

BIBLIOGRAPHIC DATA SHEET1. CONTROL NUMBER
PN-AAH-7562. SUBJECT CLASSIFICATION (695)
JF30-0000-G240

3. TITLE AND SUBTITLE (240)

Establishing an effective model for a Tunisian Lycee Pilote emphasizing English and the sciences

4. PERSONAL AUTHORS (100)

Holdzkom, David; Norris, Myrna

5. CORPORATE AUTHORS (101)

Acad. for Educational Development

6. DOCUMENT DATE (110)

1979

7. NUMBER OF PAGES (120)

31p.

8. ARC NUMBER (170)

TS373.611.H728

9. REFERENCE ORGANIZATION (130)

AED

10. SUPPLEMENTARY NOTES (500)

11. ABSTRACT (950)

12. DESCRIPTORS (920)

Tunisia
Education, Secondary
Education for development
Science education
Language training
English language

13. PROJECT NUMBER (150)

14. CONTRACT NO.(140)

AID/SOD/PDC-C-0191

15. CONTRACT TYPE (140)

16. TYPE OF DOCUMENT (160)

TS
373.611
H128



Academy for Educational Development, Inc.

ESTABLISHING AN EFFECTIVE MODEL FOR
A TUNISIAN LYCEE PILOTE
EMPHASIZING ENGLISH AND THE SCIENCES

David Holdzkom

Myrna Norris

September/October 1979

This report was produced under IQC No. AID/SOD/PDC-C-0191,
Work Order No. 12, between NE/TECH/HRST, Agency for International
Development, and the Academy for Educational Development.

CONTENTS

1. Introduction 1
2. Tunisian Education Today 2
 - 2.1 Tunisian Education Attempts to Minimize the Effect of Individual Differences Among Students 2
 - 2.2 Tunisian Students Focus their Attention on the Baccalauréat 3
 - 2.3 Tunisian Students Study Many Critical Subjects in a Second Language 3
 - 2.4 Independent Study is not Encouraged Among Tunisian Students 4
 - 2.5 Promotion from Year to Year Depends Upon Academic Averages 4
 - 2.6 Preparation for Tunisian Students Who Wish to Study in the U.S. Must In 4
3. Alternative Models for the Lycée Pilote 5
 - 3.1 Intensive Language Study/Regular University Program 5
 - 3.2 Plan as Conceived by the Commission 7
 - 3.3 "Mirror Image" Proposal 14
 - 3.4 Tracking Options 15
 - 3.5 A New Curricular Model 16
4. Factors to be Considered 18
 - 4.1 Linguistic Principles 18
 - 4.2 Pedagogical Principles 20
 - 4.3 Physical Plant 22
 - 4.4 Teacher Training 24
 - 4.5 Evaluation 25
5. Conclusion 25

Appendices

Report of the Commission	
Table 1	i
Table 2	ii
Table 3	iii

1. Introduction

It is increasingly clear that in order to stay abreast of developments in the areas of science and technology a knowledge of English is essential. Many technological areas, of which computer service and aeronautics are just two, conduct virtually all communication and research in English. In most other scientific disciplines, a lack of English proves to be a hindrance for the theoretical or applied scientist.

In order to increase the effectiveness of Tunisia's scientific community, the Ministry of Education has provided a number of scholarships to enable Tunisian students to study in the United States. However, because English, as a school subject, is given a relatively small degree of attention, these students must usually spend several months acquiring the language necessary for successful study in American universities. This process is costly, both in terms of time and money. The Tunisian government is, therefore, extremely interested in establishing a secondary school program which will permit selected students to enter American universities directly after they receive their baccalauréat.

As part of the planning process which precedes establishing such a program, the Ministry of Education requested assistance from the U.S. government in the form of educational consultants who, together with Tunisian officials, have explored several forms which such a program might take. This report is being written in order to elaborate some of the features which these exploratory talks touched on and to suggest linguistic and pedagogical considerations which must be taken into account before a final plan is developed. This report contains a discussion of the proposal drafted by the Commission for the Lycée Pilote as well as brief discussions of alternative models which should be considered.

2. Tunisian Education Today

In many significant ways, Tunisian education takes a very different form from American education. While the English project need not eliminate these differences, it must be remembered that how learning is achieved may be as important as what learning is achieved. It is clear that students new to the American style of learning must learn more than language if their experience is to be successful.

