A Study on Subject-Based English for College Students

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Subject-Based English is an important part in college English for non-English major students and an effective way to help them to complete the transition from language learning to its practical application. According to the requirement of Subject-Based English for college students from Educational Ministry Of China and the needs of the learners in their coming work, this paper approaches the development of teaching material, content of the courses, teaching model and teaching method by using the advanced EAP teaching theories of other countries for reference.

I. The Principles and Features of Teaching Material

We should study the subject-Based English teaching and develop the teaching material from overall view of language, which treats language as a system of symbols, a tool for communication, the dress of thought and the carrier of culture. The texts of teaching material should be compiled in simplifying, mixing and original sequence, whose prototypes should come from English original editions of newspapers, magazines, textbooks, theses, treatises, instruments, documents and other books. For example, if we compile the textbooks *English For Computer Science And Technology* for college students of computer major, we can design 30 units for the textbooks. The content list of them is as following:

Unit 1 Introduction to Computers, Unit 2 Computer Number System, Unit 3 Digital Circuits, Unit 4 Processors, Unit 5 Microprocessor Architecture, Unit 6 Memory, Unit 7 Memory Interfacing, Unit 8 Flowcharts, Unit 9 Data Transfer, Unit10 Multiprocessor System, Unit 11 Data Acquisition Systems, Unit 12 Serial Transmission, Unit 13 Interfacing, Unit 14 Computer Peripherals, Unit 15 Transducers, Unit 16 Computer Software, Unit 17 Programming Languages, Unit 18 Assembly Language Programming, Unit 19 High Level Language Programming, Unit 20 Operating System, Unit 21 Distributed Operating System, Unit 22 Microsoft Windows, Unit 23 Software Engineering, Unit 24 Software Quality Assurance, Unit 25 Data Management, Unit 26 Database Systems, Unit 27 Computer Simulation, Unit 28 Artificial Intelligence, Unit 29 Computer-aided Design, Unit 30 Knowledge: General Concept.

In each unit, there is a certain theme around which the texts are compiled and training activities for listening, speaking, reading writing and translation skills are designed

II. The Contents of Courses and Types of Training Activities

About systematic knowledge of subject-based English, there are three kinds of exercises. The first one is about subject-based English words, phrases and sentence structures. The second one is a series of exercises to improve learners’ integrated language applying ability. The last one is a set of activities to develop the learners’ communicative ability in subject English. As for Listening training, speaking training, reading training, writing training and translation training, there are systems of listening, speaking, reading, writing and translation skills for subject-based English. The correlative exercises and activities follow each skill introduction in every unit in order to improve learners’ all-round skills and integrated language applying ability. The following is the exercises and training activities for one unit of *English For Computer Science And Technology*. The theme of this unit is on...
Distributed Operating System. Its text includes three passages, whose titles are (1) What is a Distributed Operating System, (2) Advantages of Distributed Systems over Centralized Systems, (3) Hardware Concepts. Its exercises and training activities are designed around the theme of Distributed Operating System and classified into the following six parts.

**Part I. Exercises and Training Activities of Language Study**

**I. Fill in the blanks with the proper forms of the following verbs or verb phrases.**

- harness, denote, hold, bring down, compensate, wreak, prosper, allocate, execute, operate

1. Because of the breakdown of the network, all of the computers must ______- separately.
2. This courseware is developed to ______ either on a single computer or on a network.
3. If you could ______ your energy, you would have accomplished a great deal.
4. The wooden bridge failed to ______ and crashed into the river below.
5. We use the term “CPU” to ______ the most important part of a computer, the central processing unit.
6. By using Norton Crash Guard, single application failure will not ______ the whole machine, with other applications intact.
7. The newly developed Internet industry is ______ with each passing day.
8. The lack of anti-virus software can ______ havoc on the safety of the system.
9. Nothing can_______ for the loss of those important data that I stored on that floppy disk.
10. For the implementation of a specific task the computer can dynamically ______ its resource, such as a disk or a diskette file.

