

PACKAGING EDUCATIONAL MATERIALS : TOWARDS A SOLUTION TO SOME EGYPTIAN EDUCATIONAL PROBLEMS : A Report on pilot Packaged English Course Taught Via Cassette Tape	العنوان:
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PACKAGING EDUCATIONAL MATERIALS:
TOWARDS A SOLUTION TO SOME EGYPTIAN EDUCATIONAL PROBLEMS
(A Report on a Pilot Packaged English Course Taught Via Cassette Tape)
Norman Gary and Judith O. Gary

1. Introduction

It has become a cliché to list the problems facing Egyptian public education at all levels: primary, secondary and tertiary. Every educator working in the Egyptian system has his own list, and in general the lists will all show remarkable agreement about what the problems are: classrooms are often over-crowded; teachers are often called on to teach subject matter they don't feel qualified to teach; many of the educational facilities are over-taxed; because of the crowding, sometimes students move from one level to another without being adequately prepared, sometimes there is a discrepancy between nationally stated objectives for particular subject matters and the actual performance tested in the national examinations; teachers feel they are underpaid and resort to outside jobs to bring themselves an adequate income; etc.

Some of these problems--such as teachers' salary scales and the national examination system--are beyond the scope of any specific educational proposal--these are problems which must be dealt with nationally and reflect national realities and policies. However, some of the problems are at least amenable to educational solutions--that is, a change in educational methodology or materials might produce a clear and substantial improvement in the educational output of the system.

This paper will address itself to ways of solving some of these problems--and solving them within the realistic constraints of the Egyptian educational context.

The Dean of the Faculty of Education of Ain Shams University is fond of telling his colleagues that it is easy to make suggestions which could improve education in Egypt: have better facilities; have smaller class sizes; have up-to-date audio-visual aids; have better prepared teachers--all of these would produce positive results. However, the Dean goes on to remind us, what is needed are plans and programs which will produce improvements NOW, given the existing conditions, because we all recognize that for many historical, political, and economic reasons, we cannot expect overnight, short-term, substantial changes in the conditions which cause many of the problems facing Egyptian education.

This paper is an attempt to illustrate how a concerted effort on the part of concerned educators can produce substantial changes in educational output within the limitations of the Egyptian situation. Specifically, we will describe a pilot program undertaken at the Faculty of Education in teaching English to science education undergraduates. This pilot program was designed to teach English to science education students in large classes with materials which could be used by relatively untrained, non-fluent teachers, by using a limited technology--namely a cassette tape player--combined with carefully structured student materials and a highly explicit teacher's manual. In effect the program provided a complete package of materials which could be used by any teacher who could read English and who was committed to teaching the subject as well as possible.

While this particular program is concerned with teaching English, we are convinced that a similar technique could be used in a wide variety of educational programs and subject matters: other foreign languages, Arabic literature, mathematics, sciences, history, health, etc. Such a program would allow the most highly trained teachers to prepare materials which could be widely disseminated and used by much less qualified teachers--in essence providing the best, most qualified and creative teachers the widest possible student audience and to do so within the on-going educational structure and with the addition of only a minimal technical innovation.

The program described here is not easy to prepare; it requires much hard work and some field testing. But it is clearly possible given the educational commitment of a few key people, and it is of proven effectiveness in teaching the specific program described here.

What follows immediately in this paper is a fairly detailed description of an English program developed at the Faculty of Education as a project of the Center for Developing English Language Teaching (CDELTA). We have gone into considerable depth in describing the program in order to make clear what some of the considerations may be in developing such a program. Different subject matters would of course require different actual content techniques. However, the actual formatting described should work with almost any subject matter. The overall rationale for the package of materials--providing a tightly controlled presentation of the content through the cassette tape, including very explicit instructions to the classroom teacher as the lesson proceeds, and providing for constant student performance and feedback to the student concerning his performance--these things should prove relatively constant no matter what the subject matter is that is being taught.

The next part of this paper will be a detailed presentation of the experiment which was conducted to test the packaged materials against the ongoing instructional program. After this description, we will suggest some procedures which we have found helpful and necessary in developing such materials and suggest how other package programs might be developed for other subject matter fields.