2.1 Tunisian Education Attempts to Minimize the Effect of Individual Differences Among Students

Beginning with the fourth year of secondary school, Tunisian students are assigned to one of several sections: math-sciences, math-technique, lettres technique industrielle, technique economique de gestion. Thus, a certain amount of attention is paid to the individual student's interests and skills. However, within any one of these sections, the program is fixed. Students pursue a prescribed course of study which is uniform in content and design throughout the educational system. One effect of this is that an individual's interest in a given subject can only be pursued to a limited degree. Another effect is that students do not have any responsibility for selecting programs which truly reflect their interests.

By contrast, American students generally are responsible for selecting at least half of their high school program. If a student is interested in chemistry, for example, he can very often elect several chemistry courses over his four years of study. If he is also interested in literature, he can create a program which reflects this dual interest. Thus, the American student is given a large degree of responsibility for his own education. In addition to this, he is also preparing himself psychologically for the largely independent nature of university study, where he will be expected to be able to study one subject in depth while simultaneously developing competence in a number of

areas outside his major.

2.2 Tunisian Students Focus their Attention on the Baccalauréat

From the first day of secondary education, the Tunisian student is cognizant of the fact that he will be expected to earn an average (or better) grade each year. However, this, in itself, is not sufficient. He must also pass a series of comprehension examinations at the end of his seventh year of secondary school. Thus an "examination mentality" very often governs the Tunisian student's education. It is theoretically possible (and occurs in reality) for a student to pass all his coursework and fail to pass the baccalauréat. Thus, many students fall into the practice of memorization of material presented in class, in the hope that they will be protected from failure. Skills such as critical thinking and creativity are likely to be avoided since their usefulness in terms of the "bac" is minimal.

This examination mentality is reinforced by the style of teaching in many Tunisian schools. For a variety of reasons, some material, some pedagogical, students do not actually conduct scientific experiments. Rather, they watch the experiment as the teacher conducts it, or they read about it in textbooks. Consequently, their understanding of lab procedures and scientific processes is theoretical, rather than actual.

2.3 Tunisian Students Study Many Critical Subjects in a Second Language

While this may be changing, it is presently the case that Tunisian students conduct a large part of their secondary studies in French, a language which is native to very few students. Thus, many students who may be gifted scientifically find themselves hampered by their inability to clearly and precisely express themselves in French. It is clear from Table I that, at present, a knowledge of French is crucial to a student's success. It can be

inferred, and is actually the case, that a great deal of alternating between French and Arabic (code-switching) occurs. While French is currently being decreased in Tunisian schools, it continues to be an important subject, and the availability of French magazines, books, newspapers, television, and cinema ensures that French will not be eradicated as a language of communication in the near future.

2.4 Independent Study is not Encouraged Among Tunisian Students

Again, for both material and pedagogical reasons, Tunisian students do not engage in independent study. No time is allotted for it in the official timetables, students do not enjoy easy access to libraries and laboratories, and it is not seen as being as important as preparation for the "bac." Consequently, students have little experience in research methods, critical reading, scanning, outlining, or report writing. Very often, form is more important than content in essays. While students are expected to work outside the classroom, this work tends to be repetitive of the work presented in class, rather than expanding or reinforcing it.

2.5 Promotion from Year to Year Depends Upon Academic Averages

Because the academic program is fixed, annual success is measured by academic average. Thus, it is possible for a student to fail chemistry, for example, but still be promoted into the next class. The effect of this is, of course, that the student may not get the proper grounding in chemistry to allow him to follow the more advanced course, so he fails that as well. Because class schedules are inflexible, it is impossible to "make up" or repeat a class, unless the year is repeated. This may, in part, explain why something under 50 percent of students who take the "bac" receive a passing score on it.

2.6 Preparation for Tunisian Students Who Wish to Study in the U.S. Must Involve More than Language Training

Without making any value judgments about the system described above, it is clear that preparation for Tunisian students who wish to study in the U.S. must involve more than language training, important as that is. Learning styles, student responsibility, research methods, and critical thinking must all be developed. If the Lycée Pilote is to successfully accomplish its goal, the curriculum must redress the balance between the present Tunisian system and the American. One of the chief stumbling blocks which must be gotten around is the problem of the baccalauréat.

