Article

Designing English for Specific Purposes Course for Computer Science Students

Isra Irshad
University of Gujrat, Pakistan
isra.irshad@uog.edu.pk

Behzad Anwar
University of Gujrat, Pakistan
behzad.anwar@uog.edu.pk

Abstract

The aim of this study was to design English for Academic Purposes (EAP) course for University students enrolled in the Computer Science Department. For this purpose, academic English language needs of the students were analyzed by using a 5 point Likert scale questionnaire. Additionally, interviews were also conducted with four faculty members of the department and the data were analyzed qualitatively. Thus, mixed methods were used for collection and analyses of data. The results of the analysis of questionnaire and interviews indicate that the four language skills, namely listening, speaking, reading and writing are frequently used in students' academic context and among the four, speaking is the most frequently used skill. Students are deficient in writing and speaking skills as compared to listening and reading; therefore, speaking and writing should be given preference while designing the syllabus.

Keywords: English for Academic Purpose, English for Specific Purpose, needs analysis, syllabus design

Introduction

In the present age, no one can deny the importance of English language. It is used all over the world as a second and foreign language in non-native context (Kachru, 1983). The demand of English for Academic Purposes (EAP) is increasing not only in those countries where English is used as a mother tongue, but also in many other countries where the students have to adopt English as a medium

of instruction for higher education (Jordon, 1997). It is vital to develop texts in students' particular disciplines so that they are able to perform various tasks in the contexts of their disciplines, for instance, note-taking during lectures and reading texts specific to their field (Dudley-Evans & St. John, 1998). Due to globalization, English has become the language of science and technology and mostly the literature of scientific studies is written in English. Therefore, it is the need of the hour to acquire competence in the English language to cope up with the real challenges of the modern era. In Pakistan, English is the medium of instruction at higher level, and the Universities are no exception. Students need to learn English in most of the academic tasks, for example, to give presentations, to prepare assignments, to participate in class and other academic related tasks. Since the students of computer science department have to design software installation guides, software manuals for project presentations, their learning demands of English are different from the students of other departments. Thus, for the present study, the researchers designed an EAP course for the students of computer science, first semester, after doing needs analysis of the students.

The objectives of the research are as following:

1. To analyze the EAP needs of the students of computer science
2. To design an EAP syllabus for the students of computer science

Literature Review

English for Specific Purposes (ESP) is a branch of English as a Second Language (ESL)/English as a Foreign Language (EFL), which are the main branches of English language teaching. It can be said that ELT is an umbrella term which subsumes ESL and EFL. Among them, ESL is further subdivided into sub-branches, namely English for General Purposes (EGP) and English for Specific Purposes (ESP) (Robinson, 1991). Discussing the concept of ESP, Widdowson, 1984 (as cited in Alharby, 2005) states, "If a group of learners' needs can be accurately specified, then this specification can be used to determine the context of a language program that will meet these needs" (p. 10).

According to Flowerdew and Peacock (2001), ESP consists of two branches: the first one is EAP and the other is English for Occupational Purposes (EOP). The

distinction between EAP and EOP is not clear, because whatever the students learn in university is actually a preparation of professional occupation they have to face after completing their education and can also be classified as EOP, for example, English for Business. Different aspects which are designed in their course would be EAP, but these courses will prepare them for business career; therefore, in the present study, course/syllabus was designed for computer science students for academic purposes.

Widdowson (1984) describes syllabus as "A framework within which activities can be carried: a teaching device to facilitate learning" (p. 26). Furthermore, Widdowson (1987) defines it as the specification of teaching program or a pedagogic document which defines a particular group of learners because of the peculiarities. Nunan (1984) quotes the ideas of Breen (1984) who is of the view that syllabus includes assumptions about the psychological process of learning, assumption about language and about the social and pedagogic process within a classroom. Nunan (1984) highlights that syllabus design is seen as being concerned essentially with the selection and grading of content. In order to design a syllabus for students of computer science, it is important to have an understanding of different types of syllabi. There are basically two types of syllabi: one is process-oriented and the other is product-oriented. Nunan (1984) states that process oriented means a series of actions that the students do in the classroom, related to language learning. Such types of syllabi focus on learning experiences. The product syllabus on the other hand, focuses on the end itself.

