills and communicative situations needed in a relatively short ESP course. At least some employers are expecting something they are not getting, that is, interns with the skills required to seamlessly integrate into the workplace. It would be helpful if the duration of the ESP course could be extended or an additional course could be offered so as to be able to cover the communicative situations required of interns in greater depth and thus increase students' competence. However, this is not workable in the current situation of the university involved in this study. When all the core courses have been crammed into the students' time tables, their schedules are so tight that there is no room for an additional ESP course. Thus, the only option is to discard some teaching items in the course, keeping those that are truly helpful and relevant to student internship needs as suggested by the findings of this study.

In this study, although some students mentioned that they did not need to or seldom needed to speak in or listen to English, none of them stated this when they reported on the kinds of documents they read or wrote in English. This indicates that unlike the findings of some employment surveys conducted which show that more emphasis should be given to oral communication skills (Pholsward, 1993; Maes et al., 1997; Chang, 2004; MEF, 2004; Ungku Harun, 2004; Kaur & Lee, 2006; Kassim & Ali, 2010), the students in these studies needed to read and write in English more than they had to speak in or listen to English during their internship. This suggests that the ESP course used to prepare these computer science students for their internships could have a greater focus on reading and writing skills, as speaking and listening skills were not viewed as so essential. It makes sense to have such a focus as it also applies to those engineers in the workplace described in the studies of Kaewpet (2009), Male et al. (2009) and Spence and Liu (2013).

The items to be included in or removed from the existing course are discussed below.

### **7.1 Emails**

In line with the findings of Kaneko et al's (2009) and Spence and Liu's (2013) studies and Flowerdew's (2013) remark that emails are important for written communication in the workplace transnationally, both in Asia (Evans, 2010) and Europe (Louhiala-Salminen, 2002; Rogerson-Rovell, 2007), a majority of students in this study always or often read and wrote emails. This suggests that one major item missing from the course is reading and writing emails. Because emails are used so frequently each day, there is often a false impression that students automatically acquire knowledge about this genre, which does not thus need to be taught. Some students reported in the open-ended question in the questionnaire that when they needed to copy their emails to management, they had to write formal emails. Because drafting emails now often requires the preparation of attachments, some of which may be formal, there is an urgent need to include this component in the course. As professionals need to tailor their messages to the role and requirement of the recipients and the conventions that their colleagues or clients are using (Evans 2012), the greatest challenge is to help the students identify format, language and style differences that need to be considered according to changes in the audience and the degree of formality of the email. A whole unit in the course could be devoted to teaching the students how to write informal and formal emails to different readers who had different work relationships, power relationships and social distance with the writer encouraging them to become aware of the differences in the language use of each setting.

### **7.2 Reports**

Like the subjects in the studies of Kaewpet (2009) and Spence and Liu (2013), in this study, almost 50% of the students needed to write reports. Report writing thus seems to be an item that could be retained in the course.

### **7.3 Letters, proposals, agendas and minutes**

A very low percentage of the students (less than 10%) needed to write letters, proposals, agendas and minutes. This suggests that if there is not enough time to teach all forms of writing covered in the course, these items may be cut. Some students reported in the open-ended question of the questionnaire that these tasks are usually performed by supervisory-level staff members in the company. They usually played the role of junior staff in their internships and they were often given templates to use or samples to follow if they were asked to write documents of these types. The conventions taught in the course usually did not match those used in the workplace. Although it is important that students are taught the generic structure or format of these kinds of documents, the teacher should also focus on helping students to acquire the ability to follow conventions and to use this ability to adapt to different work situations where different conventions need to be followed.

### **7.4 Giving an oral presentation**

It seems important to retain this item in the course because the highest percentage (22.9%) of students were sometimes asked to give a brief presentation in a meeting. Such retention is also supported by Spence and Liu's (2013) findings.

### **7.5 Conducting a meeting**

In this study, far less than 50% (22.9%) of the students needed to conduct a meeting in English or attend a meeting conducted in English, although the latter was more common than the former. If time permits, this task could still form part of the course.

In sum, the findings suggest the items that should be included in the existing ESP course are emails, reports and giving an oral presentation. If time permits, conducting a meeting could also be included.

