

ENGLISH LANGUAGE TEACHING AT THE COLLEGE OF ENGINEERING OF CHUBU UNIVERSITY

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A BRIEF HISTORY

Internationalization as the nation's policy, and its counterpart, nationalism, have significantly influenced English language teaching in Japan since its doors were opened to the world. The extremes of cyclical emphasis and suppression regarding the teaching of English can be exemplified by the period between 1877 and 1885 when all higher education lectures were delivered in English, German or French as reported by Dr. Nitobe (Omura 1978) and to the Pacific war years when both English language teaching and use were almost totally abolished. These alternate surges brought about by the central government's policy that ranged from near-jingoism to mass importation of foreign culture are reflected to an extent in the varying number of hours of English teaching in the secondary schools.

The present study traces the course of English teaching at one higher educational institute's engineering college¹. It is divided into two parts: first, a historical sketch of the department and second, a description of a current project by three native speaking teachers.

Internationalism, in a way, played a role in shaping the progress of this English Department's program. When the founder² of this university was ready to realize his vision of establishing an engineering institute, he prepared a thorough study which included traveling to the United States and Europe to survey their universities. On the trip this physicist-educator relied on his son's linguistic ability to act as his interpreter. (This son is now the president of the University.) It can be assumed that the founder

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recognized the importance of the need for Japan's engineers and technicians to communicate with the rest of the world, for he lent strong support to the English Department from its outset.

He assembled an English teaching staff that was highly qualified and prominent in its field³. It was a time when Japan was embarking on a period of high economic growth, absorbing and improving on the technologies from abroad. Not only did the nation's industries, burgeoning in the Nagoya area, need personnel that could absorb and comprehend the profusion of Western technical information, they also needed technicians who could communicate with their English speaking counterparts.

Beginning

Language teaching or learning was not easy in those days. The newly arrived college students, after several years of studying English at the intimate middle and high school level, perhaps with some exposure to audio-lingual drills, confronted a different situation. Classes were impersonal and crowded. They sometimes numbered well in excess of 100 students per class. The teacher usually read the textbook aloud and translated each sentence one by one. It is little wonder that the following comment was made by a Japanese university professor. (Akai 1978)

It is often the case that the students' command of English is at its peak when they enroll in college, but tends to regress, reaching its lowest point when they graduate from college.

Conditions, of course, were not that dismal at this institution. Within two years after its founding, students were grouped into levels of English proficiency based on test scores of the previous year. At first there were three levels: A, B, and C in descending order of ability. There was strong opposition to this at that time decrying it as segregation. However, the argument that this was the most effective teaching arrangement based on sound pedagogical principles prevailed. It was soon noted that the B group of students was the least motivated, and rapidly becoming the poorest students. It seemed that they felt secure enough not to worry about failure since there was a whole group below them; yet they felt that trying harder was futile in that there was a superior group above them. This was quickly remedied with the designations of one top group as A and the rest as B₁, B₂, B₃, etc., with no separation as to level.

Freshman Test

There are differences in status among the students that enter this university; some qualify by virtue of passing the University Entrance Exam, others enter from affiliated schools, and there are those who are admitted under special circumstances. The English Department administers the Freshman Test to all entering students. The department staff designs this test by consulting the guidelines for English teaching prescribed to middle schools and high school by the Monbusho. Test questions are carefully selected and arranged in ascending order of difficulty, covering the areas of comprehension, composition and phonetics. Each question corresponds to a proficiency level expected at a certain grade in middle and high school. By carefully analyzing the test results, the department can accurately determine the latitude of English knowledge that the incoming students possess. The teaching materials can then be selected to cover even the bottom level of those entering students.

Another fundamental concept has been to reduce the class size. Although limits to the number of students per English class are announced, the academic administration has tacitly permitted smaller classes even to the extent of bringing in additional part time teachers. These policies and actions may be interpreted as its way of favoring the English Department in view of the circumstantial limitations that beset our teaching.

