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ABSTRACT

In July and August of 1980, material writers at the University of California-Los Angeles designed a course that would focus on the various reading and writing skills that science scholars would need for successful graduate study in the United States. The scholars were advanced learners of English from various science fields, and the course was to be taught in the People's Republic of China. Integration of reading and writing was accomplished through the careful selection of a series of articles from professional journals treating several topics so that the result was a number of articles per topic. Reading exercises were then written for these articles and for essay on the philosophy of science. Some of the skills treated included skimming, vocabulary through context, reading for the main idea and supporting details, and summary through paraphrasing. In addition, the course emphasized the rhetorical functions most common to scientific writing, such as process and physical description, classification, definition, cause-and-effect, listing, and comparison. Treatment of the rhetorical functions involved both recognition in the reading and production in the required writing. Finally, the topics about which the students wrote necessitated the synthesis of the articles read or demonstration of application pertinent to the student's own field. (Author/AMH)

An Advanced Reading and Writing Course for Science Students

Celeste M. Scholz

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Randy Stice, Jim Griswald and Kristen Linden-Martin as well as the author were involved in the original writing of these course materials during the summer of 1980 at the University of California-Los Angeles before going to China. Ann Hilferty, Nancy Marwin, Chen Yong Pei and Weng Xian Xiong were involved in teaching the materials in the Guangzhou English Language Center in Canton and subsequently the revising and rewriting that was a product of student/teacher evaluation.

Background

Before examining the actual materials, it is imperative to know for whom they were written and why they were developed in the first place.

In 1979 it was first agreed that UCLA would initially set up two language centers in China--one in Peking and one in Canton (Guangzhou). These two centers as they exist today prepare science scholars from all parts of China in English so that they can pursue advanced studies in the US. These scholars are in the fields of Physics, Chemistry, Biology and Engineering, for the most part, and destined to be graduate students or visiting scholars in the university. Visiting scholars are visiting professors who engage in research of their own and are not studying towards any academic degree.

The program itself is designed to be an intensive one,

comprised of three levels--A, B, and C--each lasting 10 weeks for a total of 30 weeks. The majority of class time is spent on the skills of speaking, listening, reading and writing with additional hours in a course about American Culture and the Learning Resource Center using self-study materials. The English level of the students can be described as intermediate to advanced as they enter the program with an estimated TOEFL of 460 and exit at approxiamtely 550.

Reading/Writing Skills--Levels A and B

An evaluation of possible textbooks was carried out and published textbooks were selected for Levels A and B. Of course, some of the more obvious criteria of selection were materials that would interest students of various science areas and those written at an intermediate level. Since the books were to be used in an EFL environment, care was taken to avoid materials that were too culture-bound (ESL) to be effectively taught by both American and Chinese teachers in China. Finally textbooks were chosen that seemed appropriate for this targeted group of students, although no one could be certain because this was the first time students of this type were brought together to be trained in China for this purpose.

Insert Table 1 about here

This selection should NOT be considered as the only possible choice of textbooks for the two levels, as there are other books that may be of equal effectiveness. In fact, there was some

Table 1

UCLA China Exchange Program

	READING	WRITING
Level A (460-490)		
Book:	Read and Note (Purvis, Heineman)	English in Physical Science (Allen, Oxford)
Context:	Short adapted texts from science journals	Adapted texts of science topics
Tasks:	Practice of 5 note-taking methods	Grammar exercises with science subjects
	Reading comprehension questions	Controlled writing exercises with science subjects including discourse (def., class., description)
		Vocab. and referential reading exercises
Level B (490-520)		
Book:	Reading for Academic Purposes (Long, et. al, Newbury House)	Writing for a Specific Purpose (McKay, Prentice Hall)
Context:	Adapted texts of academic topics	ESL information to ellicit functions
Tasks:	Reading skills exercises (skim, scan)	Intro. of single functions through phrase lists
	Reading comprehension questions	Relatively uncontrolled writing in ESL/ academic situations of single function (clarify, recommend, etc.)
	Vocabulary exercises (guessing, stems)	ESL grammar exercises
	Grammar exercises	Error correction
Level C (520-550)		
Book:	UCLA China Exchange Program Materials (Scholz, Stice, Griswald, Linden-Martin)	
Context:	Unadapted texts from science journals and reading on philosophy of science	
Tasks:	Reading skills exercises and note-taking	Uncontrolled writing of a combination of rhetorical functions
	Reading comprehension questions	Uncontrolled writing of science topics to synthesize information of several journal article on same subject
	Identifying of rhetorical functions	Writing of research paper
	Vocabulary exercises	Peer and self-correction of errors
		Grammar exercises to focus on group errors

revision in the textbooks used in Reading at A and B, based on student/teacher evaluation during the first five sessions.

Reading/Writing Level C

When a textbook was considered for Level C Reading and Writing, it was deemed impossible at that time to find a textbook that combined the varied interests of science scholars in the EFL context and the challenge of advanced material. A closer look at the contexts of the A and B reading/writing books also revealed a need for exposure to unadapted material (that is, material not rewritten by an English teacher) to be used as actual reading material and models for writing. Also, a need was obviated to focus on the writing of a combination of rhetorical functions on topics that forced students to synthesize information read in a variety of resources--a simulation of the writing situation often found in graduate school--that is, first, researching and then combining read ideas with one's own. It was these types of tasks that were incorporated at Level C. Recently ESP literature has urged administrators and practitioners to avoid a duplication of materials or 'a reinvention of the wheel'. (Swales and Ewer- and Boyd: 1980, 1981) However, a textbook could not be found at that time to incorporate these needs. Perhaps the same would not be true today with many recent publications.