Finally, then, what is envisioned is a high school wherein students will be educated in three languages. Arabic will be used to teach social sciences and belles lettres; French/English will be used to teach science and technology. Insofar as possible, the new program will develop those skills needed in American universities, while allowing students to prepare themselves to pass the baccalauréat.

It is eminently clear that students in this Lycée Pilote will be expected to pass the "bac." Thus, the Commission has tried to plan for two objectives simultaneously which, while not mutually exclusive, may not be totally compatible. In the discussion of options (see below) the reality of these two objectives must be kept in mind.

In the next section of this report, we will describe four possible models to achieve these goals. Two of these have been advanced by the Commission. The other two merit consideration as well.

3. Alternative Models for the Lycée Pilote

.1 Intensive Language Study/Regular University Program

This has traditionally been the most common solution to the problem

of preparing non-English-speaking students for admission to American universities. In this model, selected students are enrolled in three-month to nine-month programs in language centers, often attached to American universities. Upon successful completion of the program, the student is admitted to a university's regular degree program.

In terms of cost effectiveness, this model has much to recommend it. The school system training the student makes no modification in its own curriculum; no special materials are required to prepare the student to go abroad; no particular special training of faculty is required. In short, the sponsoring government expends no money beyond the actual cost of maintaining the student abroad.

A common criticism of this model is that students spend as much as six years to complete a four-year program. While this may sometimes be the case, it is not necessarily the case. If a student received his baccalauréat in June and begins intensive language study in August, he will complete the language program in January or the following June. By enrolling in half-time summer programs, this slow start can be made up by the fourth June after his high school graduation. In short, he will have his first degree four years after completing high school.

It should be noted that many intensive language centers in the U.S. have increasingly begun to integrate cross-cultural information, study-skills training and even ESP (English for Special Purposes) courses into their language programs. If a student comes to the language center with some training in English, that training is taken into account when assigning the student to a learning group.

In brief, then, this model requires no material expenditure. Training is offered only to students who will directly benefit from it. Student motivation is high throughout the training program and a high success ratio can be

predicted, since only students of demonstrated intellectual capacity are selected for the program.

A further refinement of this option might be to send only those students abroad who have completed a first university degree. While the time in language courses would not necessarily be shortened, the overall study time would be, by virtue of the fact that the graduate degree programs allow a specialization which is seldom found in undergraduate programs, most of which require that a student spend as much as two-thirds of his time in "distribution" requirements, i.e., those courses intended to round out the education of undergraduate students.

3.2 Plan as Conceived by the Commission

This plan supposes meeting the stated objectives by means of a Lycée Pilote which would (1) stress math and sciences from the first year of secondary education and (2) provide instruction in English from the first year of secondary schooling. The main features of this school would be the following:

3.2.1 Student Body

A. Entry possible in either first or fourth years. Entry in first year would be based on results of the entrance exam for secondary school; entry in fourth year would be from among those students who had studied English in third year and who had top overall results in that year.

B. All Tunisian students would be eligible for the school, provided they had not repeated a class. Boarding facilities and scholarships would guarantee eligibility of students from other parts of Tunisia and/or from poor families.

3.2.2 Curriculum

A. The basic Tunisian curriculum would be covered in this

school. Only two streams could be followed: math-sciences or math-technique.

B. Courses in the social sciences would be in Arabic throughout the seven years. Math-science courses would be entirely in French in first to third years. In years four to seven these courses would still be in French with the "options" offered in English (two hours of options per week obligatory, four more possible).

C. English language would be taught four hours per week from first through seventh years (with an additional two to six hours per week of classes in English from fourth through seventh years depending on the number of options chosen.)

D. Reinforcement of English would be in the form of summer programs in Tunisia and/or the U.S. or England for all students; a number of intensive programs for those students entering the lycée in fourth year, extra-help classes during the academic year aimed specifically at students entering in fourth, but not excluding any student whose English is not sufficient for academic purposes. Further, extracurricular English language activities such as clubs, films, and lectures would take place.

E. The academic program would offer a "new" pedagogy, which would recognize methods of teaching and learning as being a key element to academic success.