Comparisons

Between 1868 and 1917, there were but five imperial universities which were attended by a scant 0.3% of the young people. Some of Japan's finest scholars emerged in this period. From 1918 to 1945, sixty private universities came into existence together with twelve new national universities. Only an elite two percent (2.0%) of college aged young people were attending these schools prior to World War II (Hansen 1985). As a result of Japan's present day affluence, approximately forty percent (40%) of college aged people are attending institutions of higher learning. It must follow that, as a group, the university students today are not as motivated, or perhaps, as gifted as the university scholars of yesteryear. Therein lies one limitation. The next point is that a person has been able to and still can get along fine in this Japanese society without the ability to understand or speak English. Thus there is an absence of a strong motivation to learn English; which is the second limitation. However, it is not only that a strong motivation is lacking. The question is, is there any motivation at all in most college students? To

many of them this is the time to relax. It is the short respite between cram schools that culminated in examination hell and the harsh, regimented world that will confront them when they leave this campus. For most students, the learning of English ranks far lower in priority than do club activities, part-time work, or even the studying for other subjects which they are majoring in.

In view of such overwhelming odds against English learning, teachers of the English Department at times feel an uneasiness but also realize that students must somehow be motivated. As early as 1970, second year students were offered a choice of three areas of subject matter. These fields were English study oriented toward (1) science, (2) culture, or (3) current affairs. It was hoped that, given the sense of deciding his own destiny, the student would become interested in as well as feel a commitment to do well in something that he, himself, had chosen.

Banner year

1973 was a banner year for the English Language Department. In May of that year, a sister relationship was established with an old line American university⁴ in the eastern part of that country. The result was a program of English language teachers coming to this institute to conduct oral skills classes. It started with one teacher⁵ the first year and two teachers⁶ the following years. Their stay was usually for two years. The program was highly successful and dovetailed with the second favorable development that happened to this institute that year.

This was the period when the descriptive linguists were in their heyday. (Chastain, p.28) The tide of the audio-lingual approach was sweeping through the world's language teaching professions. Many of this country's top universities were installing Language Laboratories (LLs); however, it was almost unheard of for a technical institute to invest heavily in sophisticated language apparatus. When this college put in its elaborate facility of two 54 seat language laboratories fully equipped with audio as well as video equipment plus a professional recording studio, it was no wonder that so many other schools sent representatives to see the set-up.

Specialized Teaching Material

The teachers from the United States, fresh from their training in the latest audio-lingual teaching techniques, used this equipment to its fullest capacity in producing two

texts for the engineering students. The first was Lingua Pacifica⁷, a textbook with audio tapes, and the second was It's Up to You⁸ in which a video tape was included. The latter is still being used in the LL classes. It is a well structured notional-functional approach which follows established pedagogical patterns of dialogs and structure pattern practice, including pauses in the tapes for the students to repeat or respond. What made these productions so valuable was that they were created specifically for the students here. Commercial tapes made for general university use at the time were usually too difficult for this school's students. The content of tapes whose English was intended for the high school level was often too childish for students of our college. The result was teaching material incorporating this campus's features, with a level of difficulty commensurate with the student's ability and professionally put together. Very few schools in this area can boast of such studio capability or specialized products.

Full Fledged University

This institute of technology took a giant stride in fulfilling the founder's dream when the Monbusho granted it full university status in 1984. Two new colleges, the International Relations College; and Management and Information College, were established to join the Engineering College in forming a new university. This long planned expansion was in response to the needs of Japan's changing role in the world. As the country moves from its established manufacturing base to compete anew in the global high-tech information sciences, properly trained personnel was sure to be needed.

区 分		授 業 科 目	単 位 数	毎 週 授 業 時 間 数								備 考
				I		II		III		IV		
				1	2	3	4	5	6	7	8	
外 国 語 科 目	英 語	英 語 A 1	①	2								C, D, E, F より 4 単位選 択必修
		英 語 A 2	①		2							
		英 語 B 1	①	2								
		英 語 B 2	①		2							
		英 語 C 1	1			2						
		英 語 C 2	1				2					
		英 語 D 1	1				2					
		英 語 D 2	1					2				
		英 語 E 1	1				2					
		英 語 E 2	1					2				
		英 語 F 1	1				2					
		英 語 F 2	1					2				
		英 語 G 1	1						2			
		英 語 G 2	1							2		

The large increase in faculty for the new disciplines included many foreign language speakers other than English to enrich the Foreign Languages Department. The English Department was augmented by four teachers⁹ who had EFL (English as a Foreign Language) teaching experience. The English Department was called on to serve the two new colleges with this additional faculty as well as to supply an increase in part time teachers. The department's Engineering curriculum was amended to its present form and is shown on the previous page.