Brown (1995) classifies syllabus into structural, situational, topical, functional, skill-based and task-based. The focus of structural syllabus is on grammatical forms, whereas the situational syllabus is based on common situations and contexts. Topical syllabus is similar to situational syllabus, but the only difference between this syllabus and previous one is that it is organized by topics and themes. Functional syllabus is organized around language functions; material is selected around academic skills in skill based syllabus; and the last one is task-based syllabus, which is based on a series of tasks or activities. Students are instructed through a series of tasks. Brown (1995) is of the view that it is not necessary to choose only one syllabus, but a combination of two or three syllabi working together is very useful.

Needs analysis

The notion of needs analysis is very important in course design because it provides the base for designing an EAP course. According to Iwai et al. (1999) needs analysis involves activities that are used to collect information and on the basis of this collected information, a curriculum is designed, which fulfills the needs regarding learning of a particular group of learners. On the other hand, informal needs analysis is not new and has been conducted by teachers to identify language features and students' needs. Formal needs analysis is new in the field of language teaching though. Johns (1999) states that needs analysis is the first step in course design. After Munby's publication (1978) of communicative syllabus design, needs analysis went through many stages. In the communicative syllabus design he has introduced the concept of Communication Needs Processor (CNP), which is actually a basis of this approach to needs analysis. After this, many terms have been introduced, for example target situation analysis, present situation analysis, pedagogic needs analysis and need analysis.

Dudley-Evans and St. John (1998) describe the concepts about needs analysis using the following diagram:

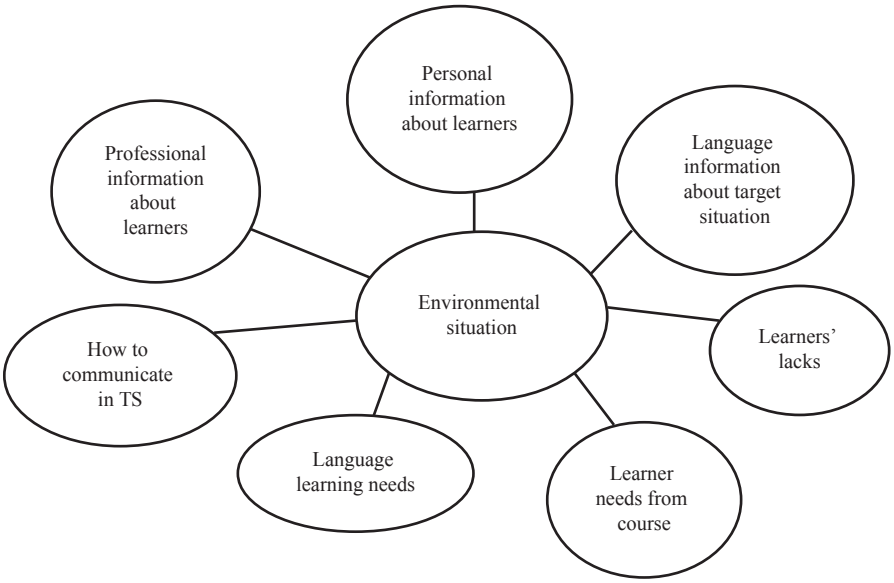

Figure 1. Needs analysis-Source: Dudley Evans and St. John (1998)

According to them, the following concepts should be included in the need analysis.

1. Professional information about the learners
2. Personal information about learners
3. English language information about the learners
4. Language learning information
5. Professional communication information about the learners
6. What is wanted from the course
7. Knowledge of how language and skills are used in the target situation-linguistic analysis, discourse analysis, genre analysis

Target Situation Analysis (TSA) and Present Situation Analysis (PSA) are very significant notions in conducting needs analysis. Target Situation Analysis was introduced by Chamber (1980), which focuses on the language requirements of the learners at academic and occupational purposes (West, 1998). A needs analysis which focuses on learners' needs at the end of a language course is called TSA. According to Robinson (1991) and Jordon (1997), PSA is a complement to TSA in which it focuses on what the learner will be able to do at the end of the course. In PSA, the focus in on identifying what the learners' proficiency level is at the beginning of the course. Dudley-Evans and St. John (1998) define PSA as "an analysis that estimates strengths and weaknesses in language skills and learning experience" (p. 125). In other words, if we want to establish the destination point of the learner, we must have awareness about the starting point. The term PSA was introduced by Richterich and Chancerel (1980). Jordan (1997) states that we can get data or information about the learners from the learners themselves, from teaching establishment and from the institution and the place of work. PSA can be determined using placement tests; however, the background information provides enough data about the present language abilities of the learners.

