Course Design for First Year Students in English for Science and Technology at Chiangmai University

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1. Introduction

As from June 1978, a first year English course for students of science and technology was introduced at Chiangmai University. This complements the existing second year courses, the final aim of which is an ability to read fluently and with comprehension in the subject areas. The goal of the first year course is improvement in basic skills in the area of general scientific discourse with particular emphasis on reading.

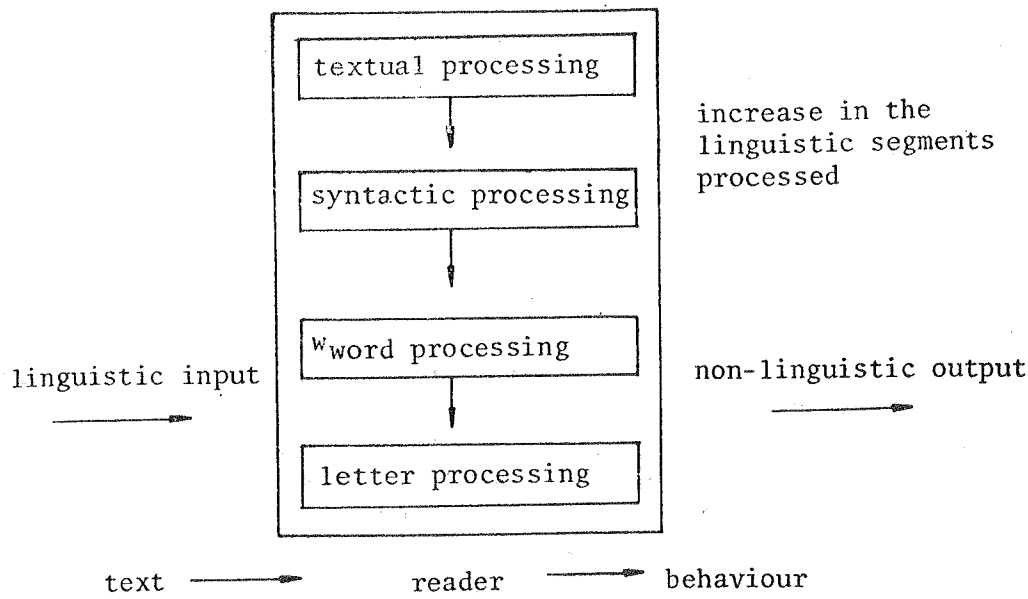
In this paper I should like to take up the emphasis on reading and look first at an approach to the reading process, secondly at ways in which reading skills may be related to certain categories used to describe language and finally at the way in which my colleagues and I are trying to incorporate some of these insights into a course design.

2. The Reading Process

Recent work in psycholinguistics[1] has shed some light on what is involved in L1 reading. At least two factors seem to be important: the reader himself provides most of the information necessary for understanding a text; information is processed in units larger than words and structures. The reader is operating at the level of meaning and it has been suggested that two processes are involved[2]:

(a) parsing : understanding the meaning of a sentence using only the subject noun and main verb – the rest of the sentence is predicted on the basis of this information.

(b) inference : the writer assumes the reader already possesses information–and therefore the reader must infer information missing from the text.



The model illustrated above views the reading process as a hierarchical series of strategies. A fluent reader in L1 is able to concentrate on meaning and process at the textual level while lower level strategies at the syntactic or word level operate automatically. When a difficulty occurs, he may consciously employ syntactic or word strategies to overcome the problem and then switch back to textual processing.

For the reader in L2, however, the strategies do not operate automatically and therefore his attention is diverted to lower-order processes and he is not free for higher-order processes such as following an argument. The implication for the L2 reader is that although the aim should always be reading for meaning, he may benefit from practice in word and syntactic strategies so that they become more and more automatic, leaving him free to process information in larger segments. Clearly, this model oversimplifies but it does put a usefal emphasis on what kinds of behaviour occur in reading and suggest that it is worth looking at what kind of strategies can be associated with different language categories.

3. Categories and Strategies.

3.1 Vocabulary

(a) use of dictionary
(b) internal clues : affixes and stems
(c) external clues : e.g. synonymy, antonymy
(d) word retention : mnemonics
(e) collocation[5] : identifying words which regularly co-occur

Many of the items under this heading will be familiar and although use of dictionary and word retention are not directly related to the reading process, they are clearly important for efficient reading. As well as teaching vocabulary, then, we are trying to provide students with techniques so that they can learn by themselves. The selection of which particular strategies to include in a course will depend upon students' needs and time available.

3.2 Sentence

(a) practising sentence structure[6]
(b) decoding simple and complex sentences[7]
(c) prediction on the basis of syntactic clues[8]

At this level the traditional approach has been to look for the most frequent structures and use these as a means of organising a course. The emphasis was on what meanings are expressed by a particular structure. More recently, it has been pointed out that the structures themselves present problems, that is at the syntactic level of processing, and attention has been given to helping L2 readers to decode simple and complex sentences. Recent work has indicated that L1 readers predict sentence structure on the basis of syntactic clues and teaching such predictive skills would be particularly important where a higher reading speed is aimed at.