Current Curriculum

The basic English requirements of the Engineering College are that first and second year students must take two English classes per week. In the freshman year, the two courses are designated as A_{1,2} or B_{1,2} (1 and 2 merely refer to the first or second semester). In the A_{1,2} group, teaching material is selected by the respective teachers of each class. In the B_{1,2} group, the students are allowed the choice of LL (Language Lab) or comprehensive English. The comprehensive English classes use a common text, English for You (Hattori et al, 1969). When there are more LL applicants than the nine sections can accommodate, those with the highest scores in the Freshman test are given preference. In the A_{1,2}, those with the highest grades in the Freshman test are put in one class.

Before the end of the first year, students are polled as to what areas of English they would prefer to study in their second year. Listed below are the four subjects areas:

- | | |
|------------------|---|
| C _{1,2} | English Literature Studies |
| D _{1,2} | Humanities and Cultural Studies |
| E _{1,2} | Scientific and Technical English |
| F _{1,2} | Aural and Oral Skills with Native Speaking Teachers |

It is at this point that the department takes special pains to accommodate each student's preferences. Although the main programmer has some misgivings as to whether the students are selecting classes because it's an easy credit or if it's because they have a genuine interest in it, in almost all cases the students are granted their first if not second choice. It may be said that this is the heart of the English Department's philosophy; by ministering to the students' wishes, the students' motivation is aroused and a lit-

the more English will be acquired by them.

Third and Fourth Years

With the completion of required courses, in the third year, a G_{1,2} course is offered as an elective. Content varies depending on the students' needs. Included are specialized English for post-graduate work, preparation for English tests given by employers, and TOEFL preparation. Here again, of concern to the teachers is the fact that some students may be taking these courses only to accumulate enough credits for graduation.

Starting in the fall of 1986, a new fourth year program is to be scheduled. This expansion will start with two classes and increase to four classes. The course will be called Technical English but will be further specialized into the following separate engineering disciplines:

- 1 Electrical and Electronics
- 2 Mechanical
- 3 Civil and Architectural
- 4 Chemical and Physics

NOTES I

- 1 Chubu Institute of Technology became College of Engineering at Chubu University in 1984
- 2 Dr. Kohei Miura, founder of Miura Gakuen. Noted Physicist and Educator (1890–1975)
- 3 Professor Shigeru Kawai, Hiroshima Higher Normal School
Assistant Professor Taikan Takagi
Instructor Tetsuo Kido
- 4 Ohio University, Athens, Ohio, Est. 1804
- 5 Mr. Gregg Singer
- 6 Mr. Singer was joined by Miss Domini McCarthy
- 7 Written by Gregg Singer & Domini McCarthy
- 8 Written by Marilyn A. Kalan and Tom Murtha
- 9 Dr. Kazumitsu Kato, Dr. Sumako Kimizuka, Peter High and Shogo Iwasaki

PRESENT PROJECT

Unique Opportunity

At the beginning of the 1986 school year, the previously described F_{1,2} classes were scheduled and assigned to the two native English speaking teachers.¹ Twenty-five students were assigned to each class. Subsequently, another native speaker² became available and was included in the F_{1,2} program. This resulted in the near ideal class size of sixteen to eighteen students for each teacher. A second bonus, as will be shown later, was the availability of the LL (Language Lab) during these class hours.

New Format

Given this unique opportunity, the three teachers were encouraged by the Foreign Languages Department Chairman³ to develop a new format. In a planning session, they sought to address the problems of implementing an innovative program of improving English skills within the curriculum of the Engineering College. This rigorous curriculum makes long class periods necessary to accomodate laboratory and field work which usually meet once a week. For optimum performance in teaching languages, classes should be held much more often and be shorter in duration. Our task was to devise a program that would be the most productive and beneficial for the students within these constraints.

After some brainstorming, a solution was found for the overly long class time to be spent solely on oral skills. With the cooperation of the LL consultant⁴, it was decided that the period would be divided. For the first half of the period the three classes would be combined and meet in the LL with the three teachers team-teaching. For the remaining half, the students would disperse to their respective teacher's classroom. There they would participate in small group activities where more one-on-one interaction with a native speaker teacher was possible.