**II Translate the following expressions into English.**

1. 分布式系统
2. 推动力
3. 效能成本合算
4. 设计谱
5. 绝对性能
6. 阵列处理机
7. 程序计数器
8. 印刷电路板
9. 紧密耦合系统
10. 松散耦合系统

**III Fill in the following blanks with proper prepositions.**

1. ______ effect, a distributed system functions more efficiently than separate computers.
2. It makes sense to keep track _____ inventory at each store on a local computer.
3. The supervisor needs access ____ those important files of a system so as to make the system run smoothly.
4. Electronic mail has numerous advantages _____ paper mail, telephone, and FAX.
5. Windows, DOS, Linux and Unix fall ____ the same category: they are operating system.
6. We have defined software engineering as the technological disciplines concerned ___ systematic production and maintenance of software products.
7. Without an operating system, a computer can’t be counted ____ a functional one.
8. ____addition ____ the old 486 computer, we still have two more Pentium computers in our laboratory.
9. _____ lack _____ suitable information on hand, we have to search some on the Internet.
10. Those computers have been linked together to form a network, therefore they should be dealt with ____ a whole.

**IV Read the following passage carefully and fill in the blanks with the proper words selected from the**
list. Change their forms if necessary.

Nowadays, Internet is familiar to nearly everyone of us. But do you know the history of it? And have you found its usefulness?

Internet was originally funded by the Pentagon’s advanced Research Projects Agency, the Arpanet. It ___1___ university computers to military installations and allowed them to ___2___ data and electronic mail. Since the ___3___ of the World Wide Web in 1989, the Internet has grown exponentially.

The Internet, ___4___ other media such as TV or radio is inherently a “two-way” ___5___. The ease with which a computer user can___6___ to the rest of the world has created a sense of “global community”. People around the world post web sites, ___7___ email, and participate in online chats.

Going online means not just ___8____ the Web and reading email. It means getting involved __9__ the whole Net community.

The earliest Internet-based communication was email. Then came electronic bulletin ___10___.

While most people are assigned email __11__ through their ISPs, free accounts are ___12__ to anyone who has access to a web-ready computer. Mail allow users to __13___ their email anywhere they can launch a web browser.

With a web browser, you can ___14___ the web pages. There you can find large amount of useful information.

With the development of e-commerce, you can even buy goods at home. You can have them ___15___ to your house.

V. Summarize the advantages of distributed system over the centralized system in terms of economics, speed, reliability and incremental growth.

VI. Study the following chart carefully and write a short paragraph on the basis of the information given.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
</table>
| SISD | Single instruction stream  
Single data stream | Traditional uniprocessor |
| SIMD | Single instruction stream  
Multiple data stream | Some supercomputer |
| MISD | Multiple instruction stream  
Single data stream | No existing examples |
| MIMD | Multiple instruction stream  
Multiple data stream | All distributing systems |

VII. Give the definition of Distributed System by taking the network as an example.

Part II. Exercises and Training Activities of Reading Comprehension

I. Decide whether the following statements are true or false.

1. It is from 1985 that the computer became smaller and less expensive.
2. In spite of the decrease in size and price the computer’s computing power remains the same as the mainframe.
3. Just because of the lack of way of connection computers had to be operated independently.
4. The amount of improvement in the technology of computer is greater than that of any other industry.
5. The Internet can be regarded as a distributed system.
6. The WANs allow millions of computers all over the world connected at speeds of gigabits per second.
7. The Distributed System still can’t be defined exactly.
8. The advancement of the technology of Distributed System makes it easier to develop software.
9. The Distributed System can be thought of as a single processor.
10. If a system as a whole looked and acted like a classical single-processor time-sharing system, it counts as a centralized system.

II. Answer the following questions

1. When and where did the first computer to use the binary numbering system come into being?
2. Why did the computers have to work independently before mid-1980s?
3. What advances make it possible to connect the computers all over the world?
4. What is LANs? What is WANs (your answer should be more than 50 words)?
5. Why does the development of distributed system make the software programming more painstaking than before?
6. What are the two important advances in technology that make computers not so expensive or large as before and interconnected (your answer should be more than 50 words)?

Part III. Exercises and Training Activities of Listening Training

I. Listen carefully to the interview and fill in the blanks with the words you hear from the tape.

1. What is a distributed system?
   A distributed system is ____________ or processes that communicate with each other and appears to users as ____________.
2. What is the main aim when a distributed system is designed?
   In designing a distributed computing system, the main aim is to provide the users with a system that ____________, ___________, and increased potential for resource and ____________.
3. What is most important factor in the design of a distributed system?
   The main issues in the design process are ____________ of the databases, ____________, query processing, and ____________.

Part IV. Exercises and Training Activities of Speaking Training

I. Try to give a definition of distributed system orally by using the speaking technique of emphasis.

Part V. Exercises and Training Activities of Writing Training

I. The following formulas describe the converting process from a binary number to its decimal equivalent. Express it in your own words.

