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A STUDY ON THE PROBLEM OF ENGLISH INSTRUCTION OF JUNIOR COLLEGES OF TECHNOLOGY WITH SPECIAL REFERENCE TO AND ITS CONNECTION WITH JUNIOR MIDDLE SCHOOL ENGLISH TEACHING

Tu Hsueh-Er (涂雪娥)

ABSTRACT

For further industrialization of our country, many junior colleges of technology have been established, and the curriculums and the teaching have been continually studied and improved. The English course is about 10% of the total requirements in all the junior colleges of technology. However, from the Reserve Officer Examination for the graduates of these junior colleges, the writer has found that there is a failure symptom on their learning of English. But without adequate evaluation method, I cannot understand clearly where the problem is. Therefore, in this study, questionnaires were used to compare students' and teachers' points of view on the problem of studying English and to understand possible sources and kinds of difficulties. Then, statistics and quantitative analysis were used to evaluate the teaching materials of English, and found out the disconnected point in the learning process, which, I believe, is the source of learning obstacle and needs to be improved.

The result of study shows that most of the teaching materials of English being used in the junior colleges of technology have few or no problem. However, there is an obvious and abrupt step in the English teaching of junior middle school. Therefore, most of the students in the 5-year junior college of technology feel that they have rather poor English background. Furthermore, both teachers and
students feel that teaching methods must be changed or improved. However, under the present educational system, this is not so easy to be fulfilled.

Strange to say, all the junior college students of the fourth year have strong learning interest in English conversation and Engineering English, and expect to have these elective courses in the fourth or the fifth year. Through this study, it is hoped to have a deeper understanding of English teaching of the 5-year junior college of technology and to provide as a reference for further investigations.
1. INTRODUCTION

Description of problems

Industrial development and economic growth are two of necessary ways to transform a developing country to a well-developed one. Therefore, they must be started and fulfilled in the short time in our country.

However, the development of industry is based on the development of industrial education. At present, the system and the institute of industrial education are quite complicated in our country, but the numbers of students, in the 5-year system of junior college of technology is the first and that of 2-year system is the second. The aim of junior college of technology is illustrated clearly by the first law of the junior college education which is derived according to Article No. 158 of the Constitution of the Republic of China. The junior college education aims at the cultivation of specialized personnel under the instruction of applied sciences and practical techniques. For decades the government plans to cultivate specialized industry personnel, so, there were many junior colleges established, such as Kaohsiung Institute of Technology, Taipei Institute of Technology, Ming-chih, Ming-hsin, Yun-ling, Hsin-pu, Yun-tung, Nan-tai, Kun-shan, etc., thirty-three junior colleges of technology in total, which are about half of the total number of junior colleges in Taiwan. It indicates the importance of the development of industrial education of junior college.

Although the quantity of industrial education of junior college grew rapidly, it was not insure the promotion of its quality. Therefore, the substance of this educational system needs to be understood more thoroughly. Furthermore, to design an adequate curriculum and to fulfill the goal of education are the responsibilities both of teachers and of educators. So, on the one hand, the Ministry of Education has put much effort on the standardization of curriculum and textbooks. In 1975 and 1982, the scholars of different fields in Taiwan were invited to revise twice the curriculum. On the other hand, many specialists have investigated and analyzed the problem of this new system of education. For example, the analysis of the correlation of 5-year system industry college student's academic accomplishment to interest of occupation; the discovering of adaption problems on curriculum; the study on stu-
dent's aptitude, attitude, motivation on mathematics and the efficiency of learning on mathematics. However, there is no single literature or report on the accomplishment of one of the required courses, the first foreign language "English". At the present time, English is a three year course with a total of twenty-two credits in the curriculum of 5-year program junior college. I don't know whether the present teaching method is effective or not, the content is suitable or not? And these problems I needed to understand deeply.

In this system, the students of the first three years are of the same age as those of senior middle school; and in the later two years, they are equal to those at junior college. Since the aim of teaching is different, and the attitude and the environment of learning are quite different from those of senior middle school, the teachers should consider whether or not the English teaching materials and methods can be used at university and in senior middle school.

At present, there is no unified examination or evaluation methods to judge the result of English teaching in junior college of technology, and I don't know whether there are any problems existing. (Joint entrance examination for colleges and universities is one of the ways to evaluate the English teaching in senior middle school.) However, from my frequent observations and contacts with students, especially from the joint examination which some of the male students have to take for reserve officers before graduation, I have known that the students have encountered some obstacles in English-learning. For example, at the National Kaohsiung Institute of Technology, one of the best junior colleges of technology in Taiwan, the average score in English of such an examination has been relatively low in the past few years. Those students were highly selected by the annual joint entrance examination, in which they had to pass these examinations in Chinese, English, Mathematics, Chemistry, and Physics, and they were the top 1% of the scores in the total 60,000 competitors. However, the English scores in the Reserve Officer Examination of such students of good quality, after a few years, are shown as Table 1. (Table 2 also illustrates the English scores of 2-year program students of the same college.)

Therefore, the purpose of this study is trying to discover:
(1) Was there any difficulty when students were learning English?
(2) If there was any, what was the source of the problems?
(3) Are there any techniques and methods which can be applied to solve these problems?
As the scope of the topic is too wide, it will be illustrated in several sections.

| Table 1 |
The 5-year Program Students' Average English Scores in the Reserve Officer Examination at the National Kaohsiung Institute of Technology from 1978 to 1982

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| Table 2 |
The 2-year program Students' Average English Scores in the Reserve Officer Examination at the National Kaohsiung Institute of Technology from 1978 to 1982

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</table>

* The full score is 30 and the average score is the total score of all students divided by the number of students in that department.
** Courtesy of the office of the dean of students, N.K.I.T.
2. THE SCOPE AND THE METHOD OF STUDY

From the previous statements, one would be aware that there may be some problems in English study at the junior college of technology. Thus, as the main point of research, I will try to find out the situation and the source of problems.

The objectives of study, the area of study, the key point of study, and the procedure of study are illustrated separately as follows:

2.1 The objectives of study—The study on the students of 5-year program of junior colleges of technology

There are many systems and programs in the junior colleges of technology in our country, such as 5-year program, 3-year program, 2-year program, night school, and affiliated school, and these programs or systems may be present in the same institute. Since the 3-year program is present only in the Taipei Institute of Technology, I excluded the students of 3-year program. I also excluded the students of night school and affiliated school, because it is difficult to analyze the test result, due to the fact that they are part-time students and their quality, vocations and background are various. Although there are a great number of students registered in the 2-year program at junior colleges of technology, I did not regard them as subjects of research at this time for several reasons.

(1) They came from different senior vocational schools in Taiwan. They were examined by individual’s specific profession for entering the program. For example, a student to major in mechanical engineering of 2-year program had to be a graduate of senior vocational school in the majors of mechanics, bench work, cold forging or mechanical drafting, and an electric engineering major had to be a graduate of vocational school majoring in one of the following departments: electronic, electricity, communication, family electricity appliance, refrigeration and air condition, etc.

(2) Although these students were of different majors ( in vocational school ), they had the same general required courses, such as Chinese, English, and Mathematics, and the same credits for each course, which legitimated by the Ministry of Education. However, every school might use different teaching materials. Furthermore, the quality and the learning attitude of students were also dif-
ferent, so the main goals of teaching were different as to their majors and schools. Therefore, the level of English of these students had been quite different before they entered the 2-year program junior colleges.

(3) Since these students had only six credit hours of English at the 2-year program junior colleges, apparently, their English grade was more influenced at senior vocational school than at a junior college.

In view of the said reasons as too many factors affected the analysis of the problems, I did not think of them as objectives of my study. Finally, I decided to study the problems of English learning of the students of 5-year program. As they were the largest numbers at junior colleges, and they used uniform English textbooks in junior middle school, their English backgrounds were similar before they entered junior college of technology. Therefore I could eliminate most variables in analyzing problems, and get more reliable results.

I selected 25 different junior colleges of technology which had 5-year program students. Questionnaires were sent to the fourth year students, but I only randomly sampled 5 to 6 students in different majors. Five hundred copied of questionnaires were sent out and two hundred and twenty-one were answered. I selected the fourth year students as subjects for two reasons: on the one hand, these students had just finished all English requirements, and they had better memory; on the other hand, they were about the age of university students and their mental development were more mature. They had more independent and mature viewpoint on the goal of English-learning. To better understand the actual situation, I also sent questionnaires (designed in a different way) to the English teachers of each junior college. Six copies of questionnaires were delivered to each junior college, totaling 150 but 37 in return. These questionnaires were compared with students' questionnaires for better investigation and study.

2.2 Methods of study

Since the scope of study was too wide, at the beginning of the research, I had to work out the methods and the directions of total scheme, and set up the key point of this study. The following flow chart is an algorithm of analysis procedures on the problems under consideration.
Start
Send questionnaires to teachers and students

Is there any difficulty in English-learning?
Yes
Find the source of problems

Is it due to the poor English background in junior middle school?
No
Is it due to the lack of interest in learning?
No
Is it due to the difficulty in adapting present teaching methods?
No
Due to other reasons.

No
Investigate the students' expectation on teaching methods.

Yes
Suggest to improve the communication between teachers and students.

Yes
Is it because of different viewpoints in teaching goal between teachers and students?
No
Due to other reasons.

Yes
Revise the content of the textbooks.

No
Suggest to use some other effective teaching methods.