In the LL, the consultant took charge of all the technical details, leaving the teachers to concentrate on presenting the lesson. The duties of the three teachers were assigned according to their talents. One⁵ gave the preparatory lecture at the beginning of each session as he has done in his previous teaching. The second⁶, with his experience as an announcer for a radio station, made the voice recordings and the third⁷, being

bilingual, interpreted announcements and directions when necessary. While the students were writing responses to the questions and instructions that were being read by one teacher, the other two monitored what the students wrote. The reader would then be signaled to pause or continue. This resulted in the lesson moving along at a rate consistent with each class's ability.

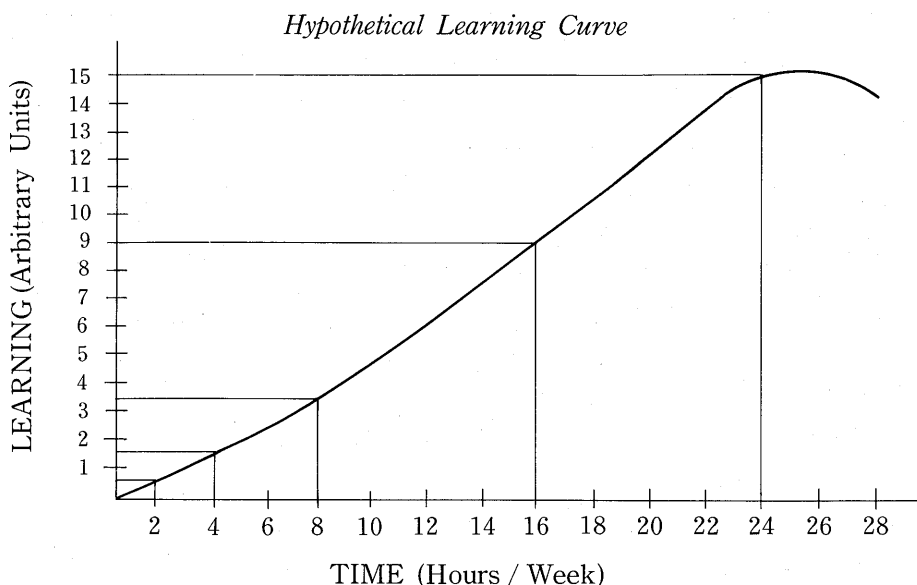
The three teachers agreed that the program was to be basically learner oriented. Overall scholastic ability of the students as well as their scores in the English portion of the entrance examinations were examined. This aided in deciding what level of English would be practicable for explanations and lectures. The students' probable job assignment upon graduation was surmised by looking at the list of companies where previous graduates found employment and by asking professors who have kept contact with former students. The three teachers were then able to decide how much and what type of English communication skills graduates of Chubu University's Engineering College would most likely use in their future work. In attempting to grasp a total picture of the learner, it was even discovered that some students opted for the engineering because of their self perceived inferiority in learning English. They thought that English was imperative in the humanities colleges.

It was obvious that motivation, a vital ingredient in language learning, would have to be nurtured in the engineering student. Lesson content was chosen with an eye toward subjects that would appeal to the future engineer. Included were technical matters having disciplined thought processes such as numerical relationships and spatial concepts. On a lighter side, this effort to motivate the students even went as far as to play tapes of popular American rock music over the LL speaker system before classes started. The hope was to attract as many students to class early and to have them make the psychological association that LL classes were enjoyable.

Once a Week becomes Twice a Week

The number of times a class meets per week has a unique relationship on language learning. As shown below in the Hypothetical Learning Curve (Stevens 1977), doubling the frequency of meetings more than doubles the learning, generally speaking.

With this in mind, homework was assigned at each LL meeting. Since each student was required to get a blank cassette tape onto which the LL lesson was recorded, it was onto this tape that homework questions and problems were recorded at the close of each LL class. The strategem's key was that the written answers and solutions were due



three days after they were assigned. It was assumed that they, as students usually will, would only set about listening to the tapes just before homework was due. This, in effect, exposed the students to language study a second time during the week. The constraint of only meeting once a week was thereby somewhat ameliorated.⁸

The Japanese pupil must have a set of English materials especially adapted to his linguistic needs, if we want him to learn English well. Charles C. Fries, March 1960, Tokyo (Morley, 1984)

As an esteemed pioneer of EFL (English as a Foreign Language) pedagogy in Japan recognized almost two decades ago, the three teachers also felt that the text selection was of crucial importance. They felt the language skill which they would teach should fill a need or gap in the students' previous linguistic study. This shortcoming was answered in a questionnaire to expatriate teachers of English at the 1982 JALT (Japan Association of Language Teachers) International Conference in Osaka. Native English speaking teachers who have taught in Japan for years and who did not have graduate training were asked which area they would like to study in an M. A. (Master of Arts) program. As the following table shows, Teaching of listening was their first choice. The three concurred.