3.2.3 Administrative and Teaching Staff

A. The administrative staff (proviseur and censeurs) would be of various academic backgrounds, for example, math, English, physics, thus guaranteeing the best possible conditions in each major academic area. These administrators would visit the U.S. before the opening of the lycée, in order to study first-hand questions of physical plant, materials, pedagogy, etc., and would thus integrate suitable elements into the Lycée Pilote.

B. Teachers: While an eventual goal would be to have all

teachers trilingual - Arabic-French-English - only a limited number of teachers would be sent to the U.S. in the year preceding the opening of the school: one in math, one in physics and one in mechanical drawing. They would not follow a degree program (which would permit them to move from secondary to other education) but would rather follow a specially designed one-year program composed of an intensive English course, an auditing program in an American university, and practical training in a high school, preferably a scientifically oriented high school, with which the Lycée Pilote has established a twinning relationship. Other teachers would follow at a later time; however, in-service seminars would permit those teachers who hadn't gone to the U.S. to receive training in new methodologies.

3.2.4 Critique of Plan

This plan, as it stands, is specifically geared to meeting the goal of preparing students at the lycée to pass the Tunisian baccalauréat. This it can do without question. Whether, however, it will also meet the second goal of preparing the students for study in an American university is a different matter; that is, the information and skills required to pass the "bac" are not necessarily those which best prepare a student for U.S. academic life. It is thus impossible to predict "success" or "failure" of the plan for this school in meeting the second goal unless the following considerations are fully explored, developed and incorporated, in detail, into the plan:

A. Definition of the Goal of the School

It is necessary to recognize that the two goals of preparing the students for the Tunisian "bac" and preparing them to enter American universities, while not mutually exclusive, are not necessarily best accomplished within the same program. It is therefore essential that the true goals of the school be carefully defined, and that these goals be those which are stated and developed in the plan.

For present purposes of analysis, we are assuming that both goals are of equal importance

B. English Language Preparation

This plan supposes several components of English language preparation, all of which must be maximized if preparation for an American university is to be ensured:

1. Teachers

Must be experienced with solid pedagogical training and top skills in English. It is essential that they receive pre-service and periodic in-service training in the form of workshops which would cover the following topics: use of new language-teaching methods, materials development and evaluation - especially geared to the coordination of English language courses to the content courses offered in English. This also implies training in the special features of English for science and technology (e.g., definition, description hypothesis, drawing inferences/conclusions). These seminars can be organized in Tunisia for weekends or summer vacation periods and staffed by American or British experts. It is desirable that the teachers eventually visit U.S. high schools, perhaps under the twinning arrangement.

2. Content of English Courses

As noted above, the courses must take into account latest teaching methods as well as skills required in the content courses offered in English (and eventually in American universities); not just types of knowledge, but also types of study skills must be developed within the framework of the language class. These skills include critical reading, note-taking, outlining, use of library, and report writing, among others. Both oral and written skills must be stressed.

3. Summer Training

Summer programs must be seen as an integral part of the English training process, not as an optional "add-on" component. While an

intensive summer program with follow-up programs every summer would be desirable, there are three components which are essential:

a) An initial intensive training period of four to six weeks for those students about to enter 4ème directly from other schools;

b) A one-month summer program in Tunisia, probably between 4ème and 5ème, which would provide intensive English training through several means: language classes, science projects and fairs, sports, films, etc., and which would, at the same time, provide a vacation at the seaside. Eventually teachers and students from the "twin" school in the U.S. might participate in this program;

c) A summer visit to the U.S. between the 6ème and 7ème, which would include a home-stay with an American family.

Remedial English

It must be taken into account that not all students will be equally gifted in English, and remedial classes should be scheduled as part of the regular teaching load. While the initial audience for this course will be students entering 4ème, some students who have attended the Lycée Pilote since 1ère may find themselves in difficulty when content courses are first presented in English. Both groups must have access to extra help to avoid falling behind in studies at this crucial point.

5. Use of "Options"

Providing the student with the possibility of taking two or three options means that students will have a minimum of two and a maximum of six content hours per week in English. It must be recognized that even the most serious students often will not take non-required courses, and careful consideration must be given to making all three options obligatory, thus guaranteeing the maximum number of hours in English and maximum chance for success in language preparation.