It is true that there is now an overlap between the English needs in the business and engineering world (Spence & Liu, 2013) and that increasing attention seems to have to be paid to the documents in the business field. However, in a situation when an ESP course for internship is overly congested, it seems that there is only enough time to deal with the most frequently needed communicative skills during internship, namely emails, reports and giving an oral presentation or if time permits, conducting a meeting. The teaching of some business documents such as letters, proposals, agendas and minutes might have to be left out at this stage and perhaps dealt with in another ESP course for employees in the workplace in future.



The findings seem to signal to the academic committees of the Computer Science department the necessity of planning an additional ESP course for their students though challenges in relation to squeezing an additional course into a tight program will be posed for them.

### **8. Conclusion**

The findings of this study and the preliminary study are mutually supportive, helping give a clear picture of the English communication needs of students undertaking an internship while studying Computer Science at university. While most of the literature cited in relation to the studies on communication needs of engineers or computer scientists (Pholsward, 1993; Kaewpet, 2009; Kaneko et al., 2009; Kassim & Ali, 2010; Spence & Liu, 2013) address the needs of professionals in the workplace, this study contributes to the knowledge base by throwing light particularly on the communication needs of computer science students during their internship, which is an unexplored area that is worthy of investigation.

As the interns have the dual role of a student and an employee, the information provided by the interns in this study valuably bridge the knowledge gap between the workplace communication needs of the computer science students as perceived by the college ESP course designers and the actual needs as perceived by the professionals in the field.

While not supporting the findings of some employment surveys which suggest more emphasis on oral communication skills (such as Pholsward 1993, Chang 2004, Kaur and Lee 2006, Kassim and Ali 2010), but confirming the results of the studies of Kaewpet (2009), Male et al (2009) and Spence and Liu (2013), the findings of this study indicate that an ESP course for computer science internship should focus on reading and writing. They also provide a clear indication of the actual items that should be included in the course, namely emails, reports, oral presentations and if time permits, conducting meetings. The findings of this study do not only fill the unexplored area of internship with concrete information, they will also become a useful source of reference for designers of courses that prepare computer science students for their internship, not only in Hong Kong, but also in similar learning contexts in different parts of the world.

The relevance could also be transferred to any student pre-internship preparation program, whether in Information Technology, engineering or in completely different fields such as business or service industries, where the communicative tasks in the workplace might be broadly similar.

In the research field, the research design of the present study, such as basing the criterion of selection of content on the criterion of utility (Brady, 1992) and frequency of communication that occurs in the target situation (Jones, 1991; Chambers, 1980), could be suitably adopted and /or adopted as appropriate to conduct similar needs analysis in any relevant discipline in other parts of the world.

Though the sample in this study was not small, given that it was drawn exclusively from computer science students in one ESP course at a single university, the findings may not be generalizable to all computer science students in all ESP courses at all universities.

However, as there is a growing demand for internships in different disciplines, there is an increasing need for ESP courses that prepare students for internships. If this study is replicated to include much larger samples from more institutions in more disciplines or contexts to prepare for internships, students from a broader academic community could also benefit.

The research method whereby the findings of a preliminary study are confirmed through a larger-scale study has proven a successful way to identify the real needs of the students in a target situation. This opens up a new path for needs analysis of an exploratory nature. Such exploratory research can be further developed into more sophisticated empirical studies using larger samples from a larger number of classes in more universities in different parts of the world. The findings of such studies can then be generalized to inform the design of courses that maximize the benefits for students.

The results of this study also demonstrate the feasibility of basing course revision decisions on empirical findings. To help students fully benefit from the contents of a revised course, it is important for accreditation bodies to ensure their recommendations have grounding in the literature and quantitative and/or qualitative research findings.

In short, this study opens up research on the English communication needs of students during internship. The results of this study could be a source of reference for the course design of pre-internship ESP courses not only for Computer Science students, but also for students in other disciplines in this university and in other institutions having similar learning contexts not only in Hong Kong but in other parts of the world.