Table 3		
Results by rank to the question:		
If you were to study in an M.A. program in TESL/TEFL, which areas would you like to study? N=75		
	Mean	S.D.
1. Teaching of listening	1.80	0.51
2. Teaching of speaking	1.73	0.57
3. Second language acquisition	1.62	0.56
4. Materials writing / selection / adaptation	1.43	0.69
5. Curriculum / Syllabus design	1.27	0.75
6. Use of A-V aids	1.27	0.71
7. Psycholinguistics	1.25	0.73
8. Sociolinguistics	1.24	0.74
9. Teaching of writing	1.13	0.72
10. Teaching of reading	1.11	0.76
11. Classroom management techniques	1.11	0.75
12. Error analysis	1.10	0.71
13. Practice teaching	1.08	0.88
14. Teacher training	1.01	0.81
15. Language testing	0.98	0.76
16. Discourse analysis	0.90	0.71
17. English grammar and how to teach it	0.88	0.76
18. Administration	0.84	0.80
19. Phonology / Phonetics	0.84	0.71
20. English for Specific Purposes	0.83	0.80
21. First language acquisition	0.82	0.77
22. Use of language lab	0.73	0.75
23. Contrastive analysis	0.73	0.79
24. Varieties of English	0.64	0.70
25. Theoretical linguistics	0.61	0.72
26. Bilingual education	0.57	0.65
27. History of language teaching	0.44	0.64
28. Statistics and research	0.42	0.65
29. English literature	0.36	0.64

Textbook and Coursework

They selected Joan Morely's proven workbook, Improving Aural Comprehension, developed under the auspices of the English Language Institute at the University of

Michigan⁹ (Morley 1971). It presents a structured listening program designed for use in LLs. As Morely states, aural comprehension (or as she defines it, listening with understanding) is difficult for many students. Her explanation was that they tend to forget within a few seconds what they heard and momentarily understood. To cope with this problem the text stresses:

1. directed concentrated listening
2. conscious focusing on remembering
3. immediate writing

The organization of this book is two-fold in that the lesson units are planned around concept areas as well as subject matter. For example, if the concept area is numbers in the millions, the subject matter could be population figures in major metropolitan areas of the world.

For the present project the teachers selected the following concept areas as the most fundamental technical prerequisites:

- * numbers and numerical relations
- * letters, abbreviations and alphabetical order
- * spatial relationships and directions
- * time and temporal sequence

In the transmission of factual information that engineers must deal with, numbers are by far the most used expression. Of course, Arabic numerals have been adopted by all developed countries including Japan. In comparing nomenclature in English and Japanese, however, reading convention of these numbers differ sharply at the ten thousand level and above. Discerning this variance, the teachers set as a basic goal the writing of large numbers promptly and accurately on its first hearing.

Awareness of Cross Cultural Diversities

Merely reading numbers over ten thousand one after another can become tiresome very quickly. It is at this point that subject matter offers new dimensions. If these same numbers were used, for example, to quantify the speakers of various languages throughout the world (as it was in the present project), this usage would provide an access to introducing cultural enrichment. On a world map, the areas where these languages are spoken, what historical events brought about the use of that particular language, and how it differs from English or Japanese can be explained. This would introduce engineering students to a glimpse into the world's diverse cultures. In this manner, by uti-

lizing the subject matter to familiarize the students to the world beyond these islands, the cause of internationalizing this country's emerging generation was hoped to be achieved, even if to only a small degree. The foregoing is what the former chairman of the Foreign Languages Department¹⁰ was referring to, when he counseled the three teachers that university teaching should rise above the level of common commercial language classes. This teaching must go beyond mere acquisition of skills and provide intrinsic cultural enrichment.

Homework

The many purposes of the taped home assignments included not only reinforcing LL work, but also bringing the lesson close to the student's daily life. Most of the questions recorded onto the homework tapes were personal questions. Others were about directions around the Chubu University campus. When such homework was orally reviewed in class, the students would spontaneously respond in English speech. This and other similar exercises were, of course, part of the plan to prepare the students to naturally move into the next skill, appropriate oral responses.