6. Other Activities

This list is potentially endless: science clubs, drama and film clubs, lectures, songfests, pen pals from the U.S. twin school, activities held jointly with English-speaking schools in Tunis, etc.

C. General Academic Preparation

While it is understood that this plan will respect the content academic courses leading to the Tunisian "bac," there is no reason that the way in which this content is learned cannot reflect those skills necessary for success in a U.S. academic environment: participatory learning, laboratory skills, test-taking, reading, report writing, library and research methods, etc. This approach, while safeguarding performance on the baccalauréat, recognizes that the key to U.S.-style education is every bit as much one of method, both of teaching and learning, as it is of content. Changing methodologies to include these points falls within the range of the "new pedagogical equilibrium" discussed within the plan, and has implications for materials development and teacher training plans which must be considered.

D. Teacher Training

There are two types of teacher training to be considered here, training in the U.S. and in-service training in Tunisia.

1. Training in the U.S.

It must be clarified whether all math and science teachers in the Lycée Pilote are to be capable of teaching in both French and English, or merely those who will be teaching the options. It would seem that those teachers without bilingual capabilities would be at a serious disadvantage regarding both their colleagues and their students. Therefore, it would be advisable that all teachers be sent at some time for study in the U.S. The most immediate concern, however, is sending those instructors who will be teaching in English in the first year of the school's operation. If the opening is planned for the fall of 1981, then the three instructors foreseen in the plan must be sent as of the fall of 1980. The three-part program - English, auditing,

practical training - should be established with a university which offers the first two possibilities, and with a scientifically oriented high school, preferably the future "twin" school, and preferably near the university, for the latter part. The intensive English program (one semester) will be followed by auditing of university courses in both the teacher's subject area and in pedagogy, and by observation-participation in teaching in the high school. While a degree is not considered a desirable outcome of this year, it would be possible to arrange with the university for the awarding of a certificate upon completion of this program. It is important to note that for fall 1980 departure it would be necessary to begin the arrangements for this program immediately. Further, to the extent that all teachers are to be bilingual, a timetable must be established for the training of teachers in the first years of the school, so that by its fourth, when 7ème will first be offered, the trained staff will be complete. Where gaps in staffing exist during this initial period, it may be possible to obtain the services of some Peace Corps teachers or direct-line Americans.

2. Training in Tunisia

As with the English staff, in-service training may be organized in Tunisia. This training would include English for those staff members not yet bilingual, and workshops in methodology and materials as well as seminars in the latest developments in individual fields.

The success of this experimental school rests on careful evaluation, alteration and refinement of its programs each year. Evaluation can come from two sources: the observations of the teachers and administrators as one source, and the administration of standardized English tests, practice "bac" questions, etc., as the other. Based on these two elements, the staff can decide changes to be made in the following year.

3.3 "Mirror Image" Proposal

This plan, which would emphasize the second stated goal of the Lycée, follows the same basic design as the previous plan, except that the mathematics and science courses would be given in English, with the options in French. This formula, as can be seen on the accompanying charts, would keep instruction in Arabic at a constant level, while almost inverting the roles of English and French. It is clear that this plan would increase the chances for success in language preparation for American universities, since the majority of hours of content courses would be given in English. At the same time, French would be maintained as a third language, and since students are, in addition, constantly exposed to it outside of class, there would be little difficulty in maintaining a level of French sufficient for students in Tunisian universities. It might be noted as well that since the original plan calls for the options to be written in English on the baccalauréat, there is no reason that the students would not still do well on that examination having the possibility of writing all their scientific and mathematical questions in English.

Two issues must be given special attention if this "mirror image" plan is to be adopted successfully:

3.3.1 Teacher Training

In this case, there is no question that all teachers must be bilingual in English and that, therefore, large numbers of teachers must be sent to the U.S. for training before the school is opened, or that the school be developed only one year at a time (1ère only, then 1ère and 2ème, etc.). Otherwise, a high level of foreign teacher participation will be necessary in the first years.

3.3.2 Materials

Since the majority of courses will be in English, it will be

necessary either to devise a large number of English-language science material in Tunisia, another undertaking which will require a substantial investment of time, as the materials are initially written, and then refined, over the first years of use, or to select appropriate American or British materials for use, an expensive undertaking.