2. Background to the Pilot English Curriculum Development Program

Students leaving pre-university schools to enter the university in Egypt often come with inadequate preparation in English, the major language of modern world commerce and technology. This poses a considerable problem at the university level in courses where English is either one of the media of instruction or where a considerable portion of the required academic material is available only in English. Thus students in such courses urgently need the skills of understanding spoken and written English. Even in those courses where English does not play such a directly important role, English is considered important, reflecting the faculties' concerns that their students have access to the commercial and technical literature that is available in English. Consequently, the faculties where English is considered of great importance find that they are teaching English as well as teaching the specialized materials of the fields in the faculty. This phenomenon has given rise to recognition of the need for something often referred to as English for Special Purposes (ESP), that is, the study of English primarily in order to acquire it as a tool for learning something else.

In Egypt there is a need for English teaching materials which take into consideration the following: (a) learners with initial low levels of preparation in English, (b) relatively large classes, (c) relatively un-trained teachers.

This experimental project is an attempt to demonstrate that English can be taught effectively in the face of these problems by appropriately combining a sound methodology with a limited technology, namely lessons teaching scientifically oriented content taught via a cassette tape player used in conjunction with a classroom teacher and a set of accompanying written materials.

Specifically the pilot study of 1977-1978 consisted of the development of a set of instructional materials taught via a cassette tape recorder under the control of 3 different classroom teachers, taught to 8 sections of first year Natural Science Education students at the Faculty of Education and compared on a Pre-test/Post-test measure of English Proficiency with 6 sections of Mathematics Education students who were instructed via a reading and grammar oriented scientific English course, taught by 4 teachers.

3. A Description of the Control and Experimental Programs

3.1. The Control Program--The On-going English Classes for Science Students

Science Education students at the Faculty of Education are divided into three basic groups: Natural Science (Botany, Zoology, and Geology), Physical Sciences (Physics and Chemistry) and Mathematics. These students enter the Faculty usually having completed 6 years of pre-University English courses.

All science education students are required to take one hour per week of English for the first 2 years. The instructional year at the Faculty is typically 20-25 instructional weeks. However, for a variety of reasons, the first year students usually have a much shorter instructional year. In 1977-78, it was approximately 15 weeks.

In 1977-1978 the Department of English used the textbook, A Course in Basic Scientific English, by J.R. Ewer and G. Latorre (Longman, 1969). The book was used for both the first and second year courses. The syllabus called for 6 of the units to be completed for the year. Each unit consists of a reading passage of a scientific nature 300 to 700 words long, followed by reading comprehension questions over the passage and then a series of exercises on vocabulary, grammatical structures, and Discussion and Criticism questions.

The typical teaching procedure entailed the teacher assigning the passage to be read at home, and sometimes for the exercises to be prepared ahead of time. When the students came to class, the teacher would read the passage through aloud with the class, answering students' questions about the meaning. Then various of the exercises would be discussed from those provided at the end of the Unit's text. It usually took 2-4 weeks to cover one unit. This then was essentially the procedure followed in the classes forming the control group.

3.2. The Experimental Program--Cassette-Centered Instruction

3.2.1. Rationale for the Experimental Materials

The materials tested during the 1977-1978 pilot project were designed to emphasize the decoding language skills of reading and listening. It so happens that these are skills most people need most urgently, i.e., the ability to understand written material in English and to comprehend spoken English.

Theoretically, if students only need to read English, they are not required to also learn to comprehend it aurally, through listening. However, the aural component in this ESP program is considered very important and is included for three reasons, one practical, one theoretical, and one pedagogical.

In practical terms, it appears to be true that many, if not most, Egyptian students do need to understand spoken English.

From a theoretical point-of-view, the use of the aural and visual modes in developing language comprehension should re-inforce one another; that is, one can learn to read more easily by having the accompanying aural input, and one can learn to understand aural input better by having access to the more permanent, temporal free written form. This reinforcement and transfer of skills is of course an empirical issue in its own right, and one which we hope to be able to explore in further research with the materials.

From a pedagogical standpoint, the use of the aural mode in the instructional program, via the use of the cassette tape, allows the materials to be structured, presented, paced and evaluated in a highly controlled way. If the program were solely reading-based, the curriculum itself would be much more subject to variation from class to class, and teacher to teacher.