The importance of turning in homework assignments was duly impressed on the students by announcing that their failure to do so would result in their receiving an incomplete for the course. It worked.

Midterm and Final Examination

The first tangible results of this new direction in teaching appeared in the scores of the midterm examination. They were well beyond the expectations of the teachers. The mean of the three combined classes was in the high eighties, even surpassing the accepted norm of 80-85 percent for mastery learning (Chastain 1976, 218). To take a closer look at this four part test, the following were questions # 11 to # 20 of Part I which tested accurate perception and writing of numbers:

#11	8,007	#16	5,427,215
#12	32,651	#17	8,080,910
#13	99,233	#18	46,151,000
#14	738,251	#19	184,735,009
#15	26,126	#20	105,432,646

Can you imagine hearing these numbers spoken to you in an informal American

English dialect at normal speed? Would you be able to write them down as accurately as almost ninety percent of the English F₁ students did? The significance of this result is that in this skill the students achieved mastery learning, which is scoring in the 80 to 85 percent range and above. Chastain points out that mastery learning produces the following benefits, all which are germane to F₁ students.

- (1) Students gain confidence in their ability to learn the material.
- (2) They like the subject better.
- (3) They have a more positive self-concept.

For the balance of the midterm examination, Part 2 asked the student to perform various mathematical computations. Part 3 tested the ability to discriminate between similar sounding letters, and Part 4 required the students to write common abbreviations of engineering terms read to them. Each teacher gave a class quiz in addition to the LL exam. The following questions are examples of what one teacher¹¹ asked.

* Portugal is a small country; yet, why do so many people in the world speak Portuguese ?

* Given the following formula, at what temperature (deg. F) would an American say water (a) freezes, (b) boils ?

$$F = 9/5 C + 32$$

The replies of some of the students, especially to the first question, were so disappointing as to cast a pallor of perplexity to the good results that were also achieved by others.

Although statistical analysis of the midterm results were not made as they were for the final exam, a block graph of the grades distribution outlines a negatively skewed distribution with the measures of central tendency clustered in the high eighties. For the three teachers, it was an important first step forward.

The final examination was constructed with two uses in mind. The first was of course to measure the semester's achievement. The other purpose was to use it as a pretest for students coming into next year's English F_{1,2} class. Comparison of the pretest and the post (or final) test will provide a measure of learning achievement. It will also be a check on what areas were satisfactorily presented as well as where improvement is needed.

How an extensive analysis of the final scores was facilitated is a story in itself. For some time, the LL consultant has been devising a programmed card reader that auto-

matically processes test answers entered on IBM cards. Since this was the first time the students were asked to mark 100 answers spread over two cards, a sample test of five questions was designed and given, with explicit instruction, to each class prior to the actual final exam. It was hoped that the test's reliability and validity would be improved. The miracle of sophisticated software and hardware produced the detailed findings presented at the end of this article. The results, as can be seen, were as satisfying as the results of the midterm. Particularly noteworthy are the Final Exam and the results of its statistical analysis by the LL consultant on page 18.

Definitive statistical discussions and conclusions as found in experimental research papers will not be forthcoming. Since the purpose of the original format was not to prove a hypothesis, there are many shortcomings in sampling, conditions, and design. The benefits of scrutinizing the Final Exam questions were in identifying those which need to be reviewed and if necessary revised by the teachers. Comparing the scoring by the top 25 percentile (labeled U) against the bottom 25 percentile (labeled L) will hopefully strengthen the validity and reliability in the revised tests. A positive correlation between the odd and even numbered questions will make it feasible to reduce the number of questions from 100 to 50. The pretest questions will be different from the final test questions and still constitute a valid comparison. With further study, substantial research results may some day be produced by this program.

Conclusions on this First Semester

After studying English for six to seven years in middle school, high school and one freshman year, the students of $F_{1,2}$ possess a low level of communicable competence in this language. Improving aural comprehension was the goal of this current project. The examination results were encouraging in that they have proven that the skill of listening with understanding of these specific items that we covered can be successfully acquired. Nonetheless, there is much more to listening comprehension than the items that we covered in this class. There is even more to attain a minimum level of communicative competence.