Deficiency analysis is another very important aspect of needs analysis. In ESP domains, it describes the route or way that learners have to cover from point A (present situation) to point B (target situation). According to Jordon (1997), deficiency analysis is very important because it forms the basis to design the

language syllabus; therefore, the role of needs analysis is very special in syllabus design, because through needs analysis, the syllabus designers identify the goals and objectives of their course (Hutchinson & Water, 1987). Objectives and goals indicate what the students are supposed to master along the process. Brown (1995) states that goals must be accomplished in order to satisfy the students' needs previously identified.

Methodology

In the present study, the researchers have used the selected part of the model of needs analysis given by Dudley-Evans and St. John (1998). The following points are kept in mind while doing needs analysis of the students of computer science:

1. Professional information about the learners: It is basically TSA which is an academic situation of the students in this context. Thus, the researchers focused on those tasks in which students have to use English.
2. Present Situation Analysis entails comprehending current language skills of learners.
3. Identifying the gap between TSA and PSA.

In order to analyze the academic English language needs and deficiencies, both qualitative and quantitative research methodologies were used. Robinson (1991) lists a number of methods for conducting needs analysis, including interviews, questionnaires, tests, authentic data and case studies. For the present study, the researchers devised a questionnaire for students and conducted interviews with faculty members of the Computer Science Department. The questionnaires were filled by 30 university students of 7th semester from the Department of Computer Science in the Punjab. The reason for the selection of these students was that they had a good knowledge of the language skills required in their academic context. In the questionnaire, the first question was asked about the students' medium of instruction in the last institution. In the second part, question number 1-23 were regarding reading, speaking, writing and listening skills. The purpose was to get information about the frequency of using these language skills in their academic domain. The third part (questions 24-46) was devised to get information about the ability of students in using these skills. In addition to that, the researchers interviewed four faculty members of the department. The interviews were unstructured and

consisted of random questions which were asked in a relaxed environment of the faculty rooms. All the faculty members were co-operative and presented their perspectives logically and honestly.

Data Analysis

The most frequently used academic skill is speaking as is clear from the below mentioned information in Tables 1, 2 and 3. The mean value of speaking skill is 4.6400; the second skill which is used frequently is listening skill and the mean value is 4.5000. The mean values of reading and writing are 4.4500 and 4.0095 respectively, which are closer to listening; whereas, the ability of the students in using these skills shows the mean values of 3.9400, 3.7444, 2.5333, 2.5067 for listening, reading, writing and speaking respectively. This shows that they are more competent in listening and reading skills as compared to writing and speaking.

Table 1
Frequency of Using 4 Language Skills in Students' Academic Domain

	N	*Mean*
Reading	30	4.4500
Writing	30	4.0095
Speaking	30	4.6400
Listening	30	4.5000

Table 2
Ability of Students in Using 4 Language Skills in their Academic Domain

	N	***Mean***
Reading	30	3.7444
Writing	30	2.5333
Speaking	30	2.5067
Listening	30	3.9400

Table 3
Deficiency of Students in Using Language Skills in Academic Domain

	Mean Values (Table 1)	***Mean Values (Table 2)***	***Mean Values (Table 1)-(Table 2) = lacks***
Reading	4.4500	3.7444	0.7056
Writing	4.0095	2.5333	1.4762
Speaking	4.6400	2.5067	2.1333
Listening	4.5000	3.9400	0.56

In order to know the deficiencies of the students, the researchers subtracted the mean values of reading, writing, speaking and listening (which show the ability of the students in using these language skills (Table 2) from mean values of reading, writing, speaking, listening (which show the frequency of using these skills in academic context, Table 1) respectively. The result shows that the students' deficiency in speaking skill is greater (2.1333); whereas, deficiencies in writing, reading and listening are 1.4762, 0.7056 and 0.56 respectively. This information shows speaking and writing should be given more emphasis when designing EAP course.