3.4 Tracking Options

A potential variation of the last two options, not discussed by the Commission, warrants some attention. This is a language tracking system, which would permit a student to choose between a French option, preparing for the Tunisian university, and an English option, preparing for American universities. While this tracking could, in fact, take place throughout the 2ème cycle, such a program would represent enormous expense and duplication of efforts. What is most worthwhile about this idea for the Lycée Pilote is its use in 7ème as a way of linguistically safeguarding all students. For example, if the first option, French courses-English options, is chosen for the Lycée, those students who have been selected to go to the U.S. (and the choices of numbers and individuals should certainly have been made by the beginning of 7ème) would receive all their content coursework for math-sciences in English, with special reinforcement of study skills. Those students remaining in Tunisia would continue with the program as laid out in the original plan, and have no trouble passing the "bac" and beginning their studies in Tunisian universities. If, on the other hand, the English courses-French options plan is chosen, those students who are to remain in Tunisia would take content coursework in French, as well as receive extra instruction in French language in 7ème. They would thus be assured of a successful transition to French-language university work. Those students slated for departure to the U.S. would continue in the basic program. Arabic language and content classes would, of course, be in no way affected by this tracking.

It should be noted that the number of students in each language option can vary from year to year, in function of the number of scholarships available and of personal preference of students. Since the variation would take place only in 7ème, there would be little disruption to the academic program or teacher requirements, and these inconveniences would certainly be offset by the academic security provided to each student.

3.5 A New Curricular Model

A radically different approach to high school preparation for university study would be considered. Unlike the option discussed by the Commission this approach is not linked to existing Tunisian education requirements, although, in point of fact, a student completing the program would probably be successful in passing the Tunisian baccalauréat.

This plan focuses on science and math as they are taught in the U.S. If we accept the statement that the difference between American university training and Tunisian university training is a methodological one, then this model will allow us to prepare students in Tunisia to use the same methodology as students in the U.S.

The basic curricular model for four years might be:

<u>Year</u>	<u>1</u>	<u>Year</u>	<u>2</u>	<u>Year</u>	<u>3</u>	<u>Year</u>	<u>4</u>
Arabic	1	Arabic	2	Arabic	3	Arabic	4
French	1	French	2	French	3	French	4
English	1	English	2	English	3	English	4
Biology	1	Chemistry	2	Physics	2	Physics	3
Chemistry	1	Physics	2	av. Algebra		Trig/Solid Geometry	
Algebra		Plane Geometry	2				

While specific details of the plan would need to be worked out, the following general principles should be noted:

3.5.1 Arabic

The Arabic class would include languages, literature, philosophy, national history, world history and geography. All work normally covered now in the Sciences Humaines would be covered here. A solid foundation in the student's own culture would allow him to evaluate and accept, modify or reject, cultural ideas with which he comes into contact during his university studies.

3.5.2 French

Maintenance of the student's ability to express himself in French is important, since it would allow him to continue to work in a franco-phone culture (or with francophone colleagues) as well as allowing him to meet a general education requirement of most American universities: competence in a second language. However, since most of the student's work would not be in French, this subject should not take up an overly large part of this program.

3.5.3 English

While the obvious purpose of this subject area would be to prepare students to communicate effectively in English, a second, but not secondary, purpose would be to develop the study skills which attendance at an American university requires. Students would be taught to do research, take notes, write term papers and acquire other related skills.

Further, within the framework of the English program, students should be given the opportunity to expand their scientific vocabulary and structure control. The English class would both introduce and reinforce the vocabulary which will be used in chemistry, math and other subject areas.

3.5.4 Teacher Training

Of course, in this model as, indeed, in all the models, teacher

training will be crucial. It is simply true that teachers tend to model themselves on their teachers. Since more of the Tunisian staff will have studied in an environment which differs from the one described here, they will tend, especially in difficult or tense moments, to revert to the more authoritarian practices of the traditional school setting. This must be avoided if students are to profit from this new school. Consequently, all teachers must receive the maximal re-orientation toward discovery learning, participatory management and other basic concepts of this new educational system.

3.5.5 Materials

It is unlikely that appropriate materials can be found for this school. However, a solid library of teaching materials can be established which teachers can draw from in preparing their classes. These materials should be supplemented by materials developed by curriculum committees composed of teachers working in the school. This will not only produce highly relevant materials, but will also sharpen the teachers' professional skills.