Our next step is to reevaluate what can realistically be accomplished in language learning within the constraints that exist in this setting. For the majority of the students, this is the last English class that is required. To these learners we can encourage that the tapes of the lesson as well as the corrected lessons be kept as a source of reference. Some day in the future there may be both the need as well as an urge to review

what they have learned. To those few students who want to learn more English for graduate work, studying overseas, or to score well in company entrance English exams, we can explain the choices and methods of more English learning. To the rest we can explain that there is a world beyond in which English is not only useful but almost a necessity. Learning English is therefore an integral part of that global education the youth of this world and especially of this country need in order to understand and respect each other's diverse cultural systems.

Special Acknowledgement

A renowned authority of English teaching (Stevens, 159-162) cites the extreme polarity of opinions regarding LL use. Whereas some teachers claim that it is an indispensable tool for language learning, others, who have had disastrous experiences, contend the very opposite. His explanation of this incongruity is that the success or failure of the LL lies in its overall operation, such as maintenance, servicing, teachers' awareness of the lab's capabilities, and adequate materials. In Chubu University's case, the person who provided much of the above to make the LL a success is Mr. Takeshi Oba, the LL consultant. His services were invaluable in conducting the present project, and we teachers wish to thank him. It is obvious that the outstanding productivity of this University's LL heretofore, is due to his expertise. We wish him well in the establishment of the new and even more sophisticated language laboratories that are soon to be constructed.

NOTES II

- 1 They were Jack Humbles from Ohio University and Shogo Iwasaki from California State University, Los Angeles.
- 2 James Lewis from the University of Colorado
- 3 Professor Kiyoshi Aoi
- 4 Mr. Takeshi Oba
- 5 Jack Humbles
- 6 Jim Lewis
- 7 Shogo Iwasaki
- 8 Yet, a far cry from classes meeting everyday and the handing back in the afternoon, of homework which was turned in that morning, as Jack did in his intensive English classes in Ohio.
- 9 The founding director of this highly regarded institute was Charles C. Fries.
- 10 Professor Taikan Takagi
- 11 Shogo Iwasaki

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STATISTICAL RESULTS OF FINAL EXAMINATION

	Total	Class 1	Class 2	Class 3
Attend	245	91	84	70
Mean	87.151	89.110	85.869	86.143
Level(%) ^{*1}	—	1.195	11.401	25.656
S. D	7.434	6.759	7.798	7.289
Maximum	99	99	97	98
Minimum	64	72	64	65
Range	35	27	33	33
Median	89.0	91.0	87.0	88.0
Skewness	−0.883	−0.794	−0.941	−0.851
Level(%) ^{*2}	0.000	0.227	0.058	0.410
Kurtosis	3.391	2.906	3.439	3.227
Level(%) ^{*2}	20.817	85.069	40.070	68.934
Reli.(K.R)	0.848	0.841	0.850	0.837
SEmeas	2.902	2.694	3.022	2.944

Level(%)^{*1} : level of significance, assuming a difference in means

Level(%)^{*2} : level of significance, assuming distribution is not normal

ANALYSIS OF FINAL EXAM QUESTIONS

Q.N.O	Answer	Right(T)	Right(U)	Right(L)	Level(%) ^{*3}
1	3	98.367	96.774	98.387	−55.998
2	2	95.510	98.387	90.323	5.399
3	3	99.592	100.000	100.000	100.000
4	2	94.286	100.000	91.935	2.417
5	2	97.551	100.000	93.548	4.420
6	3	88.571	95.161	85.484	7.081
7	2	95.918	100.000	88.710	0.739
8	2	99.184	100.000	98.387	31.732
9	4	83.265	93.548	67.742	0.040
10	1	86.531	95.161	77.419	0.480
11	7	57.551	83.871	30.645	0.000
12	3	54.694	95.161	20.968	0.000