3.2.2 Description of Materials

The ESP materials developed in the pilot program provide a complete package of materials. This package consists of:

- a) A cassette tape for each lesson (a lesson being defined as an instructional period of approximately 45-50 minutes). This tape instructs both teacher and students in what to do during the lesson. In early lessons, the teacher is called on to illustrate at the chalkboard appropriate responses to cues and questions provided by the tape. The students are called on to respond in their workbooks (actually simply duplicated exercise worksheets) after watching the teacher. And the teacher is then called on to illustrate the appropriate response after the students have tried to respond; this way the students can check their responses against the response of the teacher.

b) A set of written materials for each lesson. These materials are basically of three types:

- 1) preparatory materials--materials which give the students work to do before the actual class meeting in preparation for the class. These preparatory materials take different forms with different lesson types. In early lessons it is reading review of grammatical structures to be used, such as answering simple questions about visual material. In later lessons it is vocabulary work and preparatory reading.
- 11) in-class worksheet materials--materials in which students respond during the class in following the tape-recorded lesson. In early lessons these work-sheets provide simple ways for the students to respond to commands and questions. In later lessons the worksheets provide several different kinds of tasks for the student to perform, including:
 - (1) providing him with different ways of answering questions posed by the taped lesson (e.g., multiple choice answers to choose from, incomplete sentence responses to be completed appropriately, etc.)
 - (2) providing him with written versions of passages he has already heard aurally, but with blanks in the passage for him to complete--thus requiring him to integrate his reading comprehension ability with his aural comprehension, and
 - (3) short written responses.
- 111) follow-up materials--materials which give the students work to do outside of the class which complement the material just presented in the class. These are combined with the preparatory work to be used in the next class.

c) A Teacher's Manual-- This manual explains the lesson objectives, gives any special instructions, and provides the teacher with a complete tapescript of the lesson on the cassette tape.

4.0. Results of Proficiency and Student Affect Measurements

4.1. Proficiency Pre-test/Post-test Comparisons

Both experimental and control groups were pre-tested and post-tested using a proficiency test with four sub-tests. These sub-tests were drawn from a longer proficiency measure being developed by the Center for Developing English Language Teaching at the Faculty of Education.

The four sub-tests were:

- a) Grammar--This consisted of 15 items concerning grammatical usage. A sentence was given with a blank in it and 4 multiple choice items were given for the students to choose from. The items used ranged from choice of appropriate tense forms to appropriate pronoun case forms.

- b) Listening Recall--This consisted of a written passage of about 90 words, telling a very simple narrative story. 15 of the words were left out and blanks were left for the words. The words which were left out were content words and could not be easily retrieved from the story itself, although an understanding of the story would narrow the possible choices down. The students were instructed to read the passage silently. Then they were read the passage aloud two times, and told to fill in as many blanks as they could.
- c) Listening Multiple Choice--This consisted of sentences which the students heard 2 times each and then chose an appropriate multiple choice answer or response to the cue sentence.
- d) Reading Comprehension--This consisted of three short passages for the students to read and then five questions on each passage for them to reply to. The questions were multiple choice.

Dr. Grant Henning of our Center staff analyzed the longer Proficiency measure sub-tests for reliability using the results from English teaching majors and found that of the four sub-tests we used that the Listening Recall measure had a very high reliability, the grammar next highest reliability and the Listening Multiple Choice and Reading Comprehension sub-tests had relatively low reliability. There's no reason to think this would differ markedly for our population.

The results of the pre-post tests are displayed in Table 1.

Mean Gain from Pre-test to Post-tests, Comparing Only Those Subjects Who were Tested in Both Pre-test and Post-test

Test:	(N: Experimental = 121; Control 48)		Pre-test	Post-test	Mean Gain	s.d.	t.	Signif.
	Group	Mean						
Listening Recall (LR) Total=15	Exp	4.48	6.31	1.83	2.73	6.78	.0005	
	Cont	5.76	4.08	-1.58	3.44			
Listening Multiple Choice (IMC) Total = 10	Exp	2.68	2.70	.02	2.08	1.25	ns	
	Cont	3.31	2.90	-.42	2.01			
Reading Comprehension (RC) Total = 15	Exp	2.96	4.30	1.33	2.38	1.22	ns	
	Cont	3.19	3.98	.79	3.07			
Grammar (GR) Total = 15	Exp	4.32	5.34	1.07	2.51	-.32*	ns	
	Cont	3.94	5.15	1.21	2.74			
TOTAL of all Sub-tests Total = 55	Exp	14.46	18.79	4.26	5.06	4.52	.0005	
	Cont	16.10	16.10	.04	6.39			

* (-) value indicates in favor of Control Group

TABLE 1

The small numbers for N for both groups reflects testing circumstances beyond our control, especially a high attrition rate in the post-test of the control group.