Step 1: 1010112 = (1*32) + (0*16) + (1*8) + (0*4) + (1*2) + (1*1)
Step 2: = 32 + 0 + 8 + 0 + 2 + 1 = 43.
Part VI. Exercises and Training Activities of Translation Training.

I. Translate the following paragraphs into Chinese.

Computer users require the ability to access and update data in multiple computer systems. This requirement stems from various needs including availability of data and increased performance for local site data access.

The required applications can be database management systems which provide a view of user data which is independent of its geographic location. They can also be application programs with a user defined protocol for exchanging messages.

Many systems have been developed in a non-distributed environment and have later been updated to include distributed data capabilities.

II. Translate the following paragraphs into English

对一个分布式系统而言,其主要目的是为用户提供一个具有更高的可用性,具有更大的处理能力,以及资源共享潜力增强的系统。由于此系统的复杂性,故障是不可避免的,尽管故障的发生不是很频繁。如果没有安装故障探测以及故障恢复等适当机制的话,此系统的性能可能不会令人满意。

我们要解决的是获得系统的全局一致状态的问题,这样如果发生故障(或故障发生的时候),就可以从一个全局一致状态重新启动过程。

The Key to the Exercises and Training Activities

Part I. Exercises and Training Activities of Language Study

I 1.operate 2.execute 3.have harnessed 4.hold 5.denote 6.bring down 7.prosper 8.wreak 9.compensate 10.allocate


V The first advantage of the distributed system over the centralized one is economics. A large number of cheap CPUs working together in a distributed system provide a tremendously better price/performance ratio than any centralized system would have.

Besides this, the high speed of the distributed system is incomparable to that of the mainframe in reality or in theory.

Another advantage is the higher reliability of the distributed system. By distributing the workload over many machines, a single chip failure will bring down at most one machine, leaving the rest intact.

The final advantage is that more processors can be added to the system, thus the computing power can be added in small increments.

VI As shown in this charter, the multiple CPU systems were classified by Flynn in terms of two essential characteristics: the number of the instruction stream and the number of the data stream, so the systems fall into the 4 categories: SISD, SIMD, MISD, and MIMD. SISD is the
system with a single instruction stream and single data stream. All traditional uniprocessor computers are of this field. SIMD, single instruction stream multiple data stream, into this category some supercomputers fall. The category is MISD, multiple instruction stream, single data stream, no known computer fit this model. Finally comes the MIMD, multiple instruction stream and multiple data stream and all distributed system belong to this category.

VII A Distributed System, according to the author, can be defined as a collection of independent computers that appear to the users of the system as a single computer. That is to say, the computers in a distributed system are autonomous, but to the users the system as a whole looks and acts like a classical single-processor system. We can get further knowledge of the concept by taking the example of network. In such a distributing system as a network, the machines and users are fundamentally independent of one another, but to some degree they are connected or interact to one another. They share some resources, such as databases or peripherals over the network.

Part II. Exercises and Training Activities of Reading Comprehension


II 1. It is in 1944 in the United States
2. It is because the number of computers at that time was very small and the way to connect them had not been found yet.
3. The first was the development of powerful microprocessor, and the second was the invention of high-speed computer networks.
4. LANs is the short form for the local area network, which allows dozens or hundreds of machines within a building or an area to be connected and the information can be transferred between them. WANs is the short form for the wide area networks which allows millions of machines all over the world to be connected. The Internet is a good example of WANs.
5. because the distributed system need radically different software than centralized system.
6. The first was the development of powerful microprocessors, many of which had the same computing power the previous larger mainframe, but for a fraction of the price. The second development was the invention of high-speed computer networks. The LANs(local area networks) and WANs(wide area networks) allow hundreds of thousands of machines to be interconnected and large amounts of data can be moved between machines at rates of 10 to 100 million bits/sec and sometimes more.

Part III. Exercises and Training Activities Listening Training

1. a collection of computer,  a single computer
2. has higher availability, greater productivity,  information sharing
3. the logical design,  the distribution of the databases,  recovery from failures

Tapescript:

Interviewer: I’m talking with Dr. George Smith, a professor and scientist form Berkley. He is going to give us some information about the distributed operating system. Dr. Smith , In the area of distributed systems, great advances have been achieved during the last decade. Efficient local area networks are now available to interconnect a variety of computer systems. Could you tell us what is the distributed system?

Dr. Smith: A distributed system is a collection of computers or processes that communicate with each other and appears to the users as a single computer.
Interviewer: What is the main aim when you design a distributed system?
Dr. Smith: In designing a distributed computing system, the main aim is to provide the users with a system that has higher availability, greater productivity, and increased potential for resource and information sharing.