3.3 Concept

(a) preparing students to identify concepts as exemplified by certain sentence structures.
(b) The syllabus used by "Nucleus: English for General Science"[9] is as follows:

Discourse Type	Concept	Structure (e.g.)
Description of form	Properties+Shapes	NP+have+Adj+Noun
	Location	Prep. Phrases
	Structure	Verbs associated with Srtucture
Description of measurement		
Description of process		

If we are interested in English for a particular field, let us say science, then it is possible to specify which concepts or areas of meaning are important for that field. Here, the emphasis is on which sentence structures express a particular concept. Thus, it is possible to use concepts as a means of organising a course and the table above indicates how they may be related to broader types of discourse. There are a number of advantages to using a conceptual organisation: it allows a review of sentence structure without emphasising it – repeating a gramma-

tical syllabus may well be boring for university students; concepts cut across different scientific disciplines and therefore it is possible to write an English for General Science course, the emphasis is on looking for meaning.

3.4 Function

(a) preparing students to identify functions as exemplified by certain sentence structures[10]

(b) preparing students to identify discourse position of functions

(c) annotation of functions as a preparation for note-taking

(d) The syllabus used by "Communicate in Writing"[11] is as follows:

Discourse Type	Discourse Position	Function	Structure (e.g.)
Describing things and ideas.	Introduction	Defining Classifying Identifying	X is a Y which.... There are two types of..... The most important one is.....
	Development	Contrasting Exemplifying	
	Conclusion	Summary	
Describing processes			
Argumentation			

Conceptual meaning, however, is only one aspect of a writer's communication. We need also to consider the purposes or functions typical of scientific discourse and which sentence structures express them. Thus, one aim of recent courses has been to help students identify and produce such functions as definition and classification. Functions may be employed to organise a course and the table above indicates how they may be related to broader types of discourse. This would appear to provide an interesting way of relating a conceptual syllabus to a functional syllabus.

The "Communicate" course also relates particutar functions to a certain type of discourse. The implication for course design is that if we sequence the course on this basis, the cumulative effect will be to help the student produce correctly-ordered discourse and, by setting up expectancies, to improve his reading.

3.5 Paragraph

(a) identifying the topic and function of a paragraph and the concepts involved.

(b) identifying grammatical and logical relations between sentences.

(c) scanning for specific information.

(d) skimming for the general idea.

At this level, the traditional approach has been to identify such aspects as topic, main idea and supporting detail. We have not found this appropriate for scientific writing and find an analysis of topic, paragraph function and concept or concepts involved to be more useful and this provides a build-up to the skill generally labelled "skimming". Annotation of the paragraph for functions brings attention to the detail of the paragraph and relates functions at the sentence level to functions at the paragraph level. Other strategies include scanning for specific information and identifying the logical and grammatical relations between sentences.

3.6 Text

(a) paragraph relations: grammatical, logical, rhetorical.
(b) previewing: e.g. clues from author, abstract, sub-headings, diagrams.

At the highest level, we can consider not only the way in which paragraphs relate to each other and to the topic of the text but also techniques for previewing and survey reading.

4. Syllabus design

(a) two-year programme:

Course	Discourse Type	Goal
191	Description of form	Read and write one introductory paragraph
192	Description of measurement	Read and write three paragraphs: introduction, development, conclusion
291	Description of process	,,
292	Argumentation	,,

(b) 191

Discourse Type	:	Description of form
Concept	:	Properties + Shapes Location Structure
Vocabulary Strategies	:	Word meaning by : - use of dictionary - affixes and stems - context
Sentence Strategies	:	Decoding simple sentences
Reading Skills	:	Sentence relations - reference Scanning - identifying specified information in paragraph Skimming - identifying topic, function, detail of a paragraph
Function	:	Identification Definition Classification
Writing Skills	:	Annotation Discourse plan for one paragraph Write one paragraph

We first tried to decide which areas we should cover in which course ((a) above)). The general consensus was to cover fewer points more thoroughly and to give the teacher more time for helping the weaker students.

The second table outlines the first semester reading-writing component. The structural content is specified by the concepts and functions selected. It was decided to complete coverage of vocabulary strategies in the 191 course, to deal only with simple sentences and to restrict sentence relations to reference items. This led us on to a more detailed specification of the syllabus in which we employed two main guidelines : to relate skills to concept and function wherever possible ; to allow for as much review as possible.

The specification is provisional and will be modified as materials are written and as they are tried out in the classroom. In this way, we hope to develop a course which goes some way towards helping students read their science text books, and to write reports on scientific topics.

References

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[2] "The Role of the First Language in Second Language Reading Comprehension" Ulijn J. and Kempen G., paper read at the 4th AILA Congress, Stuttgart, August 1975.

[3] "An Integrated Model for First and Second Language Acquisition", Ulijn J., SYSTEM Vol 5 No 3. Oct 1977, 187-199

[4] "How to Remember Anything", Markoff D. et al, Arco Publising Company, 1976.

[5] "Advanced Vocabulary Teaching : The Problem of Collocation", Brown D., RELC Journal 1974/5: 2, 1-11.

[6] See, for example: "A Course in Basic Scientific English", Ewer J. and Latorre G., Longman 1969.

[7] This forms an important element of the Asian Institute of Technology reading programme.

[8] "Reading, Perceptual Strategies and Contrastive Analysis", Cowan J., Language Learning Vol. 26 No. 1, 95-107
"Sentence-Level Expectancy as an Aid to Advanced Reading", Pierce M. TESOL Quarterly, 73 7/3, 269-77

[9] "Nucleus: English for General Science", Bates M. and Dudley-Evans A., Longman 1976.

[10] See, for example, "English in Focus: Physical Science" Allen J. and Widdowson H., O.U.P. 1974

[11] "Communicate in Writing", Johnson K., Centre for Applied Language Studies, University of Reading 1976.