The Needs Analysis of ESP for Computer Majors

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Abstract. This paper examines the English needs of both computer practitioners and college students who are majoring in computers. Based on the results from 86 engineers and 346 college students as well as 14 university faculties, we discover that the following events are regarded as the most important ones by all groups of respondents including, familiarity of vocabulary for software programming and hardware, reading major-related articles and the ability to further learn major-related knowledge. The other communicative skills such as building good relationships with customers in English, reading and working with letters and meeting memos in English and making telephone calls in English are also deemed by the participants to be necessary and relatively important. Other communicative events which have been discussed in other related literatures are also studied and then instructional suggestions are given according to the investigation results.

Introduction

With the rapid pace of globalization in both economy and politics, the fast development of Information Industry is attaching unprecedented importance to people’s everyday life. Hence, the Chinese computer industry has to constantly strengthen its competitiveness in order to adapt to the lightning-fast changes around the world. And among the various components of an enterprise, the reservoir of human resources is inevitably the core strength of a successful company. Therefore, a large number of computer engineers with solid computer knowledge background, the qualified competence of international communication and bold innovative drive are of utmost importance in the Chinese corporation’s active participation of international competition. As is known to all, English has already become the most frequently-used language in world business communication as well as in other social aspects. What’s more, English is also the sole language of software and hardware operation in computer programs. Consequently, a good command of English, particularly the knowledge of English in professional fields is an advantageous plus for computer-related practitioners. However, in China the importance of ESP (English for Specific Purposes) has not achieved wide recognition. At the same time, seldom of the universities which have already offered ESP courses for computer majors has adopted the needs analysis (NA) before the opening of those courses. Therefore, a lot of problems emerged as a result of the shortage of needs analysis. For example, some students claim that the course of ESP is rather boring and useless, which means the class is not very well planned and organized with the content of the class being quite impractical and irrelevant to the students’ needs. Due to the aforementioned shortages, some universities even decide to cancel the ESP course for computer students after offering this course for several years. All these problems derive from the lack of thorough needs analysis as a necessary preparation before the offering of such ESP courses. What’s more, the research of workplace English used by engineers is even more scarce in China. Since the purpose of education is to prepare the students for their future career. And if the ESP course does not target the needs of computer employees, it will not become successful. Consequently, there is an urgent need to exam the usage of English in workplace so that course designers can identify the true needs and provide proper courses for computer majors on
campus. According to some scholars [1, 2], a successful ESP course depends heavily on the careful and objective needs analysis ahead of time. Only in this way, can the course designers and teachers understand the true needs of the students and the relevant practitioners so that they set appropriate goals, carry the most effective teaching method and select the most authentic teaching material to better equipped the students for their future careers.

Organization of the Text

Literature Review

Through years of study, researchers have developed many influential models of NA which can mainly be dichotomized into either target situation analysis or present situation analysis. For instance, the sociolinguistic model proposed by Munby [3] mainly focused on “target situations”. This model can help the course designer find out the specific language needs in the target situation, but it did not include political, administrative, pedagogic and methodological factors. In addition, Richterich & Chancerel [4] proposed a systemic approach, which can be grouped into the present situation category. Hence, the emergent nature of learner needs was also taken into account. Learner needs are approached by examining information before a course starts as well as during the course [5]. Richterich & Chancerel [4] recommended using more than one or two data collection methods for needs analysis such as surveys, interviews and attitude scales. In order to shift people’s attention from language needs to learner needs, Hutchinson & Waters [6] offered an often-cited learning-centered approach. They approached learners’ needs from two aspects: target needs and learning needs. The target needs was broken down into necessities, lacks and wants. The learning needs, on the other hand, referred to the learners’ social ethnographic information, knowledge background and attitudes toward English etc. Similar to the systemic approach, they also advocated constant check of needs analysis and multiple method of data collection. Another prominent model is proposed by Berwick [7] and Brindley [8], which was named learner-centered approach. Aside from language needs, learner’s attitudes and feelings are highlighted in this model. Long [9] in the current of task-based instruction perceived the importance of tasks analysis in NA. In this approach, tasks are the units of analysis and real-world task or the target tasks are supposed to be collected. This task-based paradigm is homogeneous compared with the communicative events as defined by Munby [3]. Generally speaking, in an authentic needs analysis the researchers are supposed to give equal importance to the communicative needs and learning needs and adopt multiple perspectives in order to guarantee the objectivity of the analysis. As for the data collection method, multiple methods should be employed to triangulate the research results.