Interviewer: Distributed database systems are becoming increasingly popular in the airline company, banking, and other information management systems. As a result, design methods for such systems are becoming more important. Would you tell me what is most important in the design of a distributed system?
Dr. Smith: There are many considerations to be made when designing such a system. The main issues in the design process are the logical design of the databases, the distribution of the databases, query processing, and recovery from failures.

Interviewer: Thank you very much for your helpful answers. I believe I’m beginning to get a mental picture of what a distributed operating system is like.

Part IV. Exercises and Training Activities of Speaking Training.
Today, I want to talk about the definition of the distributed system. It’s not easy to give a definition to distributed system, for there are many different definitions that have already been given. In my opinion, a distributed system is a collection of independent computers that appear to the users of the system as a single computer. What should be emphasized here is that the definition deals with two things, the hardware and the software. First, the computers are autonomous. And second, the system seems to be a single computer to the users.

Part V. Exercises and Training Activities of Writing Training.
The binary number is a number system with only the two digits 0 and 1 and with a set of weights that are derived from multiplication by 2. In order to convert from binary number system to decimal system, we have to determine the weight employed in the number system. For binary 101011, the weights associating with the characters 1,0,1,0,1,1 are respectively 32,16,8,4,2,1. Thus the process to convert a binary number to its decimal equivalent involves two steps: (1) Write out the expanded form of the binary number: 1010112 = (1*32)+(0*16)+(1*8)+(0*4)+(1*2)+(1*1). (2) perform the indicated arithmetic operations: =32 +0 + 8 + 0 + 2 + 1 = 43.

Part VI. Exercises and Training Activities of Translation Training.
I

II

In a distributed computing system, the main aim is to provide the users with a system that has higher availability, greater throughput, and increased potential for resource and information sharing. Due to the complex nature of such systems, failures, though infrequent, are inevitable. Unless the system is equipped with proper mechanisms to detect and recover from failures, the system may have unsatisfactory performance.

We address the problem of capturing a globally consistent state of the system, so that the processes can be restarted from a globally consistent state, if and when failures occur.
III. The teaching model of subject-based English

In China, the college English teachers are now unable to possess the systematic subject knowledge and most of subject teachers can not teach the students to develop their listening, speaking and writing skills. So by using computer, multi-media and network techniques, optimized courseware system of subject-based English can be compiled, which is appropriate for personal computer, local network, campus network and interne. In the courseware system of each unit, the new words and expressions, text, listening and speaking exercises, and other audio materials are recorded by English native teachers; the contents of writing course are prepared by ESP/EAP experts and made the special software; the reading and translation parts are finished by the subject teachers.

The courseware system assembles textbooks, tapes, disks and software, forming courseware platform including six modulus of watching, listening, speaking, reading, writing and translation functions. By making full use of multi-media techniques and its best management, Effectively the learners are trained and their integrated language skills are developed.

The new teaching model is not only the change of teaching activity and means, but also the transfer of teaching concept. The new idea is that we should make subject-based English teaching turn to the direction of learner-central, individual, initiative, autonomic and participative language learning. In this new teaching model, the teacher should have a new idea about teaching subject-based English that the teacher is not the sole authority who dominates the class activities and the only source of language learning knowledge but is the instructor, trainer, facilitator and good friends of the learners. From that view, the teacher’s main function is to play an example role for the students and guide, propel and encourage them to take an active part in learning, applying and acquiring subject-based English.

IV. The teaching method of subject-based English

The teaching activity ought to be learner-central, in which the learners should be esteemed, encouraged and given the most chances to do language practice and communication in order to impel them to take an active part in the activities, learn language knowledge and develop integrated language applying ability on their own initiative. The students should be given more chances to do the exercises in English communicative activities with a partner or in a group in following ways

Figure 1. The Language Communicative Model Between Teacher and Students (T=Teacher, S=student)

Figure 2. The Language Communicative Model Between Students in pair work (T=Teacher, S=student)
Teachers must guide learners to do good jobs of preparing lessons before class, doing practical communicative activities in class, and revising lessons and extending knowledge and developing more language skills and applying ability after class.

Through the weaving language practical activities, quickly and effectively, learners can accumulate language knowledge of pronunciation, vocabulary, sentence structure, function and notion, paragraph, context, text organization and thinking way in subject-based English and develop listening, speaking, reading, writing and translation skills, communicative ability and self-study ability of English.

References