Report on the Evaluation of the English for Science Students Programme at Chiang Mai University

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In June 1978, the first–year English programme at Chiang Mai University[1] was changed so that students from the Humanities and Social Sciences Faculties followed General English courses and students from the science and technology faculties followed English for Science students courses in both the first year (English 191 and 192) add the second year (English 291 and 292). The new English 291 and 292 courses. relating to English 191 and 192 courses in the first year, were introduced in June 1979. Since June 1978, graduate students in science and technology faculties have taken the course English 503[2].

An evaluation of this new programme was designed and carried out in 1979. Those of us involved in the project hoped to measure the quantity and type of English needed by science students and to collect and analyze feedback from English teachers and students of the new course, and from science subject teachers.

Instruments used included questionnaires (for teachers and students) and semester and final tests in the courses under analysis. Two foreign local contract teachers, one teaching chemistry and one biology, together with two Thai teachers, one teaching physics and one agriculture, were requested to select passages and set multiple choice questions on them in consultation with English teachers to make up a test. The purpose of the test was to measure the ability from the subject teacher's point of view of science and technology students to read text–books in English.

A total of four passages were selected and eight multiplechoice questions set on each passage, Subject Teacher Test 1 and 2 were then made up, consisting of two passages each. An evolutionary analysis was also undertaken.

Our samples included all the English teachers involved in the new courses, 54 science subject teachers stratified according to faculty position and countries

studied in, and finally 311 students who were sorted into seven sub-samples according to course and year of study and ability level (determined by course and examination results).

Details concerning the collection and statistical analysis of the data are found on pages 15 through 17 of the report. Copies of the report were made available to the main libraries of all Thai universities and certain tables and pages of its statistics are referred to by number in this summary which is given in hope of bringing the problems and issues of the report to wider academic attention.

Where course difficulty is concerned, English teachers and students agreed that the first year courses were easy but the second year ones relatively difficult. Persaps as a result, most students thought the quantity of course material could be increased in the first year and should be decreased in the second year[3].

English teachers found the second year courses more enjoyable to teach but thought the first year courses were more interesting for students. However, the second year courses appeared to interest students much more than the first[4].

A large proportion of students seemed satisfied with the attitude and effectiveness of their teachers, with upper classmen more satisfied than underclassmen. When ranking the most used teaching methods of their Thai and foreign English teachers, students perceived little difference between the two groups in their use of lecturing, asking questions, games, and repetition drills[5].

Most students felt that the English programme benefitted them at least "a lot," with Reading ranked highest. Following this, Listening and Writing were noted by first-and second-year students, Speaking and Listening by third-and fourth-year students and Writing by graduate students. Students, however, on the whole saw more future than present benefits, with Reading and Further Studies the two highest ranked areas[6].

Student use of English included: *Reading* in text-books, teacher handouts, journals, newspapers; *Reading* for survey, comprehension, speed, extraction of information; *Writing* summaries. reports, descriptions: *Note taking* from texts and lectures : *Listening* to tapes, lectures, radio ; *Speaking* with the emphasis on asking and answering questions, and presenting arguments.

With reference to these subskills, the student responses (which provided direct feedback to course materials) on questionnaires revealed Reading subskills, with the exception of Reading Quickly, were used by a majority with Survey Reading and Reading to Understand becoming particularly important for graduate students. In the area of content, a large proportion of undergraduates used English to read handouts although the figures for the latter vary considerably. Only a low percentage of graduate students read journals in English to any extent. It appeared

that Note taking from lectures was used at least "Quite a lot" by about half of all students, and that Note taking from textbooks was being increasingly used as students went through university. Writing, as such, Listening and Speaking appeared to be little used skills,and both English and science subject teachers seemed to overrate them[7].

The Evaluation Project included an error analysis based on semester and final course tests from the first and second year students that covered reading, writing, and listening skills. Some of our major findings, which we used to revise course materials, teaching methods and the objectives and format of the test questions themselves, will be outlined here in the hope of eliciting comment from other ESP teachers.

For the *Reading* portion of tests in Courses 191 through 292, questions which more than 90% of students answered correctly were of two main types:

1) those requiring students to find the topic of a paragraph

2) simple, direct questions which require the student to extract information presented in the passage, for example:

"What miscible liquids are given as examples?"