Yes
Analyze the English textbooks of 5-year program junior colleges and junior middle schools to find out the problem of continuity.
According to the algorithm, the steps of study were followed, and questionnaires were designed and mailed to English teachers and students of public and private junior colleges of technology in Taiwan. By using statistic analysis, I tried to find out the direction of problems and to solve the problems. From the algorithm, it indicates that the main work of this study is not only to design the questionnaires to understand and judge the situation of problems, but also to analyze the English textbooks to find out the connection problems which may occur between junior middle school and 5-year program junior college. There is a connection between degree of difficulty of teaching content and the development of intelligence of students. Sometimes, the relationship may be unparallel. If such relationship occurs, the student's load of studying will change apparently. In other words, during the learning process, students will feel the content of textbook is too easy or too hard, and finally lose the interest in learning. In the algorithm, I put the work of analysis of textbooks right after students answer in the questionnaires that their problems are "Due to poor English background in junior middle school". If the result shows that there is no connection gap between junior middle school and 5-year program junior college, I then analyze English textbooks of the second year and the third year of junior middle school, in order to find out the disconnection in the continuous learning materials. This disconnection is possibly the source that makes the majority of students feel it is difficult to learn English through junior middle school and feel that they have "poor English background".

As the student's English level was unknown, after careful consideration, I decided to design the questionnaire in Chinese. In this way the students would answer the questions more easily and understand the questions. However, there were some semantic problems, for instance, the meaning of "interest" in Chinese is "fondness" and "to value highly", but also has the meaning of "expectation". In other words, when a student answered "interest in English", it might mean that he expected to get some accomplishment in studying English, but it did not indicate he had no difficulty in learning. For example, in a question which was asked to analyze the source of difficulty in learning, I regarded "lacking interest" as one of the answers. Here, lacking interest means "dislike" owing to environmental influence. Therefore, some students might answer that they did have interest in English, but to the "have difficulty in learning"
question, they chose "lacking interest." That does not conflict, just on account of the difference in Chinese from that in English. I designed the questionnaire in Chinese, and avoided long phrases, definitions, and explanations. In this way, I expected higher rate of recovery.

There were two main key points in regard to the analysis of the English teaching materials. One was the content of the textbook; the other was the degree of difficulty of teaching materials. The contents of the English readers were classified according to the goal of teaching. However, this goal may have difference between teachers and students, but no matter what kind of difference may exist, teachers have to use some teaching materials as media to pass the knowledge on to students. Therefore, the tools (textbooks) and methods used by English teachers were my target to analyze. If the contents of the teaching materials failed to match students' professional interest, the motivation of students' learning would be lowered by the wrong tools used. This has been proved by Professor Wang⁴ and many other scholars in their reports on the relationship between academic achievement and professional interest⁶. Since the subjects of my study were students of junior colleges of technology, the analyses of teaching content were thus classified, according to the purpose of learning, into the following items: (1) western culture, (2) daily life conversation, (3) tools and terminology related to future profession. Besides the questionnaire survey on teachers and students, I also analyzed the content of all English textbooks currently used by each junior college of technology under consideration.

Concerning the analysis on the degree of difficulty of teaching materials, generally speaking, literature, unlike science and technology, is very hard to do quantitative analysis. However, without quantitative statistic value, it is very difficult to obtain an unbiased result. Therefore, in this study, I tried to use some countable data to analyze and evaluate the degree of difficulty of teaching content. Other undefined problems on difficulty were hard to judge, so they were not considered so far. There were three countable data on teaching materials of junior middle school and junior college of technology. The first value was the average of "T-unit" (minimal terminable unit)⁹. The definition of T-unit is the total unit numbers of clauses in a chapter divided by the total numbers of sentences in the same chapter. The way to account the unit is that one clause, whether coordinate clause or subordinate
clause, is one unit, but all the phrases and words modifying a clause are included. Of course, a simple sentence is one unit and its T-unit value is 1. Therefore the T-unit value of any sentence should not be less than 1. For instance, if an article has 2.4 average T-unit value, it indicates that there are many complex clauses structure in it. Almost all the sentences in the article are compound, complex, or compound-complex ones, and simple sentences are very few. Apparently, this kind of article is harder than that of T-unit equal to one. The second value was average words in one clause. This calculation can show the length of each clause and also reflect the degree of comprehension. The last, the third value was the average number of vocabulary words of each lesson. The numbers of vocabulary words would be good for evaluating the memory burden of student's learning. Thus, the first and second data were to evaluate the student's understanding capacity. The third data, for the evaluation of the student's memory ability, was to be used only as a reference in this study. Since the students are at the age of increasing their memory ability. The influence of vocabulary words over English-learning only occurred when there was an overloading case. Unfortunately, since the rate of occurrence of vocabulary words relating to the student's profession was hard to trace, analysis on the function of vocabulary words relating to the student's professional interest was out of my knowledge; I was unable to discuss it deeply.
3. RESEARCH DESIGN AND IMPLEMENT

3.1 Student’s questionnaire design Appendix 1

According to the algorithm described in the previous section, I
designed the problems as follows:

Relating to general idea:
(1) How do you feel about English study? (a) interested or (b)
uninterested.
(2) Do you have difficulty in learning English? (a) Yes or (b) no.
(3) If you have difficulty which is due to (a) poor background in
junior middle school (b) having no interest or (c) an unadaptable teaching method?

Relating to the English textbooks:
(4) The English textbooks of your school are (a) very difficult (b)
easy or (c) fair.
(5) Besides English textbooks, is there any outside reading? (a)
yes or (b) no.

Name of publisher of textbook:
Name of conversation book:
Name of grammar book:

(6) In an English textbook, the article that you like to read is
(a) lyrical writing (b) fiction (d) essay, poetry (d) narration (e) theory (f)
applied article (g) conversation or (h) legend.

(7) How do you feel about the current English course credits? (a)
fair (b) not enough or (c) too many.

(8) Which of the following subjects do you feel you have to con-
tinue studying in the fourth and the fifth year? (a) engineering
English, English conversation (b) English conversation (c) engineering
English or (d) no further study.

Relating to the communication of educational goal:

(9) What is the most important skill in learning English? (a)
listening comprehension (b) reading ability (c) speaking ability or (d)
writing ability.

(10) The purpose of learning English is: (a) understanding western
culture (b) learning daily conversation or (c) having tools for future
job.

How to improve the teaching environment:
11) Are you interested in using language center (or audio-visual center)? (a) Yes or (b) no.

12) Does your school have language center (or audio-visual center)? (a) Yes or (b) no.

13) If the lessons of news and science fiction are added in a textbook, do you think it will increase your learning interest? (a) Yes or (b) no.

14) Using an English textbook of specialized technical courses in those senior years, do you think it will help to build up you English ability? (a) helpful (b) no help or (c) obstacle in learning.

I mailed out the questionnaires at the beginning of June, 1982. The objectives I chose were the fourth year students of twenty-five 5-year junior colleges of technology. Then in every department of each junior college, five or six class representatives were selected randomly to answer the question. About two weeks after questionnaires were sent out, 44.2% of questionnaires were returned. The numbers of returning questionnaires and that of English textbooks used in each junior college are shown in the following table: (Table 3-1)

3.2 The questionnaire designed for teacher Appendix 2

I used different ways to describe the question in the questionnaire for teachers to avoid the bias influence. For example, I could not use the same description as is for students in the problem of learning difficulty because of "unadaptable teaching method," for this would embarrass the teacher. Therefore, in the same problem, I used "not enough credits" and "inadequate teaching materials" for answer. Those two conditions were not controlled by teachers: the former was limited by the educational program; the latter was decided by the authorities of each junior college. I also had the same questions both in student's and in teacher's questionnaire. From these questions, I liked to see different views from students and teachers on the same problem, in order to understand the actual situation of the problem and find some possible ways to solve it. The whole questionnaire was as follows:

1) The difficulty in English teaching is due to (a) students have poor background in junior middle school (b) the credits are insufficient (c) teaching materials are inadequate or (d) students have no interest.

2) The textbooks you think, for a student of junior college of technology, is (a) too difficult (b) fair or (c) too simple.

3) Do you feel the credits of English are (a) fair (b) not enough or
Table 3-1

<table>
<thead>
<tr>
<th>Name of junior college</th>
<th>Name of publisher English textbook</th>
<th>Number of questionnaires mailed out</th>
<th>Number of questionnaires returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ta-han</td>
<td></td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>2. Taipei</td>
<td></td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>3. Ming-chih</td>
<td>Tung-hua&lt;sup&gt;10&lt;/sup&gt;</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>4. Wu-feng</td>
<td></td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>5. Kun-shan</td>
<td>Fu-hsin&lt;sup&gt;11&lt;/sup&gt;</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>6. Chen-hsiu</td>
<td>Hai-kuo&lt;sup&gt;12&lt;/sup&gt;</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>7. Tung-fang</td>
<td></td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>8. Hua-hsia</td>
<td>Ta-hai&lt;sup&gt;13&lt;/sup&gt;</td>
<td>25</td>
<td>14</td>
</tr>
<tr>
<td>9. Fu-hsin</td>
<td>Huang-chiu&lt;sup&gt;14&lt;/sup&gt;</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>10. Chien-hsin</td>
<td>Huang-chiu</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>11. Ming-hsin</td>
<td>Ta-hai</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>12. Shu-te</td>
<td>Fu-hsin</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>13. Hsin-pu</td>
<td>Huang-chiu</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>14. Nan-jeng</td>
<td>Fu-hsin</td>
<td>25</td>
<td>18</td>
</tr>
<tr>
<td>15. Ying-ta</td>
<td>Tung-hua</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>16. Ta-hua</td>
<td>San-ming&lt;sup&gt;15&lt;/sup&gt;</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>17. Yun-tung</td>
<td>Yung-tung</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>18. Li-ming</td>
<td>Tung-hua</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>19. Chung-hua</td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>20. Nan-tai</td>
<td></td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>21. Tung-nan</td>
<td>Ta-hai</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>22. Kung-wu</td>
<td>Tung-hua</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>23. Nan-kai</td>
<td>Hai-kuo</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>24. Shih-hai</td>
<td>Tung-hua</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>25. Chien-kuo</td>
<td>Sang-ming</td>
<td>25</td>
<td>10</td>
</tr>
</tbody>
</table>

(c) too many?

(4) Do you agree there are selective courses in engineering English for students in the fourth and the fifth year? (a) Yes (b) no or (c) it does not matter.

(5) What do you think is the most important materials to be taught? (a) western culture (b) daily life conversation or (c) tools for students’ future profession.