## References

- Al-Khatib, M.A. (2005). English in the workplace. An analysis of the communication needs of tourism and banking personnel. *Asian EFL Journal*, 7 (2), 175–195.
- Anthony, L., & Lashkia, G.V. (2003). Mover: A machine learning tool to assist in the reading and writing of technical papers. *IEEE Transactions on Professional Communication*, 46, 185–193.
- Astika, G. (1999). The role of needs analysis in English for specific purposes. *TEFLIN Journal*, 10, (1), 1-77.
- Belcher, D. (2006). English for specific purposes: Teaching to perceived needs and imagined futures in worlds of work, study and everyday life. *TESOL Quarterly*, 40 (1), 133-156.
- Borg, W. & Gall, M. (1989). *Educational research: An introduction*, (5<sup>th</sup> ed.). New York: Longman.
- Brady, L. (1992). *Curriculum Development*, (4<sup>th</sup> ed.). New York: Prentice Hall.
- Brinkman, G.W., & Geest, T.M.V.D. (2003). Assessment of communication competencies in engineering design projects. *Technical Communication Quarterly*, 12. Available: <http://proquest.umi.com.mate.lib.unimelb.edu.au>. Retrieved 26.01.06.
- Brown, J. D. (1995). *The Elements of Language Curriculum: A systematic approach to program development*. Boston: Heinle & Heinle Publishers.
- Brumfit, C. (1979). “Communicative” language teaching: an educational perspective. In C. Brumfit, & K. Johnson. (Eds.), *The Communicative Approach to Language Teaching*. Oxford: Oxford University Press.
- Chambers, F. (1980). A re-evaluation of needs analysis in ESP. *The ESP Journal*, 1 (1), 25–33.
- Chang, M. (2004). Why some graduates are more marketable than others [ PowerPoint slides]. Available: <http://www.epu.gov.my/seminars>.
- Christinson, M.A. & Krahnkc, K.J. (1986). Student perception of academic language study. *TESOL Quarterly*, 20 (1), 61-79.
- Cowling, J. D. (2007). Needs analysis: Planning a syllabus for a series of intensive workplace courses at a leading Japanese Company. *English for Specific Purposes* 26, 426–442.
- Dudley-Evans, T., & St. John, M.J. (1998). *Developments in English for Specific Purposes*. Cambridge: Cambridge University Press.
- Edwards, N. (2000). Language for business: effective needs assessment, syllabus design and materials preparation in a practical ESP case study. *English for Specific Purposes*, 19, 291–296.
- Evans, S. (2010). Business as usual: The use of English in the professional world in Hong Kong. *English for Specific Purposes*, 29, 153-67.
- Evans, S. (2012). Designing email tasks for the Business English classroom: Implications from a study of Hong Kong’s key industries. *English for Specific Purposes*, 31, 202-212.
- Flowerdew, L. (2013). Needs analysis and curriculum development in ESP. In B. Paltridge & S. Starfield (Eds.), *The Handbook of English for Specific Purposes*. Malden, Ma: John Wiley & Sons Inc.
- Freeman, J. (2003). The science of conversation: Training in dialogue for NNS in engineering. *IEEE Transactions on Professional Communication* 46, 157–167.
- Hadjiconstantinou, S. & Nikiforou, E. (2012). ESAP courses: An innovative vista in language learning: From needs analysis to evaluation. *English for Specific Purposes World*, 36 (12), 1-15.
- Holliday, A. (1995). Assessing language needs within an institutional context: An ethnographic approach. *English for Specific Purposes* 14 (2), 115–126.
- Howell, F. (1995). Chinese language learning: Student needs and expectations: A case study. *Babel*, 30 (2), 22-27, 33.
- Kaewpet, C. (2009). Communication needs of Thai civil engineering students. *English for Specific Purposes*, 28 (4), 266–278.