Insert Table 2 about here

Table 2 gives a detailed outline of the Level C Reading and Writing course.

Table 2

Outline of Level C Reading and Writing

Week	Reading	Writing
1-3	Skills and functions Articles: Robots 1 Robots 2 Phil. of Science 1 Robots 3 Fish Culture 1 Phil. of Science 2	Review of paragraph construction Analysis of combinations of rhetorical functions in short journal articles Writing of compositions based on combinations of functions with field-related topics
4	Skills and functions Articles: Fish Culture 2 Fish Culture 3	In-class and at-home essays on robots Peer and self-correction Grammar review
5	Skills and functions Articles: Lasers 1-7 Phil. of Science 3	In-class and at-home essays on fish culture Peer and self-correction Grammar review
6	Skills and functions Articles: "Petrol Planatations... Phil. of Science 4	In-class and at-home essays on lasers Peer and self-correction Grammar review
7-9	Skills and functions Articles: "Earthquake... Phil of Science 5 "Tree Corps" Phil of Science 6 "Future of Science" Phil of Science 7	Intro and writing of research paper Empirical/Descriptive Format Use of charts, graphs Peer and self-correction of sections of research paper Academic memos/notes written for situations

Skills: Skimming, identifying main ideas, guessing vocabulary through context, understanding inferences, paraphrasing, summarizing, scanning.

Functions: Physical description, process description, definition, classification, listing, exemplification, causative, contrastive.

Article sources: McGraw-Hill Encyclopedia of Science and Technology, New York, Mc-Graw-Hill Yearbook of Science and Technology, New York, New Scientist, London, Science, American Assn. for the Advancement of Science, Washington, D.C., BioScience, Science News, Environment, Oceans, Physics Today, Laser Focus and there are many others.

Materials Development Issues

In a discussion of these materials and in observing their being taught for the past year and a half, several basic issues should be examined.

Physical condition/Text security. Swales (1980) mentions that one of the "potential virtues" of published materials is "that they have a clearly discernible shape: a beginning, a middle and an end." He talks about problems with "showers" of single-paged hand-outs. In order to eliminate these types of problems the materials were reproduced and bound to create in the students a sense of text security. Of course, this also meant creating a semi-permanent form before the materials were actually tested--a disadvantage. As it has worked out, since the materials have been used and reused for a little over a year, they are becoming dog-eared just as teachers have begun talking formally about revisions in re-ordering and adding materials.

"The teacher/materials equations" (Strevens, 1977). Strevens (1977) contends that "the higher the general standard of the teachers, the less important are the course-books and other teaching materials." It was found at the program in Canton that there was a need for editing and clarifying exercises once the materials were classroom-tested by trained ESL instructors. Comments were entered in the teachers book for future reference. With the incorporation of Chinese English teachers in the course, who had for the most part, little or no training in language teaching, other needs became apparent. A key was written to the reading exercises with explanations why the answers were correct.

Teacher discussions took place which outlined methodological rationale for the use of journal articles with a length of 2 to 5 pages. Since reading in China is largely taught by the 'explication de texte' method (i.e. detailed analyses of vocabulary and grammar) a skills approach to reading practice as is used in the reading materials was a new teaching method. This particularly affected the pacing of the class, as a 2 to 5 page article would be sufficient material for a week or two using the explication de texte method. Originally the materials were designed to be most conventiently taught by the same teacher. However, because of scheduling constraints this became impossible. It then became necessary for a writing teacher who had never taught the reading course to read the articles which were used as the basis for writing topics. It must be remembered that in writing material of this nature, "in many ESL learning/teaching settings around the world the written texts and recorded tapes exert a powerful and unquestioned force...the textbook may well be responsible for teaching the teacher as well as the student." (Morley, 1979)

Student Evaluation. Through the exposure to unadapted journal articles, students became anxious to read about articles that related more directly to their own specialization. As a result, a 2-hour class period was given once a week during weeks 7, 8 and 9 so that students could bring an article to class to read and summarize. This was done during class time to give a specific time limit to force students to use skills that increased speed. The Learning Resource Center contains about 10 years of Scientific

American, so many students found articles there.

In the writing of essays based on the synthesis of articles, students had to be encouraged by the teacher to try their best. While most students succeeded in this with practice, they seemed reluctant at first since organizing and commenting in writing on material which they had read in English was new to them. It also gave the teacher an opportunity to indicate to the students when quotations and footnotes were necessary and when they weren't. This is something which couldn't be done as easily if the student were writing about his own field, because the teacher wouldn't actually know what was quoted or not.

It was also found at the Language Center in Canton that if a student was asked to write about something related to his own field in an effort to address each student's needs his writing would be remarkably better--especially in grammar. While it's probably true that learner would write better about something he is very familiar with, it was found that learners would frequently write about the exact same topic (occasionally with a few changes) any time he was asked to write about his own field. The result was large chunks of memorized writing with little challenge to the writer's further development.

Practical considerations. From a practical aspect, the task of writing a research paper has been re-evaluated. It was found in Canton that university library resources were not made available to temporary students and even if they were there were gaps in certain specialist areas. Students who were to be future graduate students had little experience in empirical research (test, results and conclusion).

In an effort to alleviate these difficulties students were then encouraged to write papers of a more explanatory nature, but still focusing on an aspect of their own field or speciality.

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