(6) Do you think a language center is good for English teaching? (a) helpful (b) not helpful or (c) depending on students.

(7) Does your junior college have a language center (or audiovisual center)? (a) yes (b) no or (c) under consideration.

(8) Do you have any opinions on motivating students to learn English? (a) yes or (b) no. (If any, please write down your valuable opinions.)
<table>
<thead>
<tr>
<th>Name of junior college</th>
<th>Number of questionnaires mailed out</th>
<th>Number of questionnaires returned</th>
<th>Opinions on the eighth question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ming-chih</td>
<td>6</td>
<td>4</td>
<td>By singing, game, or contest. By using recorder media. By participating in teaching activity.</td>
</tr>
<tr>
<td>Tung-feng</td>
<td>6</td>
<td>4</td>
<td>By adequate teaching materials. By active and vivid teaching methods.</td>
</tr>
<tr>
<td>Wu-feng</td>
<td>6</td>
<td>2</td>
<td>By speech, opera, and writing contest. By organizing English association.</td>
</tr>
<tr>
<td>Shu-te</td>
<td>6</td>
<td>4</td>
<td>By participating in teaching activity. By classifying students into small groups, according to their English knowledge.</td>
</tr>
<tr>
<td>Chung-hua</td>
<td>6</td>
<td>6</td>
<td>By setting up audio-visual center to promote students’ speaking and listening abilities. By using teaching instruments and tools to enrich the effect of teaching.</td>
</tr>
<tr>
<td>Yun-tung</td>
<td>6</td>
<td>4</td>
<td>By limiting students’ number, not to exceed 40 in one class. By increasing the class hours to give students more chance for response and practice.</td>
</tr>
<tr>
<td>Ying-ta</td>
<td>6</td>
<td>4</td>
<td>By small teaching group system. By increasing teaching hours. By having more practice in conversation.</td>
</tr>
<tr>
<td>Tung-nan</td>
<td>6</td>
<td>5</td>
<td>By using practical materials. By having more practice in conversation.</td>
</tr>
<tr>
<td>Chien-kuo</td>
<td>6</td>
<td>4</td>
<td>By starting from basic grammar. By memorizing more words. By making sentences to reinforce the in memory.</td>
</tr>
</tbody>
</table>
3.3 The implement of the teacher's questionnaire

In the middle of June, 1982, the questionnaires were sent to 25 junior colleges which were of the same schools chosen for students' survey. I sent out six copies to each school, totally 150 but only 37 returned from nine junior colleges.

In table 3-2, I listed all opinions from Question 8, for the reference on improving teaching.

3.4 The statistics analysis

In the questionnaires, the significant difference of the same question was analyzed by $x^2$ test. The formula is:

$$x^2 = \sum \frac{(f_o - f_e)^2}{f_e}$$

$f_o$: observed number
$f_e$: expected number

Next, by means of "two factors classification method", I analyzed the difference between teachers and students, or the individual difference to reflect the same question in teachers' or students'. I did an independent test, by the following formula:

$$x^2 = N \left( \frac{1}{\sum_{i=1}^{I} f_i} \cdot \frac{1}{\sum_{j=1}^{J} f_j} \right) \\ df = (R - 1)(C - 1)$$

Here $R$ is the row number, $C$ is the column number, and $df$ is the degree of freedom.

For analyzing the degree of difficulty of material content, because the number of chapters, and the data of each chapter are various from one book to another, the significant difference between two books in certain evaluation was using the significant different test in average number. As the variable numbers of two groups were unknown and the sample was small, the fitted statistics formula is:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{s_p^2 \left( \frac{1}{N_1} + \frac{1}{N_2} \right)}}$$

Here

$$s_p^2 = \frac{\sum (x_1 - \bar{x}_1^2) + \sum (x_2 - \bar{x}_2)^2}{N_1 + N_2 - 2}$$

$$df = N_1 + N_2 - 2$$
Since some students did not answer all the questions, some of the total number used in the statistics were different from those of returned questionnaires.
4. RESULT AND DISCUSSION

4.1 Analysis of questionnaire

In this section, I followed the analyzing procedure described in the section (p. 7) of methods of study to understand the meaning of responses step by step and to find out the center of problems.

**Question 1** How does the student feel in learning English? (a) interested or (b) uninterested. (the first question of student’s questionnaire)

<table>
<thead>
<tr>
<th></th>
<th>(a)</th>
<th>(b)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>$f_o$</td>
<td>165</td>
<td>56</td>
<td>221</td>
</tr>
<tr>
<td>$f_e$</td>
<td>110.5</td>
<td>110.5</td>
<td>221</td>
</tr>
</tbody>
</table>

$$x^2_{0.999(1)} = 10.827 \quad df = 1$$

$$x^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 53.76$$

$$53.76 > 10.827$$

According to foresaid data, students are interested in learning English. The significant difference is up to 0.001.

**Question 2** Does the student feel difficult in learning English? (a) yes or (b) no. (the second question of student’s questionnaire)

<table>
<thead>
<tr>
<th></th>
<th>(a)</th>
<th>(b)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$f_o$</td>
<td>149</td>
<td>72</td>
<td>221</td>
</tr>
<tr>
<td>$f_e$</td>
<td>110.5</td>
<td>110.5</td>
<td>221</td>
</tr>
</tbody>
</table>

$$x^2_{0.999(1)} = 10.827$$

$$x^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 26.83$$

$$26.83 > 10.827$$

In this question, the difference between two answers reaches 0.001 significant level indicates clearly that students have difficulty in learning English. In other words, it is necessary and valuable to do the follow-up study to discover the origin of problem.

**Question 3** The reason why the student feels difficult in learning English is (a) poor background in junior middle school (b) having no interest or (c) an unadaptable teaching method. (the third question of student’s questionnaire)

<table>
<thead>
<tr>
<th></th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$f_o$</td>
<td>98</td>
<td>14</td>
<td>73</td>
<td>185</td>
</tr>
<tr>
<td>$f_e$</td>
<td>61.7</td>
<td>61.7</td>
<td>61.7</td>
<td>185</td>
</tr>
</tbody>
</table>

$$x^2_{0.999(2)} = 13.815$$

$$x^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 60.3$$

$$60.3 > 13.815$$

In this question, the difference is 0.001 significant level. It indicates that 53% of the students have poor background in junior middle
schools, 39% feel unable to accept present teaching methods, and a small percentage of them feel no interest in learning English. This is true. From teachers' point of view, they feel difficulty in teaching English because (a) students have poor background in junior middle schools (b) the credits are not enough (c) teaching materials are inadequate or (d) students have no interest. (the second question of teacher's questionnaire)

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>f₀</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>12</td>
</tr>
</tbody>
</table>

\[
x^2 = \sum \frac{(f_0 - f_1)^2}{f_0} = 2.89
\]

\[
x^{2.95(3)} = 7.815
\]

The significant difference is larger than 0.05, so the assumption is acceptable. This may be due to the fact that teachers are unfamiliar with students' English level before they enter junior colleges of technology. Besides, as the answer "having no interest" is the reason of difficulty in learning English, there is an opposite point of view between teachers and students. Apparently, teachers classify into "having no interest" group those students who have difficulty in learning English and avoid studying. From the response of this question, it is necessary to investigate the problem of "why students feel that they have poor background in junior middle schools?" After analyzing this problem carefully, I may conclude two possible factors. First, the content of the textbook of junior college of technology is too difficult while it is too easy in junior middle school, which results in a disconnection problem: therefore, students feel that they have poor background. Secondly, there is a problem in English teaching in junior middle school. Students did not study well during this period. Even if the content of the textbooks at junior college of technology is not harder than that in junior middle school, students still feel that they have poor background in junior middle school. To judge the real reason of difficulty in learning English, I will begin to get answers from the following questions and then analyze the degree of difficulty of English textbooks content of junior colleges of technology.

**Question 4** How does the student feel about the English textbook used in a junior college of technology? (a) very difficult (b) easy or (c) fair. (the fourth question of student's questionnaire)
From this result (the significant difference is 0.001), it indicates that about 80% students feel that the English textbook is fair or easy, although majority of them feel difficult in learning English. (from the result of Question 2 in this section)

The same question was also asked in the teacher's questionnaire: (a) very difficult (b) easy or (c) fair. (the fourth question of teacher's questionnaire)

\[
\begin{array}{ccc|c}
(a) & (b) & (c) & \text{220} \\
\hline
f_0 & 45 & 81 & 94 \\
f_0 & 73.3 & 73.3 & 73.3 \\
\end{array}
\]

\[
x^2 = \sum \left( \frac{f_0 - f_e}{f_e} \right)^2 = 17.59 \\
17.59 > 13.815
\]

The result indicates teachers have different response with students. However, to the same question, the difference is 0.001 (standard deviation). In other words, both teachers and students feel the textbook is not difficult in the degree of difficulty. Therefore, the target for searching the problem should switch to the second factor, "there is something wrong in English teaching in junior middle school." From the previous analysis and discussion, it leads me to study the connection problem of English teaching between junior middle school and junior college of technology. Before going on to this problem, I have to analyze the questionnaires on English teaching.

**Question 5** In your school, besides the English textbook, is there any outside reading? (a) yes or (b) no.

Names of publishers and books:

(The fifth question of student’s questionnaire)

The purpose of this question is trying to understand whether the supplementary materials are necessary or not in a junior college of technology in the English course, besides the regular textbook which
containing grammar and conversation. I used school numbers as analyzing factor:

\[
\begin{array}{ccc}
\text{(a)} & \text{(b)} & \text{df} = 1, x^2_{.05(1)} = 3.841 \\
\begin{array}{ccc}
14 & 10 & 24 \\
12 & 12 & 24
\end{array}
\end{array}
\]

\[
x^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 0.676
\]

\[
0.676 < 3.841
\]

The need of supplementary books has no significant difference in each junior college. Most of the questionnaires did not give the names of supplementary books.