- Kaur, S. & Lee, S.H (2006). Analysing workplace oral communication needs in English among IT graduates. *English for Specific Purposes World*, 5 (1), 1-8.
- Kassim, H., & Ali, F. (2010). English communication events and skills needed at the workplace: Feedback from the industry. *English for Specific Purposes* 29, 168–182.
- Kaneko, E., Rozycki, W. & Orr, T. (2009). Survey of workplace English needs among computer science graduates. In IEEE International Professional Communication Conference(pp.1-6)Available: <http://doi.ieeecomputersociety.org/10.1109/IPCC.2009.5208704>.
- Jones, C. (1991). An integrated model for ESP syllabus design. *English for Specific Purposes* 10, 155-172.
- Jordan, R.R. (1997). *English for Academic Purposes*. New York: Cambridge University Press.
- Jordan, R., & Mackay, R. (1973). A survey of the spoken English problems of overseas postgraduate students at the universities of Manchester and Newcastle-upon-Tyne. *Journal of the Institute of Education of the Universities of Newcastle-upon-Tyne and Durham*, 25, 125.
- Levis, J.M., & Levis, G.M. (2003). A project-based approach to teaching writing to teaching research writing to non-native writers. *IEEE Transactions on Professional Communication*, 46, 210–220.
- Li, F., & Mead, K. (2000). An analysis of English in the workplace: the communication needs of textile and clothing merchandisers. *English for Specific Purposes*, 19, 351–368.
- Louhiala-Salminen, L. (2002). The fly's perspective: Discourse in the daily routine of a business manager. *English for Specific Purposes*, 21, 211-31.
- Mackey, R., & Bosquet, M. (1981). LSP curriculum development – from policy to practice. In R. Mackay, & J. Parmer (Eds.), *Languages for Specific Purposes*. Rowley, MA: Newbury House.
- Maes, C.R., Larsen, J., & Gaiten, J. 1997. A managerial perspective: Oral communication competency is most important for business students in the workplace. *The Journal of Business Communication*, 34,67-80.
- Malaysian Employers Federation. (2004). Facing the realities of the world of work [ Power Point slides ] . Available: <http://www.epu.gov.my/seminars>.
- Male, S.A., Bush, M.B., & Chapman, E.S. (2009). Identification of competencies required by engineers graduating in Australia. Available: <http://aaee.com.au/conferences / AAEE2009/PDF/AUTHOR/AE090085.PDF>.
- McDonough, J. (1984). *ESP in Perspective: A Practical Guide*. London: Jo McDonough.
- Pritchard, R.M.O., Nasr, A. (2004). Improving reading performance among Egyptian engineering students: Principles and practice. *English for Specific Purposes* 23, 425–445.
- Richerich, R., & Chancerel, J.L. (1977). *Identifying the Needs of Adults Learning a Foreign Language*. Oxford: Pergamon.
- Rogerson-Revell, p. (2007). Using English for international business: A European case study. *English for Specific Purposes*, 26, 103-120.
- Pholsward, R. (1993). The English language needs of Thai computing professionals. *RELC Journal*, 24 (1), 1-25.
- Rahman, M. (2012). The English language needs of Computer Science undergraduate students at Putra University, Malaysia: A focus on reading skills. *English for Specific Purposes World*, 34 (12), 1-24.
- Spence, P., & Liu, G.Z. (2013). Engineering English and the high-tech industry: A case study of an English needs analysis of process integration engineers at a semiconductor manufacturing company in Taiwan. *English for Specific Purposes* 32, 97-109.
- Torries, E.L., & Barbera, M.D.P. (2002). An ESP program for students of shipbuilding. In Orr, T. (Ed.), *English for Specific Purposes*. Alexandria, Virginia: Teachers of English to Speakers of Other Languages, pp.71–88.
- Ungku Harun, A.L. A. (2004). Meeting the demands of global firms: Survey finding [ PowePoint slides ]. Available://www.epu.gov.my/seminars.

## Appendix A

### Questionnaire on Communication Skills needed during internship

**1. a) During your internship, how frequently did you need to write the following documents in English? Please tick in the right box below**

Types of writing (in English)	Always 5	Often 4	Sometimes 3	Seldom 2	Never 1
Agendas					
Minutes					
Letters					

**b) During your internship, how frequently did you need to conduct or attend meetings in English? Please tick in the right box below.**

Meeting	Always 5	Often 4	Sometimes 3	Seldom 2	Never 1
Conduct a meeting in English					
Attend a meeting conducted in English					

**2. What kinds of communication skills were needed during your internship?**

- a) What did you need to read in English during your internship? Please elaborate.
- b) What did you need to write in English during your internship? Please elaborate.
- c) On what occasions did you need to speak in English during your internship? Please elaborate.
- d) On what occasions did you need to listen to someone in English during your internship? Please elaborate.

**Table A: The kinds of institutions in which the students worked during their internship**

Field	Institution
Finance	Bank Financial company
Information Technology	Information technology company Software and web development company Computer research centre Consultant company
Trading	Shipping and logistics Warehouse
Public Services	Government organization Public affairs/services Housing-related organization Medical institution Electrical company Mass Transit Railway News agency
Education and Culture	Educational institution Exhibition centre Book store

Table B: The posts that the students held in the institutions

The posts that the students held in the institutions	
Programmers	Student programmer Inter analyst programmer
Trainees	Student trainee Information technology trainee Industrial placement trainee Specialist trainee Information technology placement trainee E-marketing trainee
Developers	Web developer Application developer
Engineers	Trainee engineer Software engineer Technical support engineer
Technical supporters	Technician Technical associate Technical assistant
Tester	
Information Technology consultant	
Project officer	
Technical salesperson	