Table 1 shows the Experimental group exceeding the Control group in all sub-tests and Total, except for the Grammar sub-test, where the Control group exceeds the Experimental group. The figures were statistically significant for the Listening Recall sub-test and the Total, where the Experimental group shows mean gains greater than the Control group at a very high level of confidence. It is worth pointing out that the Experimental group received no instruction in grammatical usage--the only sub-test in which the Control group surpassed the Experimental group.

There are several things worth commenting on in these figures. First of all, with the exception of the Grammar sub-test, the Control group showed higher initial mean scores on the Pre-test than the Experimental group. Thus, according to this data, the Control group showed an initial higher achievement level than the Experimental group, which the Experimental group overcame in the 12 instructional hours to the point of exceeding the Control group on all sub-tests except Grammar.

4.2. Student Affect

Students were asked to rate their respective courses with respect to how useful and how interesting they thought they were. Table 2 displays the students' ratings on a 1-5 scale, with 1 low and 5 high. The Table displays the ratings of the experimental group's comparable expository lessons (units 2 and 3) as against the control group's lessons, which were all expository.

<u>Student Evaluation of English Instructional Materials</u>				
(N: Experimental = 144; Control = 86)				
	Means	s. d.	t	signif.
Exp. Unit 2 (Ecology)--Useful?	4.41	(.91)	5.83	.0005
Control Reading--Useful?	3.65	(1.03)		
Exp. Unit 2--Interesting?	4.13	(1.10)	3.23	.005
Control Reading-- Interesting?	3.74	(1.19)		
Exp. Unit ³ (The Cell)--Useful?	4.41	(.97)	5.61	.0005
Control Reading--Useful?	3.65	(1.03)		
Exp. Unit 3--Interesting?	4.10	(.99)	3.24	.005
Control Reading--Interesting?	3.74	(1.19)		

TABLE 2

In this comparison, it is clear that the Experimental group gave a much higher evaluation of comparable materials than the Control group did. The differences are sharp and statistically significant at very high levels of confidence.

The student affect questionnaires asked two questions of both groups trying to get their attitudes towards the study of English and indirectly at their attitudes toward their respective programs of instruction. These questions are given in Table 3, with the respective percentages of students choosing a given answer.

		Exp.	Cont.
A. Should science students at the Faculty of Education be required to study English?			
	Yes:	74.8%	67.1%
	No :	25.2%	32.9%
B. What is your opinion about the study of English at the Faculty?			
a)	strong positive (Wish we'd had more)	17.4%	7.2%
b)	medium positive (Liked it; glad we studied it)	36.2%	20.5%
		53.6%	27.7%
c)	medium (Like it, but need time for other courses)	43.5%	65.1%
d)	medium negative (We don't need it)	2.2%	1.2%
e)	strong negative (Don't like it; don't need it)	.7%	6.0%
		2.9%	7.2%

TABLE 3

Both of these questions also reveal that the students in the Experimental program had a more positive attitude than those in the Control group. This is indicated in question A by some 7 percentage points higher Yes responses to the question. It is indicated in question B by the combined positive total of 53.6% for the Experimental group versus 27.7% for the Control group, as well as the higher percentages on both of the individual positive response items (a) and (b).

5. Conclusion to the Pilot Study

The results of this pilot study reveal that the strongest form of the objectives were attained, viz., students using the experimental materials showed statistically significant greater gains in language proficiency as measured by an independent language proficiency test than students not using the materials; both groups received approximately the same amount of instruction in English. Furthermore, the students using the experimental materials showed a much higher positive attitude toward their instructional program than students in the non-experimental group.

The conclusion to be drawn from this is that it is both possible and desirable to teach English in a classroom setting where there are large numbers of relatively un-prepared students by means of the methodology and materials described herein--that is, lesson materials taught via a cassette tape recorder combined with accompanying written student materials, supervised by a regular teacher. The fact that it is possible means that potentially, carefully structured curriculum using native or near-native voices on the tapes could be taught effectively by relatively non-fluent teachers.

On the basis of the findings during the Pilot year of the Experiment, The Faculty of Education has extended the use of the packaged Experimental Materials to use in two years of the undergraduate science curriculum; this expansion means that approximately 48 sections of first and second year English are being instructed with some version of the Experimental materials described herein, although in a revised version which is being further developed by a curriculum development team consisting of 2 faculty members and 7 demonstrators. A number of research questions are currently being pursued, including materials which will form the substance for at least 2 MA theses. At the end of the current year (1978-79), there will be a core curriculum of these completely tested and packaged ESP materials available and being used at the Faculty of Education. Further research concerning the materials will be forthcoming shortly.