**Question 6** In English textbooks, the article that a student likes to read is (a) lyrical writing (b) fiction (c) essay, poetry (d) narration (e) theory (f) applied article (g) conversation or (h) legend. (the twelfth question of student's questionaire)

The purpose of this question is to make teachers understand the style and interesting articles which students like best. The result is analyzed as follows: (multiple selection)

\[
\begin{array}{cccccccc}
\text{(a)} & \text{(b)} & \text{(c)} & \text{(d)} & \text{(e)} & \text{(f)} & \text{(g)} & \text{(h)} \\
\begin{array}{cccccccc}
35 & 62 & 25 & 37 & 12 & 37 & 99 & 51 & 358 \\
44.75 & 44.75 & 44.75 & 44.75 & 44.75 & 44.75 & 44.75 & 44.75 & 358
\end{array}
\end{array}
\]

\[
df = 7, x^2_{.01(7)} = 24.322, x^2 = 110.78 > 24.322
\]

The significant difference is up to 0.001, indicating that students have some tendency and favor in certain style of articles. Suprisingly, students like conversation and fiction most. The meaning of this phenomenon is unknown but worthy of further investigation in future.

**Question 7** How do you feel about the current English course credits? (a) fair (b) not enough or (c) too many. (the tenth question of teacher's questionnaire but the ninth question of student's questionnaire)

For this question, I compared the viewpoint of teachers and with that of students.

\[
\begin{array}{ccc}
\text{(a)} & \text{(b)} & \text{(c)} \\
\text{S} & 84 & 98 & 34 & 216 \\
\text{T} & 9 & 28 & 0 & 37 \\
\hline
93 & 126 & 34 & 253
\end{array}
\]

\[
df = 2, x^2_{.05(2)} = 9.21
\]

\[
x^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 13.55
\]

\[
13.55 > 9.21
\]
From the calculation result, I have found that the need of credit hours is different between teachers and students, and the difference is significant. Seventy-five percent of teachers feel "not enough," and only forty-five percent of students have the same feeling. Therefore, more students feel the credit hours is fair than teachers. The reason for this difference may be that teachers have more knowledge and expect that more materials should be taught, but students may have no idea in the scope of English and require less materials. In fact, there is no quantitative evaluation to a language teaching. The best way is to help students fully understand grammatical structure and closely observe the attitude and learning will of students in order to have best effort in learning. Based on this, the student's English level, interest, and goal should be understood and then, the content of teaching materials should be watched. Therefore, adding or subtracting credit hours is not the main point of problem.

Question 8 Which of the following subjects do you feel have to continue studying in the fourth and the fifth year? (a) engineering English and conversation (b) English conversation (c) engineering English or (d) no further study. (the tenth question of student's questionnaire)

<table>
<thead>
<tr>
<th></th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
<th>(d)</th>
<th>(e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f_0$</td>
<td>109</td>
<td>73</td>
<td>10</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>$f_\varepsilon$</td>
<td>44.2</td>
<td>44.2</td>
<td>44.2</td>
<td>44.2</td>
<td>44.2</td>
</tr>
</tbody>
</table>

$\chi^2 = \sum \frac{(f_0 - f_\varepsilon)^2}{f_\varepsilon} = 181.51$

The result shows most of the students feel that it is necessary to study engineering English and conversation simultaneously in the fourth and the fifth year.

Question 9 The question related to how many chapters are taught in every semester? Since the deviation was too large in the same class, I decided to give it up. (the fifteenth question of student's questionnaire)

<table>
<thead>
<tr>
<th></th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
<th>(d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f_0$</td>
<td>39</td>
<td>61</td>
<td>113</td>
<td>5</td>
</tr>
<tr>
<td>$f_\varepsilon$</td>
<td>54.5</td>
<td>54.5</td>
<td>54.5</td>
<td>54.5</td>
</tr>
</tbody>
</table>

$\chi^2 = \sum \frac{(f_0 - f_\varepsilon)^2}{f_\varepsilon} = 112.94$

The result shows most of the students feel that it is necessary to study engineering English and conversation simultaneously in the fourth and the fifth year.
The result shows that students expect to have better speaking ability. The reason is worth contemplating, because the personalities of young students are energetic and outgoing.

**Question 11** The purpose of learning English is: (a) understanding the western culture (b) learning daily life conversation or (c) having tools for a future job. (the third question of teacher's questionnaire but the eleventh question of student's questionnaire.)

From this question, I may analyze the difference in studying goal between teachers and students.

\[
df = 2, \ x^2 \cdot _{0.05(2)} = 5.991
\]

<table>
<thead>
<tr>
<th></th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>f_o</strong></td>
<td><strong>S</strong></td>
<td><strong>T</strong></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>91</td>
<td>114</td>
<td>217</td>
</tr>
<tr>
<td>1</td>
<td>16</td>
<td>16</td>
<td>33</td>
</tr>
<tr>
<td>13</td>
<td>107</td>
<td>130</td>
<td>250</td>
</tr>
</tbody>
</table>

\[
x^2 = \sum \frac{(f_o - f_s)^2}{f_s} = 0.72
\]

\[
0.72 < 5.991
\]

<table>
<thead>
<tr>
<th></th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>f_s</strong></td>
<td><strong>S</strong></td>
<td><strong>T</strong></td>
<td></td>
</tr>
<tr>
<td>11.28</td>
<td>92.87</td>
<td>112.84</td>
<td></td>
</tr>
<tr>
<td>1.72</td>
<td>14.12</td>
<td>17.16</td>
<td></td>
</tr>
</tbody>
</table>

The result to recognize the importance of both (b) and (c) shows that the purpose of the student's and the teacher's study is unanimously the same. The textbook is a communication tool between teachers and students. If the content of it is not acceptable for teachers and students, then inconvenience may occur in teaching. In the previous analysis and discussion, a few percentage of students have difficulty in learning English because of lacking interest, and in Question 10, they also have the same learning expectation such as of conversation, but they do not have a learning obstacle because of the difference between what they want to learn and what they are studying now! (This is out of prediction when the questionnaire was designed.) In order to help teachers to understand the classification of each lesson in different published textbooks, I have tried to analyze and classify them as follows, although the classification is not perfect:
From the above-mentioned table, only the textbook published by Fu-hsin fits the teaching and the studying goal of teachers and students. Unless I do the academic accomplishment analysis, it is hard to say that the textbook fitting both students' and teachers' goal will influence the effect of learning.

The following questions are related to the environment of studying and the possible ways of increasing the students' interest in study.

Question 12. Are you interested in using a language center (or audio-visual center) to study English? (a) yes or (b) no. (the seventh question of student’s questionnaire)

\[
\begin{array}{c|c|c|c|c|c}
(a) & (b) & \text{Total} & x^2 & x^2_{.999(2)} & x^2_{.99(2)} \\
\hline
12 & 91 & 114 & 60 (1-4) & 40.1 & 13.815 \\
\hline
San-ming Publisher & 19 & 29 & 12 & 72 & 0.341 \\
\hline
Fu-hsin Publisher & 15 & 28 & 39 & 72 & 25.83 \\
\hline
Tung-hua Publisher & 14 & 42 & 16 & 64 & 17.64 \\
\hline
Hai-kuo Publisher & 8 & 41 & 15 & 90 & 13.87 \\
\hline
Tai-hai Publisher & 17 & 36 & 37 & 84 & 35.2 \\
\hline
Hwang-chiu Publisher & 31 & 50 & 3 & \\
\end{array}
\]

\[
\begin{align*}
&df = 1, \quad x^2_{.999(1)} = 10.837 \\
&x^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 42.57 \\
&42.57 > 10.837
\end{align*}
\]

Most of the students have interest in using a language center.

Question 13. Does your junior college have language center (or audio-visual center)? (a) yes or (b) no. (the eighth question of student’s questionnaire)

I used 22 junior colleges as analyzing factor:

\[
\begin{array}{c|c|c|c|c|c}
(a) & (b) & \text{Total} & x^2 & x^2_{.95(1)} & x^2_{.99(1)} \\
\hline
12 & 10 & 22 & 12 & 3.841 & 0.18 < 3.841 \\
\hline
f_o & f_o & & & & \\
\\hline
11 & 11 & & & &
\end{array}
\]

Only 45% junior colleges have such facilities. It means the number of schools equipped with L.L. is not significant.
Question 14  If the lessons of news and science fiction are added in a textbook, do you think it will increase your learning interest? (a) yes or (b) no. (the thirteenth question of student’s questionnaire)

\[
\begin{array}{ccc}
(a) & (b) & \text{df} = 1, \chi^2_{.999(1)} = 10.837 \\
180 & 41 & 221 \\
110.5 & 110.5 & 221
\end{array}
\]

\[
\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 87.43 > 10.837
\]

This is an attempt to find out a way to increase the interest of studying, and I have found that students have strong interest in daily news and science fiction. If the textbook includes more of this type of articles, it will be helpful for students.

Question 15  Using an English textbook of specialized technical courses in those senior years, do you think it will help to build up your English ability? (a) helpful (b) no help or (c) obstacle in learning. (the fourteenth question of student’s questionnaire)

\[
\begin{array}{ccc}
(a) & (b) & (c) & \text{df} = 2, \chi^2_{.999(2)} = 13.815 \\
143 & 39 & 39 & 221 \\
73.7 & 73.7 & 73.7 & 221
\end{array}
\]

\[
\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} = 97.84
\]

\[
97.84 > 13.815
\]

From the result, I got firm conclusion that students felt that using an English textbook in specialized technical course would help their English ability, and would not obstruct the learning of specialized knowledge. However, whether this is true or not needs more further studies.