Table C The main duties that the students had in the institutions

Area	Duties
Information Technology	Testing Programming Providing technical support Web development System development Documentation Website maintenance Project development System maintenance System management Fixing program bugs Software development Setting up demos Coding Re-engineering an existing system Implementing a web application Monitoring servers
Administration	Assisting the head Coordination Interdepartmental liaison Communicating with vendors E-marketing Preparing financial supports Maintaining and updating inventory records Analyzing data Creating PDF forms Answering phone calls Booking rooms Meetings and activities coordination Sending reminders to teammates Checking emails

Table D: How frequently the students wrote different documents

Types of writing (in English)	N= 105 (Always and often)
Letters	10.8%
Minutes	11.6%
Agendas	3.9%

Table E : How frequently the students needed to conduct a meeting in English or attend meetings conducted in English

Meetings	N= 105 (Always and often)
Conduct a meeting in English	11.4%
Attend a meeting conducted in English	20.9%

Table F: Frequency Count of students who read different kinds of documents

Kinds of documents that they read in English	N=105	
	Number of students who read each document	Percentage of students who read each document
Emails	64	<b>60.9%</b>
Documents	27	25.7%
Reports (Test report, Log report, Bug report)	24	22.9%
Manuals	20	19%
Technical books, articles and forums	15	14.3%
Specifications (System spec, test spec, Program spec)	12	11.4%
Guidelines, user guides	10	9.5%
References on webs, references	7	6.7%
Web-sites, web pages	5	4.8%
User requirements	4	3.8%
Memos	4	3.8%
Proposals	3	2.9%
Instruction	3	2.9%
Training resources	2	1.9%
Agendas	2	1.9%
Minutes	2	1.9%

News, newspapers	1	1%
Presentation slides	1	1%
Ordinances or policies	1	1%
System analysis and design documents	1	1%
Help books	1	1%
Handover list	1	1%
Blogs	1	1%
Notices	--	--
Technical review	--	--
Tests	--	--

Table G: Frequency Count of students who wrote different kinds of documents

Kinds of documents that they wrote in English	N=105	
	Number of students who wrote each document	Percentage of students who wrote each document
Emails	82	<b>78.1%</b>
Reports (test reports, weekly working reports, work programs reports, placement reports, evaluation reports, software development life cycle reports, bug reports, error reports, pilot reports)	49	46.7%
Documents (documentation, handover documents)	13	12.4%
Manual (user manual, system manual)	13	12.4%
Specifications (test spec, function spec, system spec, program spec)	8	7.6%
Minutes	7	6.7%
User guide, guidelines	6	5.7%
Proposals	4	3.9%
Letters (request)	4	3.9%
Memos	3	2.8%
Agenda	2	1.9%
Code	2	1.9%
Logo	2	1.9%
Test plan	1	1%
Notes	1	1%
Presentation slides	1	1%
Instructions	--	--

Table H: Frequency count of the occasions on which the students needed to speak in English

Occasions on which the students needed to speak in English during their internship	N=105	
	Number of students who needed to speak in English on each occasion	Percentage of students who needed to speak in English on each occasion
Meeting	24	22.9%
Communication with native speaker colleagues and foreigners	15	14.3%
Phone talk	10	9.5%
User support	4	3.8%
Conference call with foreigners	2	1.9%
Speak with vendors	2	1.9%
Customers interfacing	2	1.9%
Communicate with a foreign company	1	1%
Online meeting with foreign users	1	1%
Onsite support to a foreign company	1	1%
Presentation to workmate	1	1%
Training lesson	1	1%
Small talks	1	1%
Order food during lunch	1	1%
Room booking	--	--



Table I: Frequency count of the occasions on which the students needed to listen to someone in English during their internship

Occasions on which the students needed to listen to someone in English	N=105	
	Number of students who listened in English on each occasion	Percentage of students who listened in English on each occasion
Meeting	30	28.6%
Seminars,talks, presentations	12	11.4%
Phone talk	12	11.4%
Communicate with foreign companies	7	6.7%
Talk with expatriate colleagues	4	3.8%
User support	4	3.8%
Conference call	3	2.9%
Communicate with foreigners	3	2.9%
Foreigners' question / enquiry	2	1.9%
Training lessons	2	1.9%
On-site support to a foreign company	1	1%
On-site meeting with foreigners	1	1%
Customers inter facing	1	1%
Discussing user requirements and system problems with the users	--	--
Video conferences with overseas office	--	--
Chatting	--	--