In Course 191 and 192, questions which less than 50% of students answered correctly were of five types:

1) longer questions. particularly those where the student could not present an answer directly from the passage, for example:

"From paragraph 2, if alcohol is poured on top of water, why does it take so much time to completely mix together?"

2) questions which relate to a previous question, for example:

"What example is given for the answer to question 21?"

A wrong answer to the first question makes likely a wrong answer to the second.

3) questions on the reference of an item where the information referred to is not simple, for example:

"the underlined word *the latter* refers to_____"

4) questions relating to the shapes and properties of objects, for example:

"List the properties of aluminium and give the advantage of each property."

5) questions which require students to summarise a paragraph.

For Courses 291 and 292, the questions which less than 50% of students answered correctly were of seven types:

1) questions which involve the following of a series of steps related to a method or results, for example :

"How do you determine water content with a Tensiometer?
First——————. Then——————. Next——————"

2) questions which require students to summarise a passage;

3) questions relating to the reference of items, for example :

"What two research projects (line 44) did the astronauts work on in the skylab?"

4) questions concerning advantages and disadvantages, for example :

"In what way does the 'remote' control apparatus have advantages over 'manually' operating one ?"

5) questions where students have to make a comparison or inference, for example :

"State different problems on fortification of food in both passages in terms of *present cost :*
passage 1 : —————————
passage 2 : ————————— "

6) long or complicated questions, for example :

"Why dose using radiation gauges to ensure accurate filling of food containers pose no radiation hazard ?"

7) questions relating to the following language teaching points in the course (in order of difficulty) :

(1) the recognition or production of hypotheses, deductions and evaluations;

(2) the identification of supporting evidence ;

(3) the identification of problems.

In the *Writing* part of the test for 191 we found that the major categories of errors (with the percentage of students making the errors) were :

1) Topic Sentence (94.33 %)

Error	Example of Error
No topic sentence	—
Incomplete topic sentence	Rubber I would use for making shoe.
Incorrect topic sentence	For making shoes a material we use.

2) Verb Phrase (86.79%)

Error	Correct Structure	Example of Error
--- + V. 3	to be + V. 3	The tennis racquet divided into 2 groups
Detached + no prep.	detached + from	The water pipe which is made of metal is detached the wall.
show + prep.	show + no prep.	Figure 3 shows to the structure
used + prep. to	used + prep. for	which is used to photosynthesis
fix + prep. at to be + consisted of	fix + prep. to consists of	fixed at the wall a baby bicycle is consisted of
to be + include	include	—
consist + no prep.	consist + prep. of	It consists 2 legs.
to be + adj + in shaped	to be + adj + in shape	which is rectangular in shaped
attached + from	attached to	It is attached from the wall

3) Main Verb (71.69%)

Error	Example of Error
Subject and verb agreement	The handle bars is A tennis racquet consist of
No main verb	The spherical flask in which saline is located on the tripod.
Two main verbs	It is contain saline.

In Course 192, we emphasize the Writing elements of; introduction, properties, listing, example, cause-effect, contrast, comparison, less than, more than, conclusion, suitability, ratio, possibility, frequency, prediction, composition, and proportion. Student errors in these areas commonly took the form of subject-verb agreement, active instead of passive voice, wrong form, wrong verb[8].

In Course 291, most student writing errors (62% of them made mistakes) occured in the area of Verb Phrase;

Error	Correct Structure	Example of Error
Agreement	Verb + s	The experiment describe____ the method
Wrong forms	Verb + ing Verb + ed	the diagram shown the experiment it leading to an
Insertion of 'be'	Verb + s Verb + V1	ice age the ice is expanding the reaction is occurred the mixed solution is happen It is to comprises we should be collect residues
Wrong forms after modal	Modal + V1	we should poured
Omission of 'be'	Modal + be + Ved	the solution ____ decanted
Wrong form	be + Ved	the solution is filter____ the solution have
Wrong form after modal	Modal + be + Ved	separated metal can be reclaim____ metal can to reclaim____
Imperative	V1 + NP	First, to add the solution stirring the mixed solution
Causative verbs	cause + NP + to + V1 allow + NP + to + V1 prevent + NP + from Ving make + NP + V get + NP + Ved	it cause silver____ precipitates allow water layer to expand it expand it prevents silver ____moving it makes silver to form get the silver mix____
Omission of 'to'	V1 + to + V2	you want ____ operate
Infinitive	in order to + V1	the machine in order to separating

In Course 292, the percentage of student error were more evenly divided among different areas with Main Verb, Connective, and Topic Sentence the chief probems, closely followed by Verb Phrase and Clauses[9].