The mean value of each question is analyzed in part 2 and part 3, then mean value of questions 1-23 is subtracted from the mean value of questions 24-44 respectively as depicted in the Table 6 (see Appendix). For example, (Q1-Q24), (Q2-Q25), (Q3-Q26) and so on till (Q23-Q46). The purpose of analyzing the data in this manner was to know the students' lack in each task regarding language skills. The tasks in the reading skills are frequently used in their academic context, for example, they have to read software manuals, material on internet, notes given by teachers, articles, technical journals, computer science textbooks, as the mean values of questions 1 to 6 in Table 4 (see Appendix) are indicating and their ability in performing reading tasks is good. This is because it indicates that they are more proficient in reading, for example, 0.87, 0.96, 0.9, 0.67, 0.24, 0.6 are mean values of their lacks in reading tasks. They are not evaluated on the basis of their reading skill and they find themselves at a good position in the use of this skill. The mean

values of writing tasks are 3.07, 3.27, 4.73, 4.50, 4.57, 4.50, 3.34 as present in Table 4 (questions 7 to 13), and their lacks in writing tasks are 0.1, 0.84, 2.2, 2.13, 2.24, 2.2, 0.54, as depict in the table no.6, include writing technical reports, formal letters, assignments, computer science articles, software installation guide, software manuals, C.V. This illustrates that three tasks are less frequently used in their academic life. These include writing technical reports, formal letters and CV writing. These tasks have less mean values, for example, 3.07, 3.27, 3.34 are less as compared to the rest of the tasks. It seems that the students have overstated their writing ability in performing these tasks and have taken all three tasks of writing skills for granted because these tasks are less required in academic context. On the other hand, there is a need to improve their writing skill in other tasks, for example writing assignment, computer science articles, software installation guide and software manuals etc. They make numerous mistakes while completing different tasks. However, this skill can further be improved by giving them the different writing tasks.

Analyzing questions 14 to 18 from Table 4 and 37 to 41 from Table 5 (see Appendix A) and the students' lack in these tasks from Table 6, give a very sad picture of students' proficiency in speaking skills. The data tell us that they have to speak in English in seminar, group discussions and project presentations a great deal as the mean value of questions 14-18 of these tasks is 4.37, 4.83, 4.93, 4.5, 4.53, but they have enormous lack in these skills. For example, 1.8, 2.36, 2.53, 2.23, 1.73, 1 (the mean values of lacks is present in Table 6). Mostly, the students from Urdu medium background face difficulty in learning speaking skill because this skill is not evaluated in Urdu medium schools. They are not habitual of using this skill in the academic setting and hence must be encouraged to speak in the classroom setting to excel in their academic and professional fields.

Analyzing questions 19 to 23 from Table 4 and questions 37 to 41 from Table 5 and the students' lack in these tasks from Table 6 show that students have to use academic listening tasks a great deal as the mean value of questions 19 to 23 is 4.53, 4.57, 4.73, 4.20, 2.47 and they perform the listening tasks given to them quite well-1, 0.54, 0.7, 0.2, 0.37. They lack listening skills in presentations, group discussions, teachers' lectures, seminars and projects. Their listening skill must be judged and evaluated on regular basis in order to make them conscious as such a check will help them to improve their listening skill.

The first question in the questionnaire is about the students' medium of instruction in the last institution. The result depicts that about the 70% have come from Urdu medium institutions and only 30% students come from English medium institutions. The purpose of asking this question was to know about the students' background and environment of learning English language.

The researchers also interviewed four faculty members of Computer Science Department. Questions in the interviews were based on the four skills as they frequently use in the academic life of students. All the teachers were of the view that writing and speaking are the most important skills in the students' academic life, but they also emphasized the inclusion of reading and listening skills in the EAP course. They were not satisfied with the students' ability in all language skills and opined that the four language skills must be included in the course, but emphasis should be given to writing and speaking skills. They said that their students were poor in grammar and lacked technical vocabulary. They placed their students' ability in speaking and writing skills at a very low level and emphasized the improvement in the use of these skills as they have to designing software manuals, software installation guides and project presentations.