Based on the aforementioned theory, this research is approaching the needs of computer majors concerning their workplace English skills from two aspects, namely the target situation analysis and the present situation analysis. The target situation analysis is mainly about the needs of IT practitioners in the workplace, while the present needs analysis mainly originates from the data collected from the university students majoring in computer-related subjects. In recent years, many relevant analyses of English needs for engineers in the workplace have been conducted which can be grouped into the target situation analysis [10-14]. All the data collected from relevant industry have provided us valuable insights into the actual target community and helped us to realize the need to conduct constant and up-dated survey analyses to prepare the students for the ever-changing world of professionals. In addition, we will also carry out research among the university students majoring in computers to investigate their learning needs from the perspective of lacks, wants and necessities so that the course can also cater the students’ needs and arouse their interests.
Methodology

A. Triangulation.

As has been used by many researchers, this study also adopts triangulation, which has been widely recommended in other needs analysis as the major research method. According to Long (2005) in triangulation of needs analysis, the data should be elicited at least from the following sources, including the learners, linguists and professional workers and embrace as much information as possible. Particularly, by considering different attitudes, the researcher can identify the most valuable needs and get rid of the insignificant ones.

B. Research Questions for example.

Based on our research objectives, we raise the following question:

Which workplace communicative events and skills are necessary and needed by both the computer practitioners and college students?

C. Participants, instruments and procedures.

In the first round, we interviewed 6 computer majors from three universities, a college teacher in a polytechnic university and two employees in two different computer companies. Among the six students three of them have already studied ESP and three of them have not. To our surprise, the three students who have studied ESP did not attach great importance to the study of this course. They felt that their ESP courses were rather boring, useless and irrelevant to their current study of major-related subjects and future careers. However, the other three students believed that ESP course can be necessary and valuable to both their current study and future development. As for the teacher, he also feels that ESP course is useful and necessary, but he is concerned the lack of qualified teachers, the obscure course aims in course design and the lack of interests for students to the ESP course. On the other hand, the two employees all unanimously agree that the ESP course for computer majors is both essential and significant. One of them, who works for a famous private software company in China as a program leader in R&D session emphasized the importance of vocabulary and reading capacity as well as reading speed, because their customers are mainly Chinese, and they do not need to use English in their daily communication. But they do need to read English articles in order to adapt to the quick change in IT industry. The other program manager who works in a leading multinational company, however, accentuated the strong ability of listening and speaking. According to him, a good command of oral and listening skills of English is a very competitive strength in their company and guarantees a prosperous future in career development for any computer engineers. According to him the good communication capacity in English assumes equal importance to strong professional knowledge. Then all the respondents’ constructive suggestions are considered in the designing of the questionnaire for the second round. In the next step, four different questionnaires were developed according to the relevant literature and feedback from the aforementioned interviews. As is suggested in the relevant literature, it could be said that engineers face a dual role in their English needs: not only are they required to read and write engineering related materials in English and communicate orally in English, but these same skills appear to cross-over into the Business English field as well. Therefore, in the questionnaires the communicative events and skills which have been studied in relevant literature are tested. It should be noted that the main body of the questionnaires were tracked with a Likert-type scale. 171 college students in a polytechnic university who have not taken the ESP course and another 175 college students from 4 Chinese universities who have already studies ESP answered two separate questionnaires specifically designed for them. 86 computer practitioners from different companies located in China responded to another version of the questionnaire mainly concerns their daily use of English. At last, 14 universities teachers who specialized in computer-related concerns their daily use of English. They also filled up the questionnaires including questions similar to the ones assigned to both the students and the engineers. Consequently, there are many overlapping questions in the four different questionnaires so that we can perceive the same question from different angles.
**D. Data Analysis.**

Data from the respondents were analyzed both quantitatively and qualitatively for the survey questionnaires and interview responses, respectively. For the quantitative analysis, all the data were input into computer. SPSS11.5 was used for the statistical analysis of the data. Descriptive statistics was employed to identify the respondents’ attitudes and differences.

**Results and Discussions**

Since there is a large number of questions surveyed in this project, this paper will simply report part of the results of the whole program with the focus on workplace English usage.

As is indicated in table 1, students’ needs for all the eleven communicative events are quite strong, because all the means are above 3.5. Particularly, students who have not taken ESP course want to master all the skills eagerly with all the means on these questions above 4. When being asked whether these events are necessary for the students to grasp, their answers are unanimously affirmative with the lowest mean being 3.68 and the highest mean 4.35. Among these events the means of four events have relatively high means compared with other activities by both the students who have taken the ESP and those who have not. It means that these activities are perceived by students to be of utmost importance. The events are the familiarity with English vocabulary in both programming and hardware and the ability to read major-related articles as well as further learning of major-related knowledge. This also coincides with the engineers answers, on which the engineers’ score of responses are all above 4. In addition, teachers who specialize in computer-related majors also score high on these events with all the means on these questions being over 4. It is quite obvious that all these skills will affect the computer engineers works to a large extent and can be called core skills for computer experts.