6. ^{the} Relevance to Larger Educational Situation in Egypt

The materials described in some detail above concern the teaching of English and of course many of the particulars are specific to the teaching of English as a foreign language. However, it is the authors' conviction that a methodology similar to the one employed here for language teaching might have an equal if not greater impact in the teaching of other subject matter.

In recent years, a type of instruction commonly referred to as audio-tutorial, has been used increasingly in many educational situations and with a wide variety of subject matters, ranging from mathematics to chemistry laboratory. This type of instruction is designed to be used individually by students working on their own with a tape player. Typically, courses taught via the audio-tutorial approach consist of a programmed workbook text and an accompanying cassette tape which instructs the individual student by telling him what to do, giving him information, explanations, etc., providing tasks for him to perform in practice and then periodically testing his mastery of the material taught. There is nothing very radical pedagogically in this; it simply combines sound pedagogy with appropriate media in order to provide individualized instruction. For a variety of reasons--many economic, some educational--wide use of this type of instruction is probably not feasible in Egypt at the present time.

The English language program described earlier in this paper is essentially an adaptation and development of the audio-tutorial type program to the large group instructional situation. Our experience with language teaching indicates that this type of adaptation can be used effectively. There should be no reason why such an instructional approach could not be used with other types of subject matter: Arabic language, mathematics, science, hygiene, etc. It might be used as the total instructional program--as in the case of the English program described here--or it could be used as a supplement to a course which also used other methodological approaches.

Large group instruction using a cassette-based program would entail taped lessons being played by a cassette player large enough to provide clear sound dispersal to an average class. We have used such instruction with portable, battery-powered cassette players of 2 to 4 watt output in classes of up to 50 students. The maximum size of classes would be determined by the acoustics of the classroom and the output of the tape equipment used. Ideally the acoustics of a classroom should be as good as possible to provide clear reproduction and understanding.

What would be the advantages of such an approach? First, properly designed, a course centered around cassette-taught lessons would provide carefully structured and paced lessons with an appropriate mixture of audio instruction and student tasks to be carried out in the accompanying workbook texts. This would be of special importance in situations where the teacher may not be as well-qualified as might be desired. Second, such instruction would allow for expertise and explanations which even the best qualified teacher might be hard-pressed to do himself consistently. And finally, cassette-based instruction could provide the means for both review and remediation. If a student missed a lesson or experienced difficulty, it would be possible for him to repeat the lesson outside of class time.

What then would be the role of the classroom teacher in such a program? First of all it would provide him with an educational resource that he could use just as he now uses a book. Such a program could be used either totally or supplementarily, depending on the situation. Additionally, it would free the teacher from some of the more mindless aspects of teaching, such as lecturing on factual material which he must repeat year after year, and allow him time both in class and outside of class to work individually with students.

What objections could be raised to this type of instruction? The first one that probably comes to mind is the problem of providing and maintaining the tape players. While this may be a problem to some degree, reasonable planning for an adequate number of players to allow for back-up machines in case of a breakdown, and adequate budgeting to provide for regular maintenance and repair, can overcome the problem. At the Faculty we have taught over 1000 students using only 2 portable tape players. One of the recorders has been used for 2 years with no major technical difficulties.

Another objection which might be raised is that students wouldn't like to be taught by a machine. Again our experience at the Faculty of Education suggests that this does not have to be the case. If the materials are well-written and planned, and the students feel that they are making progress, they seem to respond positively to such instruction. For example, at the end of instruction of our Pilot Year program, we asked the students who participated in the program the following question: "Would you recommend this special course taught using a tape recorder to a first year student next year?" 64% of the students responded positively. We thought this a phenomenal figure, because our recorder during this year was not really powerful enough and the acoustics of the classrooms was quite poor. And this was a course taught in a foreign language--English! There seems every likelihood that a course taught in the students' native tongue would be at least as positively received, if not more so.

To conclude, we are not suggesting that cassette-based instruction might be a panacea for every educational situation. It clearly is not. Furthermore, the development of such instruction requires much time and very careful planning and field-testing. However, we do think, given our experience with this type of instruction, that it offers some very attractive possibilities for educators trying to cope with a multitude of educational problems. It is certainly deserving of further research.

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