Discussion

It appears from the data that the computer science students of the university mostly come from Urdu medium schools (70%), where English is taught through deductive approach with little emphasis on communicative and spoken skills (Alam & Bashir, 2013); therefore, they are not well-versed in the speaking skill and thus face difficulty in communicating in English. The data show that all four skills, especially speaking, are frequently used in academic context as reported by teachers and students. According to the information given by students in the questionnaire, they are more deficient in writing and speaking skills as compared to listening and reading skills. Moreover, it seems that the teachers are not satisfied with the students' ability in all four skills. ESP teachers can investigate the objectives from the learner's point of view (Sierocka, 2008). In this study the teachers have also emphasized the inclusion of writing and speaking skills in the syllabus. This is what Crocker (1981) believes in when he talks about the role of a teacher from a methodological point of view. Apart from this, they are also dissatisfied with the students' confidence level and their ability to use grammar; therefore, it is suggested that students should learn according to their personal needs. This gives them

an opportunity to acquire the desired skills in a speed up and intensive context (Wright, 1992).

Nisar (2016) conducted a study to examine English language needs of undergraduate female students in the field of computer science and the results were in harmony with the present study. The study specifically focused on the difficulties faced by the students in reading, writing, speaking and listening in English language for academic purposes. It was concluded that the needs of computer science students were more tilted towards teachers focusing more on speaking and writing skills in the English language classrooms.

Conclusion

Thus, it can be determined that there is a need to develop an EAP course which includes tasks related to all four language skills, but speaking and writing tasks should be given more emphasis. Technical vocabulary should also be included in the course for enhancing students' competence. A combination of different types of syllabi (task based syllabus, structural and skills based syllabus) would be useful in order to design a comprehensive course/syllabus for the students of Computer Science studying at university level. A combination of process and product oriented syllabus is suitable in order to teach the students of computer sciences as they would get the advantage of experiencing the process as well as the product of learning. Keeping this in view, the researchers should design a syllabus including aspects of structural syllabus and task/activities. At this level in the university, mostly task based syllabi are preferred, but keeping in mind the poor language learning background of the students, structural syllabi should also be recommended.

References

Alharby, M. (2005). *ESP target situation need analysis: The English language communicative needs as perceived by professionals in Riyadh.* Unpublished Ph.D. Thesis. The University of Georgia, USA.

Alam, Q., & Bashir Uddin, A. (2013). Improving English oral communication skills of Pakistani public school's students. *International Journal of English Language Teaching, l.1*(2), 17-36.

Breen, M. P. (1984). Process syllabuses for the language classroom. In C. J. Brumfit (Ed.), *General English syllabus design.* (pp. 47-60). London: Pergamon Press & The British Council.

Brown, J. D. (1995). *The elements of language curriculum: A systematic approach to program development*. Boston: Heinle and Heinle.

Crocker, T. (1981), Scenes of endless science: ESP and education. The ESP teacher: Role, development and prospects. *ELT Documents, 112*, 7-15.

Dudley-Evans, T., & St, John. M.-J. (1998). *Developments in ESP: A multi-disciplinary approach*. Cambridge: Cambridge University Press.

Flowerdew, J., & Peacock, M. (2001). Issues in E. A. P.: A preliminary perspective. In J. Flowerdew, & M. Peacock, (Eds*.), Research perspectives on English for academic purposes.* Cambridge: Cambridge University Press.

Iwai, T., Kondo, K., Limm, S. J. D., Ray, E.G., Shimizu., & Brown, J. D. (1999). *Japanese language needs analysis*. Retrieved from http://www.nflrc.hawaii.edu/Networks/NW13/NW13.pdf

Johns, A. (1999). English for specific purposes: Its history and contribution. In Celce-Murcia, M. (Ed.). *Teaching English as a second or foreign language* (pp.67-77). Boston: Heinle & Heinle.

Jordan, R. R. (1997). *English for academic purposes: A guide and resource book for teachers*. Cambridge: Cambridge University Press.

Kachru, B. B. (1983). *The Indianization of English: The English language in India*. New Delhi: Oxford University Press.

Munby, J. (1978). *Communicative syllabus design*. Cambridge: Cambridge University Press.

Nisar, S. (2016). *The present English language needs of computer science undergraduates: Case study in International Islamic University, Islamabad.* Department of English, International Islamic University, Islamabad.

Nunan, D. (1984). *Syllabus design: A scheme for teacher education.* London: Oxford University Press.

Richterich, R., & Chancerel, J. (1980). *Identifying the needs of adults learning a foreign language*. Oxford: Pergamon Press.