4.2 The analysis of continuity and the degree of difficulty of textbooks

From the previous section, the analysis result of questionnair shows that most students feel: (1) having poor background in junior middle school, (2) the degree of difficulty in English textbook used in their junior colleges is fair (or easy) and (3) they do have difficulty in learning English. If these result really exist, the reason and the source of this problem (difficulty in learning English) should be found out. First of all, I must understand the content of English textbooks used in junior middle school, and then, check the connection and continuity of English textbooks between junior middle school and junior college of technology. There are three ways to analyze the degree of difficulty in English textbooks already described in the section of
Table 4-2
Comparison of the selected English textbook used in the last semester of junior middle school with different published textbooks used in the first semester of the 5-year program junior college of technology

<table>
<thead>
<tr>
<th>Name of publisher T-unit value</th>
<th>Vol.2 of selected English textbook in junior middle school</th>
<th>Tung-hua</th>
<th>Hai-kuo</th>
<th>San-ming</th>
<th>Fu-hsin</th>
<th>Tai-hai</th>
<th>Hwang-chiu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson 1</td>
<td>1.31</td>
<td>1.86</td>
<td>0.96</td>
<td>1.15</td>
<td>1.35</td>
<td>1.16</td>
<td>2.36</td>
</tr>
<tr>
<td>Lesson 2</td>
<td>1.8</td>
<td>1.51</td>
<td>1.23</td>
<td>1.53</td>
<td>1.39</td>
<td>2.04</td>
<td>1.68</td>
</tr>
<tr>
<td>Lesson 3</td>
<td>2.30</td>
<td>2.1</td>
<td>1.83</td>
<td>2.5</td>
<td>1.38</td>
<td>2.09</td>
<td>1.81</td>
</tr>
<tr>
<td>Lesson 4</td>
<td>2.21</td>
<td>1.71</td>
<td>1.6</td>
<td>1.67</td>
<td>1.21</td>
<td>1.65</td>
<td>1.24</td>
</tr>
<tr>
<td>Lesson 5</td>
<td>1.23</td>
<td>1.59</td>
<td>1.19</td>
<td>1.41</td>
<td>1.72</td>
<td>1.86</td>
<td>2.25</td>
</tr>
<tr>
<td>Lesson 6</td>
<td>2.0</td>
<td>1.64</td>
<td>1.10</td>
<td>2.03</td>
<td>1.72</td>
<td>1.5</td>
<td>1.37</td>
</tr>
<tr>
<td>Lesson 7</td>
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<td>1.53</td>
<td>1.40</td>
<td>2.0</td>
<td>1.83</td>
<td>1.42</td>
<td>1.37</td>
</tr>
<tr>
<td>Lesson 8</td>
<td>2.91</td>
<td>1.29</td>
<td>1.48</td>
<td>1.45</td>
<td>1.35</td>
<td>2.16</td>
<td>1.94</td>
</tr>
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<td>1.39</td>
<td>1.6</td>
<td>1.93</td>
<td>1.33</td>
<td>1.42</td>
<td>1.68</td>
</tr>
<tr>
<td>Lesson 10</td>
<td>2.0</td>
<td>1.52</td>
<td>1.58</td>
<td>2.08</td>
<td>1.14</td>
<td>1.39</td>
<td>1.64</td>
</tr>
<tr>
<td>Lesson 11</td>
<td>1.35</td>
<td>1.78</td>
<td>1.44</td>
<td>1.0</td>
<td>1.39</td>
<td>1.72</td>
<td>1.83</td>
</tr>
<tr>
<td>Lesson 12</td>
<td>2.21</td>
<td>1.93</td>
<td>1.36</td>
<td>1.65</td>
<td>1.7</td>
<td>1.35</td>
<td>1.71</td>
</tr>
<tr>
<td>Lesson 13</td>
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<td></td>
<td>1.79</td>
<td>1.59</td>
<td>1.57</td>
<td></td>
</tr>
<tr>
<td>Lesson 14</td>
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<td></td>
<td>1.73</td>
<td>1.29</td>
<td>2.08</td>
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</tr>
<tr>
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<td>1.3</td>
<td>3.29</td>
<td></td>
<td></td>
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<td>12</td>
<td>13</td>
<td>12</td>
<td>15</td>
<td>12</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>$\Sigma x$</td>
<td>23.86</td>
<td>21.56</td>
<td>16.77</td>
<td>25.22</td>
<td>17.51</td>
<td>25.82</td>
<td>24.53</td>
</tr>
<tr>
<td>$\Sigma x^2$</td>
<td>50.18</td>
<td>36.4</td>
<td>33.99</td>
<td>24.5</td>
<td>26.19</td>
<td>48.22</td>
<td>44.36</td>
</tr>
<tr>
<td>$\bar{x}$</td>
<td>1.99</td>
<td>1.66</td>
<td>1.4</td>
<td>1.68</td>
<td>1.46</td>
<td>1.72</td>
<td>1.75</td>
</tr>
<tr>
<td>$s_p^2$</td>
<td>0.147</td>
<td>0.154</td>
<td>0.196</td>
<td>0.154</td>
<td>0.26</td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>$t$</td>
<td>2.156</td>
<td>3.69</td>
<td>1.812</td>
<td>3.312</td>
<td>1.35</td>
<td>1.48</td>
<td></td>
</tr>
</tbody>
</table>
methods of study. First, comparison of average T-unit values; secondly, comparison of words per clause; and thirdly, comparison of number of vocabulary words. The analyzed data and results of difference test in average number are listed in Table 4-2 through Table 4-7.

4.2.1 Comparison of average T-unit values

From Table 4-2, one can see that the average T-unit value of the selected English textbook in junior middle school is larger than that of

<table>
<thead>
<tr>
<th>Volume</th>
<th>Second semester of third year</th>
<th>First semester of third year</th>
<th>Second semester of second year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson 1</td>
<td>1.31</td>
<td>2.31</td>
<td>1.1</td>
</tr>
<tr>
<td>Lesson 2</td>
<td>1.8</td>
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<td>1.04</td>
</tr>
<tr>
<td>Lesson 3</td>
<td>2.30</td>
<td>1.41</td>
<td>1.25</td>
</tr>
<tr>
<td>Lesson 4</td>
<td>2.21</td>
<td>1.04</td>
<td>1.2</td>
</tr>
<tr>
<td>Lesson 5</td>
<td>1.23</td>
<td>1.37</td>
<td>1.4</td>
</tr>
<tr>
<td>Lesson 6</td>
<td>2.0</td>
<td>1.78</td>
<td>1.33</td>
</tr>
<tr>
<td>Lesson 7</td>
<td>2.44</td>
<td>1.58</td>
<td>2.09</td>
</tr>
<tr>
<td>Lesson 8</td>
<td>2.91</td>
<td>2.05</td>
<td>1.53</td>
</tr>
<tr>
<td>Lesson 9</td>
<td>2.1</td>
<td>1.86</td>
<td>1.32</td>
</tr>
<tr>
<td>Lesson 10</td>
<td>2.0</td>
<td>1.42</td>
<td>1.23</td>
</tr>
<tr>
<td>Lesson 11</td>
<td>1.35</td>
<td>1.39</td>
<td>1.4</td>
</tr>
<tr>
<td>Lesson 12</td>
<td>2.21</td>
<td>2.18</td>
<td>2.09</td>
</tr>
<tr>
<td>N</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>( \Sigma x )</td>
<td>23.86</td>
<td>20.79</td>
<td>16.98</td>
</tr>
<tr>
<td>( \Sigma x^2 )</td>
<td>50.18</td>
<td>37.58</td>
<td>25.33</td>
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<tr>
<td>( \bar{x} )</td>
<td>1.99</td>
<td>1.73</td>
<td>1.415</td>
</tr>
<tr>
<td>( s_p^2 )</td>
<td>0.195</td>
<td></td>
<td>0.13</td>
</tr>
<tr>
<td>( t )</td>
<td>1.44</td>
<td></td>
<td>2.142</td>
</tr>
</tbody>
</table>
the English textbooks by Tung-hua, Hai-kuo, San-ming and Fu-hsin but close to that of the English textbooks by Tai-hai and Hwang-chiu used at twenty different junior colleges of technology. In other words, the selected English textbook used in the second semester of the third year of junior middle school has more complicated structure than those used in the first year of junior college of technology. From Table 4-3, the result of analysis shows that there is no great difference between the first and the second semester of the third year in the average T-unit value. However, there is a significant difference in the average T-unit value between the second semester of the second year and the first semester of the third year. The difference reaches 0.025 significant level. This means that the structure of the sentences in the textbook of the first semester in the third year is more difficult than that of the second semester in the second year. This is the possible disconnection point which leads to the difficulty in learning English.

4.2.2 The comparison of the average number of words per clause

The second method of analyzing the degree of difficulty in English structure is to calculate the average number of words per clause in an article. As the previous comparison, I analyzed the textbooks of the first semester of the first year in junior colleges of technology and that of the second semester of the third year in junior middle school. The result is shown in Table 4-4. It is obvious that there is no significant difference in the average length of clauses between English textbook of the second semester of the third year in junior middle school and those of the first semester of the first year in junior college of technology. As the comparison of average T-unit value, I also used the first semester of the third year as a standard to compare the average words per clause (w/c value) of English textbooks of the last three semesters in junior middle school. Table 4-5 shows the result.