Table 1. The mean of tasks involving English usage.

| Communicative events                                          | Necessity (Mean) | Want (Mean) | Lack (Mean) | Engineers (Mean) | Teachers (Mean) |
|---------------------------------------------------------------|------------------|-------------|-------------|------------------|-----------------|
| Listen to major-related lectures in English                   | 3.73             | 3.70        | 4.26        | 3.86             | 4.12            | 3.86            | 3.51            | 4.43            |
| English Oral presentation on a working project                 | 3.85             | 3.76        | 4.11        | 4.16             | 4.14            | 3.87            | 3.28            | 3.93            |
| Telephone in English                                          | 3.96             | 3.76        | 4.21        | 3.68             | 3.99            | 3.84            | 3.30            | 3.79            |
| Read major-related articles in English                        | 4.06             | 3.85        | 4.32        | 3.80             | 4.00            | 3.92            | 4.17            | 4.86            |
| Read and work with letters and meeting memos in English       | 3.97             | 3.74        | 4.15        | 3.93             | 4.11            | 3.91            | 3.64            | 4.14            |
| Read and Write program report in English                      | 3.92             | 3.68        | 4.08        | 3.79             | 4.02            | 3.91            | 3.26            | 3.79            |
| Write research report in English                              | 3.80             | 3.69        | 4.01        | 3.79             | 3.99            | 4.04            | 3.13            | 3.93            |
| Build good relationships with foreign customers                | 3.95             | 3.82        | 4.20        | 4.00             | 4.04            | 4.07            | 3.57            | 3.93            |
| To further learn major-related knowledge in English            | 4.08             | 3.84        | 4.26        | 3.82             | 4.03            | 3.84            | 4.13            | 4.43            |
| Be familiar with English vocabularies in programming           | 4.35             | 3.93        | 4.43        | 3.85             | 3.67            | 3.96            | 4.35            | 4.21            |
| Be familiar with English vocabularies of hardware              | 4.28             | 3.79        | 4.29        | 3.70             | 3.69            | 3.89            | 4.13            | 4.43            |

Note: 1=students who haven’t studied ESP; 2=students who have studied ESP
Therefore, it is reasonable that the teaching of these four skills should be put on top of the priority list in the ESP course for computer majors. While designing ESP course for computer majors these skills are supposed to be practiced with repeatedly. According to the importance as judged by students’ perception of necessities, the second category of events include building good relationships with foreign customers, reading and working with letters and meeting memos in English and telephone. Viewing from the perspective of the engineers, these events can also be grouped into the second class according to the importance. But teachers do not seem to attach great importance to the events of building good relationships with foreign customers and telephone. This is because most of the faculties don’t have the real business working experience. So they may underestimate the importance of relationship-building in the business world and communication skills in telephone. According to Pappas and Hendricks [16], however, engineering faculty members have been hesitant to teach written and spoken communication not because they fail to recognize their importance but because they are not trained to teach and evaluate these. The result again tells that needs analysis from multiple angles can be very important in getting rid of bias in course design. And course designers, especially teachers should realize their lack of due attention on business English for interpersonal communication while planning for the ESP courses for computer majors. Anyway, all the graduates will eventually enter the real business world to test their working capacities including their ESP knowledge. As for the other activities, comparatively speaking, students do not take listening ability of major-related lectures as necessary as other events, but both engineers and teachers score relatively high on this event, which should arouse students’ attention on it. Major-related lectures are quite useful and effective ways for students to acquire knowledge. But in China, the limited number of authentic lectures on computer in English undermined students’ needs for this event. In the process of globalization, university administers should create better academic environment for the college students to provide them with more internationalized lectures to widen their horizons. And students should also pay more effort in cultivating their abilities of listening to lectures. Another event, which has achieved relatively less attention, is writing research report. This corresponds with the research of Kaneko et al. [14]. All the three groups of participants, namely the students, the engineers and the teachers score low on this event compared with the other questions. This is because compared with graduate students whose focuses are researches, undergraduates are often not asked to carry out too much complicated academic works. Hence, presenting research report in English is not the most urgent skill that students are supposed to grasp. The other two activities which are related to program report do not seem to be as important as the other activities by different groups of participants. The reason for this might be the nature of computer programs. Usually, computer programs are completely by teamwork. Hence, only the program leaders are responsible for the report both in written and in spoken form. It does not seem to be a critical ability that every computer engineers should possess.

**Conclusion**

This research presented a characterization of the relevant tasks of computer engineers requiring English and the needs of college students for those English skills. An outline of the role that English plays in the real business world in computer companies was offered through the exploration of the general English situation, followed by a more focused examination of the specific tasks carried out in the form of English. Besides, the computer major students’ needs are also provided in terms of necessities, wants and lacks. Since such research is rather scarce in China mainland, it is believed that the findings of this research can clarify the confusions and eliminate bias in the process of course design and provide conclusive suggestions in both the instruction and selection of teaching materials. To this end, course designers and instructors should consider placing English training emphasis on all four core English skills, with further modularized training in particular areas such as specialized vocabulary and business English to fully equipped college students in computer majors for their future careers.
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