Sierocka, H. (2008). The role of the ESP Teacher. *Business English, 2*(56), 33-37.

West, R. (1998). Needs analysis in language teaching. *Language Teaching*, *27*, 19.

Widdowson, H.G. (1984). *Learning purpose and language use*. Oxford: Oxford University Press.

Wright, C. (1992) Article: The benefits of ESP. *Camlang.com*. Retrieved from http://www.camlang.com/art001.htm

Widdowson, H.G. (1987). *Aspect of language teaching*. Oxford: OUP.

APPENDIX A

Table 1
Frequency of Using 4 Language Skills in Students' Academic Domain

	N	***Mean***
Reading	30	4.4500
Writing	30	4.0095
Speaking	30	4.6400
Listening	30	4.5000

Table 2
Ability of Students in Using 4 Language Skills in their Academic Domain

	N	***Mean***
Reading	30	3.7444
Writing	30	2.5333
Speaking	30	2.5067
Listening	30	3.9400

Table 3
Deficiency of Students in Using Language Skills in Academic Domain

	Mean Values (Table 1)	***Mean Values (Table 2)***	***Mean Values (Table 1)-(Table 2) = lacks***
Reading	4.4500	3.7444	0.7056
Writing	4.0095	2.5333	1.4762
Speaking	4.6400	2.5067	2.1333
Listening	4.5000	3.9400	0.56

APPENDIX B

Proposed Syllabus for University Students

Course Code:	Course Title: EAP for Computer Science
Year:2015	Semester: Fall-2015
Instructor's Name:	Office (Room No):
E-mail:	Office Hours:

Course Contents	• Clear and effective presentations • Types of sentence Structure • Writing research article • Grammar (will be taught inductively) • Technical Vocabulary • Skimming and scanning • Group discussions • Listening activities • Role plays
Course Type: (Compulsory / Core / Elective)	Core
Goals	After completing the course the students will achieve the following goals: 1. They would be able to get the command of four basic language skills, particularly speaking and writing skills. 2. They would become expert in the use of the imperative and interrogative structures of the sentences. 3. They would become confident presenters and can actively participate in discussions regarding their field in academic context. 4. They would understand and grasp the technical vocabulary. 5. They would become expert in writing research articles. 6. They would get good insight of grammar.

References books	A Communicative Grammar of English by G. Leech & J. Svartik. Grammar in use by Raymond Murphy Teaching Grammar: Form, Function and Technique by McKay, Sandra
Lectures	32 sessions of 90 minutes each
Attendance Policy	A minimum of 70% attendance is required for a student to be eligible to take the final examination.
Grading	The course will be evaluated on the basis of the following percentage: Mid Term 25 Sessional work 35 5 marks for quiz 10 marks for speaking activities including presentations 10 marks for assignment 10 marks for writing activities Final term 40

Session Schedule

Session	Topic
1&2	Introduction to communication Oral versus written communication
3&4	Introduction to grammar and parts of speech
5&6	Activity of listening and role plays
7&8	Skimming and scanning (technical and computer science texts are chosen for practice) + practice of few words of technical vocabulary (grid activity for teaching vocabulary)
9&10	Group discussions/role plays Activities of role playing in the classroom, e. g. to ask the student to give instructions to other group members in order to design particular software. Group discussions - Different topics, e.g. general and specific topics that have relevance with their subjects can be given to students in order to generate discussions among them.eg the role of computer in the modern world, traditional teaching versus computer-aided teaching and so on.
11&12	Practice of types of sentence structure + combination of sentences

13&14	Practice of types of sentence structure + practice of few words of technical vocabulary (vocabulary box activity)
15&16	Midterm examination
17&18	Improving writing techniques + practice of few words of technical vocabulary
19&20	Tenses (past, present & future)
	To get insight in the process of writing research paper
	7.1 What is research paper?
21&22	7.2 How to write a research paper?
	7.3 The process of writing a research paper?
	7.4 What is plagiarism?
23&24	Quiz + Active and passive voice
	How to alleviate fears when doing a presentation
25&26	How to structure and prepare a presentation
	How to use your voice for effective communication
27&28	presentations +practice of few words of technical vocabulary
29&30	presentations+ practice of few words of technical vocabulary
31&32	Revision