Based on average number difference test, there is no obvious difference in average w/c value between the first and the second semesters of the third year. However, there is an $\alpha=0.025$ significant difference between the second semester of the second year and the first semester of the third year in junior middle school. In other words, on w/c growth, there is a disconnection point between the second semester of the second year and the first semester of the third year in junior middle school.
Table 4–4
Comparison of the average words/clause value of the
English textbook used in the last semester of
junior middle school with different
published textbooks used in the
first semester of the 5-year
program junior college
of technology

<table>
<thead>
<tr>
<th>Name of publisher</th>
<th>Vol.2 of selected English textbook in junior middle school</th>
<th>Tunghua</th>
<th>Haiduke</th>
<th>Sanming</th>
<th>Fushin</th>
<th>Taichai</th>
<th>Hwangchiu</th>
</tr>
</thead>
<tbody>
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<td>7.06</td>
<td>5.67</td>
<td>9.17</td>
<td>7.15</td>
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<td>9.3</td>
<td>6.95</td>
<td>8.11</td>
<td>4.8</td>
</tr>
<tr>
<td>Lesson 3</td>
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<td>6.44</td>
<td>7.06</td>
<td>5.79</td>
<td>6.76</td>
<td>8.72</td>
<td>4.82</td>
</tr>
<tr>
<td>Lesson 4</td>
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<td>6.40</td>
<td>8.82</td>
<td>5.97</td>
<td>5.86</td>
<td>5.83</td>
<td>8.17</td>
</tr>
<tr>
<td>Lesson 5</td>
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<td>5.93</td>
<td>5.88</td>
<td>5.64</td>
<td>7.35</td>
<td>6.57</td>
<td>6.31</td>
</tr>
<tr>
<td>Lesson 6</td>
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<td>6.25</td>
<td>6.61</td>
<td>7.3</td>
<td>8.19</td>
<td>7.17</td>
</tr>
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<td>Lesson 7</td>
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<td>4.74</td>
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<td>7.56</td>
<td>5.31</td>
</tr>
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<td>Lesson 8</td>
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<td>5.47</td>
<td>6.85</td>
<td>5.42</td>
<td>6.30</td>
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</tr>
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<td>10.0</td>
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<td>13.69</td>
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<td>Lesson 11</td>
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<td>6.21</td>
<td>4.87</td>
<td>10.75</td>
<td>6.57</td>
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<td>6.0</td>
<td>6.32</td>
<td>8.17</td>
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<td>8.28</td>
<td>6.79</td>
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<td></td>
<td>9.21</td>
<td>7.14</td>
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<td>12</td>
<td>13</td>
<td>12</td>
<td>15</td>
<td>12</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>$\Sigma$</td>
<td>87.99</td>
<td>97.54</td>
<td>76.63</td>
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<td>81.43</td>
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<td>90.62</td>
</tr>
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</tr>
<tr>
<td>$\bar{x}$</td>
<td>7.33</td>
<td>7.5</td>
<td>6.39</td>
<td>7.6</td>
<td>6.79</td>
<td>7.6</td>
<td>6.47</td>
</tr>
<tr>
<td>$s_p^2$</td>
<td>3.02</td>
<td>2.86</td>
<td>3.65</td>
<td>2.11</td>
<td>3.82</td>
<td>2.38</td>
<td></td>
</tr>
<tr>
<td>$t$</td>
<td>0.24</td>
<td>1.36</td>
<td>0.364</td>
<td>0.92</td>
<td>0.35</td>
<td>1.24</td>
<td></td>
</tr>
</tbody>
</table>
Table 4-5
Comparison of the average w/c value of English textbooks used in the different semesters in junior middle school

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Volume of words per clause</th>
<th>Second semester of third year</th>
<th>First semester of third year</th>
<th>Second semester of second year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson 1</td>
<td>6.0</td>
<td>5.0</td>
<td>2.33</td>
<td></td>
</tr>
<tr>
<td>Lesson 2</td>
<td>8.31</td>
<td>8.78</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Lesson 3</td>
<td>8.57</td>
<td>7.13</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>Lesson 4</td>
<td>6.53</td>
<td>6.5</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Lesson 5</td>
<td>5.8</td>
<td>5.39</td>
<td>6.25</td>
<td></td>
</tr>
<tr>
<td>Lesson 6</td>
<td>8.63</td>
<td>5.03</td>
<td>5.11</td>
<td></td>
</tr>
<tr>
<td>Lesson 7</td>
<td>7.52</td>
<td>8.58</td>
<td>4.86</td>
<td></td>
</tr>
<tr>
<td>Lesson 8</td>
<td>5.47</td>
<td>5.2</td>
<td>7.29</td>
<td></td>
</tr>
<tr>
<td>Lesson 9</td>
<td>9.5</td>
<td>4.72</td>
<td>4.08</td>
<td></td>
</tr>
<tr>
<td>Lesson 10</td>
<td>7.6</td>
<td>8.1</td>
<td>4.29</td>
<td></td>
</tr>
<tr>
<td>Lesson 11</td>
<td>7.09</td>
<td>6.5</td>
<td>6.64</td>
<td></td>
</tr>
<tr>
<td>Lesson 12</td>
<td>6.97</td>
<td>7.75</td>
<td>6.74</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Σ</td>
<td>87.99</td>
<td>78.68</td>
<td>63.42</td>
<td></td>
</tr>
<tr>
<td>Σx²</td>
<td>682.55</td>
<td>540.47</td>
<td>357.41</td>
<td></td>
</tr>
<tr>
<td>x̄</td>
<td>7.33</td>
<td>6.56</td>
<td>5.285</td>
<td></td>
</tr>
<tr>
<td>s²</td>
<td>2.82</td>
<td>2.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t</td>
<td>1.116</td>
<td></td>
<td>2.153</td>
<td></td>
</tr>
</tbody>
</table>

\[ t_{.95(22)} = 1.717 \]
\[ t_{.975(22)} = 2.074 \]
4.2.3 Comparison of the number of vocabulary words (including phrases)

The vocabulary words here mean that the new vocabulary words appearing in each English lesson are the literature symbols needed to be memorized. In other words, the comparison of the numbers of vocabulary words is equal to that of the quantity of memory burden.

For this reason, those phrases which students often used and memorized are counted as vocabulary words. As junior college students are at the age of increasing their memory; it will not be an obstacle in learning either to have some disconnection problems in the change of the amount of vocabulary words used in the textbooks between two semesters.

The analysis on the said materials, see Table 4–6, shows that there is an increase in the average numbers of the vocabulary words of the textbooks used by the first year junior college students compared with those of the textbook used by the third year junior middle school students, but of the textbooks published by Hai-kuo, Tai-hai and San-ming also used by the former, the numbers of vocabulary words do not increase obviously. The number of vocabulary words of the textbook published by Fu-hsin compared with that of the textbook for the third year junior middle school students increase up to 56%. However, the questionnaires indicate among those three junior colleges which used the Fu-hsin textbook, there are 60%, 40% and 50% students (respectively for Fu-hsin, Chien-hsin and Nan-jeng junior colleges of technology) feel that the foregoing textbook is proper for the use of junior colleges; 30%, 36% and 28% students feel that this textbook is simple; and only 10%, 24% and 22% students feel it is very difficult. From those statistics, I deeply realize that the increase in vocabulary words has nothing to do with the capacity of English-learning because those first year students have very strong memory despite the number of vocabulary words in the textbooks.

From Table 4–7, the number of vocabulary words in the textbook of the second semester of the second year is greater than that of the textbook of the first semester of the third year. But there is no significant difference in the average number test.

4.2.4 Discussion on the analysis of the continuity problems

Based on those average T-unit values, w/c values and analysis on the increase of the average numbers of vocabulary words in the textbooks, I have made a conclusion that there is no textbooks disconnection problem from junior middle school to junior college of technology,
Table 4-6
Comparison of vocabulary words in English textbooks
between the second semester of the third year
in junior middle school and the first
semester of first year in junior
college of technology

<table>
<thead>
<tr>
<th>Name of book</th>
<th>Vol. 2 of selected English textbook in junior middle school</th>
<th>Tung-hua</th>
<th>Hai-kuo</th>
<th>San-ming</th>
<th>Fu-hsien</th>
<th>Tai-hai</th>
<th>Huang-chiu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson 1</td>
<td>20</td>
<td>22</td>
<td>15</td>
<td>24</td>
<td>27</td>
<td>31</td>
<td>41</td>
</tr>
<tr>
<td>Lesson 2</td>
<td>26</td>
<td>20</td>
<td>12</td>
<td>22</td>
<td>36</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>Lesson 3</td>
<td>28</td>
<td>29</td>
<td>16</td>
<td>19</td>
<td>28</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td>Lesson 4</td>
<td>21</td>
<td>36</td>
<td>18</td>
<td>32</td>
<td>37</td>
<td>22</td>
<td>33</td>
</tr>
<tr>
<td>Lesson 5</td>
<td>28</td>
<td>23</td>
<td>29</td>
<td>18</td>
<td>56</td>
<td>23</td>
<td>30</td>
</tr>
<tr>
<td>Lesson 6</td>
<td>13</td>
<td>26</td>
<td>23</td>
<td>17</td>
<td>46</td>
<td>17</td>
<td>41</td>
</tr>
<tr>
<td>Lesson 7</td>
<td>27</td>
<td>21</td>
<td>39</td>
<td>26</td>
<td>41</td>
<td>28</td>
<td>40</td>
</tr>
<tr>
<td>Lesson 8</td>
<td>21</td>
<td>29</td>
<td>17</td>
<td>16</td>
<td>31</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>Lesson 9</td>
<td>24</td>
<td>34</td>
<td>29</td>
<td>39</td>
<td>41</td>
<td>52</td>
<td>38</td>
</tr>
<tr>
<td>Lesson 10</td>
<td>24</td>
<td>31</td>
<td>23</td>
<td>42</td>
<td>34</td>
<td>48</td>
<td>55</td>
</tr>
<tr>
<td>Lesson 11</td>
<td>28</td>
<td>39</td>
<td>23</td>
<td>40</td>
<td>39</td>
<td>23</td>
<td>44</td>
</tr>
<tr>
<td>Lesson 12</td>
<td>30</td>
<td>37</td>
<td>30</td>
<td>24</td>
<td>37</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>Lesson 13</td>
<td>34</td>
<td></td>
<td></td>
<td>27</td>
<td>36</td>
<td>36</td>
<td>49</td>
</tr>
<tr>
<td>Lesson 14</td>
<td></td>
<td>39</td>
<td>22</td>
<td>3</td>
<td>30</td>
<td></td>
<td></td>
</tr>
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<td>15</td>
<td>17</td>
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<td></td>
</tr>
<tr>
<td>N</td>
<td>12</td>
<td>13</td>
<td>12</td>
<td>15</td>
<td>12</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>$\Sigma x$</td>
<td>290</td>
<td>414</td>
<td>274</td>
<td>385</td>
<td>453</td>
<td>404</td>
<td>513</td>
</tr>
<tr>
<td>$\Sigma x^2$</td>
<td>7260</td>
<td>12760</td>
<td>6928</td>
<td>11926</td>
<td>17799</td>
<td>12210</td>
<td>19839</td>
</tr>
<tr>
<td>$\bar{x}$</td>
<td>24.17</td>
<td>29.57</td>
<td>22.84</td>
<td>25.67</td>
<td>37.75</td>
<td>26.9</td>
<td>36.6</td>
</tr>
<tr>
<td>$s_p^2$</td>
<td>32.05</td>
<td>29.53</td>
<td>41.84</td>
<td>43.18</td>
<td>63.19</td>
<td>53.87</td>
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</tr>
<tr>
<td>$t$</td>
<td>2.425</td>
<td>0.6</td>
<td>0.40</td>
<td>5.062</td>
<td>1.26</td>
<td>3.14</td>
<td></td>
</tr>
</tbody>
</table>