Although the type and level of writing differ, a general trend can be discerned. It appears that errors at the phrase level have been reduced by the fourth course (292) and more problems are encountered at the clause and inter–sentence level. But further investigation is needed to determine which errors most impede written communication

The large scope of this Evaluation Project and the great amount of data it provided afforded us the opportunity for speculation in the following areas;

1. Teaching Methods

It is a matter for concern that students perceived lecturing as one of the most frequently used methods, and a number of teachers have noted a need for discussion of teaching techniques. In trying to improve English teaching in a particular situation, it is usually easier to try to improve the materials than to try to improve the teaching and this has been the case with the English for Science Programme. It could be argued that the emphasis on self-instruction materials is a way of avoiding the problem of improving teaching and the majority of teachers feel that there is too much self-instruction in the courses. An attempt was made over one semester to practise micro-teaching using closed circuit television but this was not received with a great deal of enthusiasm, possibly because of the abruptness of introduction or the amount of exposure involved. A number of visits were made to classes but the open discussion of and improvement of teaching techniques is an area which needs to be given much more attention in the future. A further concern of the English teachers was to have more discussion of general science and help with technical vocabulary.

2. Subject Teachers' Use of English

English for preparing classes, reading and translation are ranked by those teachers. These skills are most likely used for the production of lecture handouts in Thai and also for the translation of English textbooks into Thai, a popular way of gaining promotion. Another way of gaining promotion is by the publication of research papers, and for this purpose reading, particulary, and also writing and translation are required.

Over half of the subject teachers feel that they need to improve their English for their work in all the skill areas and the possibility of providing courses for them should be followed up. The preferred area for most teachers appears to be writing.

3. Students' English Language Needs

Many students at the University hope to go on to study abroad and the importance of English for this purpose is realised. Almost all of the English and subject teachers see the necessity for the four skills but they disagree on translation, with a majority of the subject teachers viewing it as important but only one quarter of the English Teachers.

In considering future language needs from a student's point of view, it is likely that they see the crucial ones as those necessary to pass the English examinations to go abroad. Washback effects from these examinations are, therefore,

likely to be large and this needs to be borne in mind by those setting them. The extent to which courses should be geared to such examinations in order to tap student motivation is difficult to assess.

Finally, we concluded the Evaluation Project report with the following recommendations :

1. The Design and Administration of Evaluations

Any further evaluation studies need to pay particular attention at the design stage to :

(1) the scope of the evaluation and the amount of work involved ;

(2) the design and pre-testing of the questionnaires ;

(3) the objectives. validity and inter-relationships of any tests used ;

(4) techniques for coordinating work if more than one person is involved ;

(5) the selection and size of the samples.

Administrative problems which were faced and which need to be anticipated include :

(6) the commitment of project personnel and the time they are prepared to devote ;

(7) the degree of cooperation which can be expected from those selected for those selected for the samples ;

(8) the expertise available should problems arise during the design and analysis stage.

2. The English for Science Programme

The following changes in the Programme and areas of further investigation should be considered :

2.1 Skills

(1) Speed reading should be dropped from Course 291.

(2) Note taking should be maintained but consideration should be given to dropping writing descriptions and reports and, possibly, substituting another area of writing, such as correspondence for them.

(3) The listening sections should include more general content matter with a higher interest value for students.

(4) The Programme should provide, or at least appear to provide, more speaking practice.

(5) The nature and content of lecture handouts given to students by subject teachers should be examined.

(6) More needs to be known about the techniques and language which students use for taking notes.

(7) Ways in which practice in English to Thai translation can be included in the Programme should be considered.

2.2 Specialisation

The content of the materials should be made rather less specific to particular subject fields while still appearing relevant to these fields and maintaining the conceptual framework of the courses with which all concerned seem satisfied.

2.3 Difficulty

The concept of 'difficulty' should be examined in relation to linguistic skill and subject matter aspects of the courses.

2.4 Course Test

(1) The semester tests should be retained because of their feedback value but the final examinations should be abolished.

(2) The marking of test needs greater standardisation by, for example, introducing multiple choice or other techniques which allow objective scoring.

(3) The ralation of the results of course tests to reading ability in subject areas needs to be examined.