Q.N.O	Answer	Right(T)	Right(U)	Right(L)	Level(%) * 3
13	5	77.959	98.387	48.387	0.000
14	2	61.224	93.548	35.484	0.000
15	6	96.327	100.000	91.935	2.417
16	1	77.551	100.000	46.774	0.000
17	3	75.918	98.387	48.387	0.000
18	6	56.735	87.097	27.419	0.000
19	4	88.163	98.387	72.581	0.008
20	7	87.347	96.774	69.355	0.008
21	3	97.551	100.000	93.548	4.420
22	8	97.143	98.387	91.935	9.667
23	6	97.959	100.000	96.774	15.647
24	4	77.551	98.387	45.161	0.000
25	3	95.102	100.000	83.871	0.127
26	6	93.469	98.387	83.871	0.524
27	7	85.306	100.000	72.581	0.002
28	1	79.592	91.935	67.742	0.105
29	5	95.918	98.387	88.710	3.017
30	1	81.633	100.000	59.677	0.000
31	2	68.980	82.258	50.000	0.023
32	4	97.959	98.387	95.161	31.137
33	6	95.510	98.387	88.710	3.017
34	5	100.000	100.000	100.000	100.000
35	2	99.592	100.000	98.387	31.732
36	3	71.429	87.097	50.000	0.002
37	3	99.184	98.387	100.000	-31.732
38	5	95.102	100.000	88.710	0.739
39	7	82.449	91.935	72.581	0.559
40	9	91.837	98.387	83.871	0.524
41	2	95.510	100.000	87.097	0.411
42	5	87.347	100.000	62.903	0.000
43	6	92.245	98.387	82.258	0.291
44	1	86.531	95.161	69.355	0.026
45	7	93.469	100.000	80.645	0.039
46	1	36.327	62.903	12.903	0.000

Q.N.O	Answer	Right(T)	Right(U)	Right(L)	Level(%) * 3
47	8	91.429	100.000	74.194	0.004
48	3	86.939	100.000	61.290	0.000
49	6	87.347	98.387	70.968	0.004
50	4	88.980	93.548	75.806	0.701
51	4	99.184	98.387	100.000	-31.732
52	1	97.143	100.000	91.935	2.417
53	3	96.735	98.387	93.548	17.333
54	1	96.327	96.774	96.774	100.000
55	3	99.592	100.000	98.387	31.732
56	1	100.000	100.000	100.000	100.000
57	4	99.592	98.387	100.000	-31.732
58	3	97.143	96.774	93.548	40.422
59	2	97.551	100.000	93.548	4.420
60	2	98.776	100.000	95.161	8.203
61	1	99.592	100.000	98.387	31.732
62	4	100.000	100.000	100.000	100.000
63	2	99.592	100.000	100.000	100.000
64	3	100.000	100.000	100.000	100.000
65	2	92.245	96.774	88.710	8.602
66	1	97.959	100.000	93.548	4.420
67	4	93.469	95.161	87.097	11.685
68	3	97.551	100.000	91.935	2.417
69	2	100.000	100.000	100.000	100.000
70	1	95.918	98.387	96.774	55.998
71	4	93.061	96.774	82.258	0.941
72	1	89.388	100.000	69.355	0.001
73	3	93.878	98.387	79.032	0.089
74	2	98.367	100.000	95.161	8.203
75	3	98.367	100.000	95.161	8.203
76	2	68.980	87.097	51.613	0.004
77	3	86.122	96.774	77.419	0.167
78	1	98.776	100.000	96.774	15.647
79	4	85.306	98.387	67.742	0.001
80	4	65.306	85.484	43.548	0.000

Q.N.O	Answer	Right(T)	Right(U)	Right(L)	Level(%) * 3
81	7	96.327	100.000	91.935	2.417
82	1	97.959	100.000	95.161	8.203
83	4	95.510	100.000	85.484	0.229
84	8	95.918	100.000	88.710	0.739
85	2	94.694	96.774	91.935	24.534
86	3	87.755	93.548	74.194	0.404
87	1	43.673	59.677	20.968	0.002
88	4	57.959	77.419	35.484	0.001
89	2	91.020	96.774	83.871	1.654
90	1	91.429	96.774	83.871	1.654
91	4	81.633	95.161	62.903	0.002
92	3	91.020	90.323	83.871	28.604
93	3	80.000	93.548	62.903	0.007
94	1	84.082	88.710	69.355	0.918
95	2	76.327	93.548	56.452	0.001
96	1	91.020	98.387	83.871	0.524
97	4	66.531	80.645	50.000	0.048
98	3	62.449	79.032	45.161	0.016
99	2	48.163	80.645	19.355	0.000
100	3	24.082	20.968	30.645	-22.053

Level(%) * 3 : level of significance, assuming justifiable difference between upper and lower 25 percentiles