58
Table 4-7
Comparison of numbers of vocabulary words in the textbook of the third year with the second semester of the third year and the second semester of the second year in junior middle school

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Volume Number of vocabulary words</th>
<th>Second semester of third year</th>
<th>First semester of third year</th>
<th>Second semester of second year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson 1</td>
<td>20</td>
<td>19</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Lesson 2</td>
<td>26</td>
<td>29</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Lesson 3</td>
<td>28</td>
<td>24</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Lesson 4</td>
<td>21</td>
<td>19</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Lesson 5</td>
<td>28</td>
<td>29</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Lesson 6</td>
<td>13</td>
<td>37</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Lesson 7</td>
<td>27</td>
<td>27</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Lesson 8</td>
<td>21</td>
<td>18</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Lesson 9</td>
<td>24</td>
<td>19</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Lesson 10</td>
<td>24</td>
<td>20</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Lesson 11</td>
<td>28</td>
<td>21</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Lesson 12</td>
<td>30</td>
<td>24</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>$\Sigma x$</td>
<td>290</td>
<td>286</td>
<td>338</td>
<td></td>
</tr>
<tr>
<td>$\Sigma x^2$</td>
<td>7260</td>
<td>7180</td>
<td>10080</td>
<td></td>
</tr>
<tr>
<td>$\bar{x}$</td>
<td>24.17</td>
<td>23.83</td>
<td>28.17</td>
<td></td>
</tr>
<tr>
<td>$s_p^2$</td>
<td>27.985</td>
<td>39.17</td>
<td>1.697</td>
<td></td>
</tr>
<tr>
<td>t</td>
<td>0.15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
partly because the number of vocabulary words is not a burden for them; partly because the lessons are less difficult than those in the textbooks for the third year junior middle school students. There is a significant difference on average T-unit values and w/c values, so the real disconnection problem appears at the period between the second semester of the second year and the first semester of the third year in junior middle school. Thus, the result of the student's questionnaires has clearly shown the problem in English-learning in two ways: One is the background knowledge of the junior middle school student is not enough for the advanced studies in English even if the junior college textbooks are proper; the other, the English teaching in junior middle school is seemingly frustrated on account of the disconnection problem.

4.3 How to improve the teaching method

Besides 44% students' feeling their poor English background knowledge before entering junior college, the result of the previous survey of the third question of the student's questionnaire has told me another 39% students' feeling that they cannot adapt themselves to the teaching methods. There is no detailed information about the teaching method in each school. However, there are common problems of current English teaching of 5-year program at junior college of technology, as follows:

(1) Large class system
The average number of students of each class in present educational policy is about fifty. Because of the overloading of the class, it would become a serious problem for all the English teachers about "how to increase the amount of English communication per pupil while at the same time coping with excessively large classes." Furthermore, most of the approaches to language teaching which have met with any degree of success, such as the cognitive method, the direct method, etc., in general rely on relatively small classes of ten to fifteen students to be effective at all.

(2) Examination only in writing
Currently each school has uniformed teaching materials and also at the same time uses the same materials for mid-term and final examination. Therefore, teachers will lay stress on students' writing ability only. In other words, this kind of examination and evaluation is against what Gorosh mentioned in 1970 the steering direction of the planning of language instruction in modern society. Gorosh feels that teaching plan should include:
A. 1 Objective
   2 Contents
B. 1 Curriculum
   2 Teaching Techniques
   3 Media
C. 1 Examination and Test
   2 Evaluation
   3 Certificate
The steering is vertical from A to C, from the objectives down to the evaluation. Because of the result of uniformed teaching materials and examination, the steering direction may be reversed. Therefore, even if the percentages of reading, writing, listening and speaking have been proportioned according to the curriculum standard, that English teaching will be steered towards writing rather than reading, listening and speaking owes to the fact that the present examination in English is only writing.

(3) Limited credit hours in English
At present, the average credits for a junior college are about twenty-five per semester, and most of them are designed for special technical training courses. Consequently, there are not enough credits allocated to English. It is only natural that there have been many problems of how to use those limited credits.

(4) Idleness in studies
Junior college students need not prepare themselves for an entrance examination of colleges and universities as senior middle school students do, so they have not much motivation and obligation in English-learning.

For problem 1, the possible solution is to use group work suggested by the questioned teachers, then regular classroom materials and grammatical structures will be integrated into the activities of the groups. For problem 2, teachers can use mid-term examination as an evaluation for other skills otherwise 70% scores defined by writing ability will never be changed. For problem 3, to satisfy the needs of the student indicated in questionnaires is to offer engineering English class and English conversation class in the fourth and the fifty years, thus that may be the sensible solution of the problem of inadequate credit hours. To solve the last problem is that junior college teachers have to impress into their students' mind the following thing:

That English is not a minor course, but a very useful and practical tool by which science and knowledge can be exchanged among nations.
5. CONCLUSION AND SUGGESTION

5.1 Conclusion

In the previous sections, I have described the ways and the methods to understand the current English teaching status of 5-year program of junior college of technology and to investigate the possible problems resulted from the present education system and their possible sources. The conclusions are as follows:

(a) Students have high interest in English learning. The significant level has reached 0.001.

(b) The number of students who have difficulty in English learning is large, and its significant level has also reached 0.001.

(c) Among those who have difficulties in English learning, 53% students feel that their background knowledge in junior middle school is too poor; 39% students feel that their adaptability cannot meet the present English teaching methods; and only 8% students have no interest in English.

(d) As to the third question of what is the sources of their difficulties in teaching, the teachers' choices don't reflect obvious difference, $\alpha$ is over 0.05.

(e) Students feel that the English textbooks of current junior college of technology are adequate or simple. The significant level has reached 0.005. Therefore, the English textbooks of 5-year program of junior college of technology should not be viewed as the cause of difficulty in English-learning.

(f) Students vary on the selection of reading materials. Generally speaking, they prefer conversation and fiction. The significant level has reached 0.001.

(g) There is a great variance between students and teachers toward the current credits of English course. Teachers prefer more credits, but students feel that the present credits are about the right amount. The significant level has reached 0.001.

(h) Although students feel that the actual English credits are enough, most of them wish to have engineering English and English conversation courses in their fourth and fifth years. The significant level has reached 0.001.

(i) Students feel that English conversation ability is the most important of those four skills—listening, writing, reading and speaking. The
significant level has reached 0.001. The conclusion of this question is as same as that of (f) and (h).

(j) The teachers and students have the same point of view on the goal of English-learning. $\alpha$ is over 0.05. They all feel that English teaching should lay emphasis on daily conversation and tools for future profession. Unfortunately, the contents of those textbooks, except that by Fu-hsin Bookstore, don’t meet their requirements.

(k) The students are interested in using a language laboratory to study English. The significant level has reached 0.001. However, only 45% schools have such facilities.

(l) The students feel that their interest in learning English will be increased if the English textbooks cover some articles of news and science fiction. The significant level has reached 0.001.

(m) The students believe that their English ability will be strengthened by using the specialized technical textbooks in English.

(n) Using T-unit values to analyze the degree of difficulty of English textbooks, I have found that the English textbooks of the third year in junior middle school are harder than the first volume English textbooks, especially those published by Tung-hua, Hai-kuo, San-ming and Fu-hsin bookstores, of 5-year program junior college of technology. The significant levels have reached 0.025, 0.01, 0.05 and 0.01 respectively.

(o) The average T-unit value of English textbooks of junior middle school increases obviously between the second semester of the second year and the first semester of the third year in junior middle school. The result difference has showed a 0.025 significant level.

(p) In the comparison of words per clause, I discovered there is no significant difference between volume 1 and 2 textbooks of the third year in junior middle school and the textbook of the first semester of the first year in junior college of technology. $\alpha$ is over 0.05. However, the length of the clauses of English textbooks between volume 2 of the second year and volume 1 of the third year in junior middle school has a 0.025 significant difference level.

(q) In the analysis of the increase of vocabulary words (including phrases) I have discovered that the average vocabulary words of volume 2 of the third year of junior middle school English textbook is less than that of volume 1 English textbook of junior college of technology. However, this increase of vocabulary words has not brought any pressure on the students of junior college of technology. As to the increase of vocabulary words of the English textbooks in junior middle school,
there is no obvious difference between vol. 1 and 2 of the third year and vol. 2 of the second year.

5.2 Suggestion

(a) In the analysis of this survey, I have discovered that students of 5-year program of junior college of technology generally feel difficulty in English-learning and its main cause is partly due to the poor background of English knowledge in junior middle school. Although there are lots of objective factors such as teachers, facilities and learning environment that determine a good training. However, owing to the traditional system of large class and the passive way of teaching, the media of English teaching have become a main factor to determine whether a student has learned or not. The media are those English textbooks. The current English textbooks of junior middle school from volume 1 to volume 4 are required; those of volume 5 and volume 6 are selective, which are chosen to strengthen the English ability of those who plan to continue their studies after graduation. In fact, the English courses in the last year of junior middle school must not be optional if the students plan to attend senior middle school or 5-year program of junior college of technology. Therefore, the transition of the English textbooks of junior middle school from volume 4 to volume 5 has to be smooth even if English is not required. Then, students will have a better understanding. It is based upon the average number of T-unit values and words/clause values to determine whether a textbook is difficult.

(b) There is a big difference on the viewpoint of English class hours. The students feel that the total is just right, the teachers feel that it is not enough. Moreover, the students wish to continue studying engineering English and English conversation in their fourth and fifth years. Therefore, since the 5-year program of junior college of technology and senior middle school educations are the continuous education of junior middle school, a suggestion by Mr. Philip A.S. Sedlak toward our senior middle school English education can be also used as a reasonable reference. His suggestion but my words are:

That the present system which requires six, five and five weekly hours for the first, second and third year in the natural sciences in senior middle school be increased to five required weekly hours concentrating on reading skills plus three optional weekly hours concentrating on speaking/listening skills for each year of senior middle school.
According to Mr. Sedlak, the credits must be 30, concentrating on reading skills for senior middle school students in learning English; the credits allocated at a junior college of technology at present are only 22. So, my suggestion is that besides 4 credits hours in engineering English in the fourth or the fifth study year, there must be 3 optional credits added for conversation training both in the fourth and the fifth study year.

(c) Teachers and students have the same viewpoint on the goal of English-teaching. If "Engineering English" is offered in the fourth or the fifth year to strengthen the reading skill which is related to the student’s future profession, then it is not necessary to emphasize the coordination of the contents of current English textbooks to student's future job interest. However, it would be necessary to consider adding news, daily conversation and articles on science in textbook to increase the learning interest. After all, essay, poetry, etc., would be less attractive to natural science or engineering students than humanities or social science students.

(d) The purpose of specialized technical courses of junior college of technology is not to teach English. If the "Engineering English" course can fit each specialized technical field, then it would be more suitable to use those textbooks in Chinese.

(e) A common problem in teaching foreign language in our country is that we use large class system--fifty students in a class. Many school teachers have suggested that group work method should be recommended. Group meeting, out of the classroom, should be taken care of by extracurricular activities and teachers don’t have to take the responsibility. There may be a better result if the activity can be directed by senior students leading junior students.
6. CONTINUOUS RESEARCH

For about a decade since the 5-year program of junior college of technology has been established, the status of the graduate of this system hasn't been definitely recognized by the society. In 1978, the Ministry of Education held the first Meeting of the Curriculum Revision of Junior College of Technology and set up an educational goal for junior college of technology. The goal is to cultivate the engineering aid for the industry. However, the social status of the graduate of different departments in these colleges is varied mostly depending upon the demanding of the industry. Therefore, there are different ways of saying that how much of special and common knowledge of each graduate of junior college of technology should have. Nevertheless, it cannot be denied that the education of the first half of junior college of technology is equal to that of senior middle school or vocational school, and the education of the second half of junior college of technology is just like that of specialized junior college. In spite of the high or low expectation of the society, the graduate of junior college of technology should have better common knowledge such as English, physics, mathematics, etc., than does the graduate of senior middle school or vocational school. Because of the pressure of the credits of special technical courses, the English teaching of junior college of technology has gradually faded out. That would become a great concern of its bad result. Besides these, all the junior colleges of technology of our country have been divided into private and public schools, and their systems and programs are quite complicated. Due to the financial support of each school is different, the teaching facilities and the result of English teaching are quite different. Therefore, it would be a good means to use an adequate standard curriculum to prevent those schools from having bad result by ineffective teaching methods. However, before setting up a standard curriculum, we have to understand the English level of students prior to their entering junior college of technology, and the demand of the society to our graduates. Thus, based upon the present condition of each school, a reasonable and effective teaching program should be decided. This paper is only a beginning research work on English teaching. There are lots of other researches to be continued. For instance:

(1) A survey on the demands of English ability of different department's graduates on their profession.
(2) Research on the relationship between the contents of English textbooks which are based on the division described in previous sections with the aptitude of the profession and the grades of English class.

(3) Survey on the current English teaching of the 2-year program of junior college of technology; for the purpose of finding out the difference of the English academic accomplishment between the students of 2-year program and of 5-year program of junior college of technology.

(4) Survey on the current English teaching of vocational school which is the background of 2-year program students in junior college of technology.

(5) Research on the contents and terminologies of engineering English for different engineering departments.

(6) Research on uniformed evaluation methods and standards of English on four different skills (reading, writing, listening, and speaking) for graduates of junior college of technology.
FOOTNOTES


3. The Mental Hygiene Center of Kaohsiung Institute of Technology, A report on The Test of The Mooney Problem Check Lists (Taiwan: Kaohsiung Institute of Technology Press, 1980), p. 25.


6. Vocational High School English Readers, Any text published by one of the following four book companies is permitted by our government: The Renaissance Book Co., Wei-shin Book Co., Chung-cheng Book Co., and The Far East Book Co.,


18. Chien Hou and others, English for the Junior Middle School, required course, vol. 4, 2nd ed. (Taiwan: The National Institute for Compilation and Translation, Jan 1982).
19. Chien Hou and others, English for the Junior Middle School, elective course, vol 2, 2nd ed. (Taiwan: The National Institute for Compilation and Translation, Jan. 1980).
Appendix 1

各位同學：根據目前之調查結果，顯示工專學生之英文程度遠低於一般大學生，尤其預官考
試之差距更大。而七十一學年度開始之新課程標準中英文之學分又有更改。今為
發掘工專學生英文之性向起見，擬請同學們不吝填此問卷，並請班長彙集後，利
用回郵遞交高雄工專。以便作全盤改進英文教學之依據。

（ ）1. 您對英文之學習感到(1)有趣(2)無趣。
（ ）2. 您對學習英文是不是覺得困難？(1)是(2)沒有。
（ ）3. 若有困難是因為(1)以前底子不好(2)課本太深(3)教學方法無法適應(4)課本太
深(5)並無困難。
（ ）4. 貴校使用之教科書是否(1)太難(2)簡單(3)恰好。
（ ）5. 貴校除使用英文教科書外，是否有其他輔助用書(1)有(2)沒有。

教科書局名：
文法書名：

（ ）6. 您覺得學習英文首重(1)聽力(2)閱讀力(3)會話能力(4)書寫能力。
（ ）7. 您有否興趣利用語言中心（或視聽中心）學習英語(1)有(2)沒有。
（ ）8. 貴校有沒有語言（或視聽）中心(1)有(2)沒有。
（ ）9. 貴校有沒有(1)恰好(2)不夠(3)太多。
（ ）10. 您認為四、五年級是否該繼續學習(1)工程英文(2)英語會話(3)工程英文(4)
隨便(5)不必。
（ ）11. 您認為學習英文最主要(1)瞭解歐美西方文化(2)學習英文日常用語及習作(3)為將來就
業所需。
（ ）12. 英文課文中，您喜歡閱讀的英文文章是（多重選題）(1)抒情文(2)小說(3)小品詩歌(4)
敘述文(5)論説文(6)應用文(7)會話(8)傳記。
（ ）13. 課文中若加入時事與科幻文章，您認可不認可提高學習興趣(1)是(2)否。
（ ）14. 您認為高年級專業課程使用原文書對英文能力(1)有幫助(2)無幫助(3)妨礙學習。
（ ）15. 在學習英文課程時，每學期平均可以學習之課文(1)七課以下(2)八課(3)九課(4)十課(5)
十課以上。
Appendix 2

鈞啟者：本調查問卷之目的在探討五專英文教學之目標、方法與成效。今新課程標準之英文
學分減少，是否會導致學生學習效果之低落，以及教學上有所困難。請您賜教以謀
求適當的改善辦法。

（ ）1. 您認為目前五專學生入學前之英文基礎是否能接受目前之英文教學方法(1)能(2)不能
(3)差不多可以。

（ ）2. 目前英文教學最困難處，您認為是(1)學生程度不足(2)學分不足(3)教材不適當(4)學生
不感興趣。

（ ）3. 您認為專科英文教學上最主要是傳授(1)歐美西方文化(2)日常用語、書寫英文(3)就業
時之語言工具。

（ ）4. 貴校現有之英文教科書，對工讀生而言(1)太難(2)恰併(3)太淺。

（ ）5. 您認為語言中心之輔助教材，是否有利於教學(1)有(2)沒有(3)因學生而異。

（ ）6. 貴校有無語言（或聽聽）中心(1)有(2)沒有(3)計劃中。

（ ）7. 學生對英文學習是否有興趣(1)有(2)沒有(3)因人而異。

（ ）8. 您是否有引發學生學習英文之高見？(1)有(2)沒有 若有請填寫：

（ ）9. 您認為四、五年級是否該增開工程英文之選修課(1)要(2)不要(3)可有可無。

（ ）10. 您認爲目前英文學分(1)恰併(2)不夠(3)太多。

（ ）11. 您希望英文課程應該延長到____年級，學分應增為____學分。
工業專科學校英文教學之探討以及與國中英文教學銜接問題之研究

涂雪娥

摘 要

為配合國家工業化，近年來成立許多的工業專科學校，其課程與教學尚在不斷地研究修訂中。英文課程是在各學科中約占 10 %學分的重要必修科目。目前預科考試等各方面，都覺得其教學上有些困難的徵兆。但是由於缺乏適當的評估方法，不能確切地明白問題的癥結所在。故本研究就以問卷方式調查學生與老師對英文教學問題之看法，瞭解困難的現況與原因。再用量化的方式統計評估英文教材，尋求教學學習上的可能斷點，作為檢討改進的參考。

研究的結果，大致上目前五專的英文教材沒有學習障礙，但是在國中英文教材上，卻發現有顯著的步級變化，導致五年制工專學生普遍感到“國中英文基礎不好”。其次，在教學方法上，學生與老師都感到需要改進。但以目前的教學制度，不太可能實現其理想。由問卷調查得知，學生們對英語會話以及工程英文都有熱切的學習興趣，期望在四、五年級能增開選修課。本文僅希望對五年制工專英文教學有深入的瞭解，並提供再深入研究之參考。
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