4. Factors to be Considered

No matter which of the options described above, or another option not included, is selected, there are several factors which must be borne in mind if the project is to meet with success. While the list given here cannot be considered all-inclusive, it does indicate the range of factors which will be instrumental in instituting a new pedagogical experiment. This is not to suggest that these factors must be reflected in the plan. However, these points should be taken into account before settling on a final plan.

4.1 Linguistic Principles

4.1.1 A bilingual may not have equal control of specific features of both languages. If, for example, one has learned arithmetic in French,

one may be more comfortable performing mental mathematical processes in French than in Arabic, even though Arabic is the native language. The obvious implication for this project, then, is that one must guard against uneven language development, if students are to be truly bilingual or trilingual. If chemistry is taught only in English, one cannot assume that the students will automatically learn the language of chemistry in French or Arabic.

4.1.2 In general, it is easier to learn a second language (L2) if the L2 is used to teach a subject other than the language itself. Study of the language as a language, while initially necessary, becomes less important as students develop fluency.

4.1.3 Psycholinguistics has demonstrated that two people who share a native language will speak a second language only in certain special circumstances. In this proposed project, sharers of two will be communicating in a third. While this will pose only minor problems in traditional academic settings (laboratories, mechanics shops), the temptation to speak French or Arabic will be great. While no one should be reprimanded for speaking his native language, the teacher should make every attempt to encourage students to use English as a mechanism of communication.

4.1.4 Intensive study of a language must be reinforced by long-term exposure to the language. When attempting to integrate the intensive summer programs into the regular curriculum, this fact should be considered. The intensive program will reinforce, not replace, long-term (extensive) exposure to, and study of, language. (See 4.1.2, above.)

4.1.5 Learning a language is easier in an environment where the language is widely spoken. If possible, at least one summer program should be attended in America or England. While this may not be possible for all students, it will be possible to establish a "mini-environment" where English is spoken by everyone. This is, of course, the principle of immersion programs.

A corollary to this statement holds that initial exposure to a new language might better be extensive than intensive. In any event, learners of a new language, whether in an intensive or extensive program, should not be dropped into the language and be expected to "catch" it, as if fluency were contagious.

4.1.6 The distinctions between English as a Second Language (ESL) and English as a Foreign Language (EFL) are not artificial. Students here will be students of EFL but will be expected to perform at ESL standards. Therefore, all teachers must possess excellent English fluency. The acquisition of an American or British accent, of course, is not a significant language-learning goal, although comprehensibility is. Over-attention to pronunciation will probably be counterproductive.

4.1.7 Language is both a maker and a mirror of culture. One perceives the world differently in all languages. Language is not simply vocabulary and structure. This is not to suggest, of course, that one must accept the values of the culture which speaks the language studied.

4.2 Pedagogical Principles

4.2.1 It is crucial that administrators of the new Lycée be given the opportunity to study American teaching methodology. Since these people will have responsibility for implementing a very new system of learning, they must be convinced of its efficacy, and they should be aware of pitfalls which they can avoid.

4.2.2 Teaching and learning styles are a reflection of the culture which carries them out. While an "American" lycée is not appropriate for Tunisian students, the principles which govern that system must be carefully studied and adapted, as appropriate to Tunisian realities. In any case, students must be trained to learn in a particular manner if they are to succeed in American universities.

4.2.3 A student may have an aptitude for science but not for language, and vice versa. In order to protect a good science student for whom language study is difficult, teachers should be prepared to give supplementary assistance. If problems are detected early, they are easily corrected. If too much time passes, the student may begin to fail his science classes simply through inability to comprehend the language used in class.

4.2.4 Students develop different academic attitudes as a function of the schools in which they study. If "discovery learning" or self-responsibility is important and is rewarded by the education system, students will develop these characteristics. If, however, all learning is geared toward successful completion of comprehensive examinations, we would expect to see a corresponding attitude of intellectual conservatism.

4.2.5 Consistency in the classroom is essential if students are to have a sense of security. If the faculty and administration of the school and the appropriate officials of the Ministry of Education are not wholly committed to the success of the project and the efficacy of its elaboration, then the plan will probably not be successful. This does not mean that self-criticism is to be discouraged. The criticism must, however, be constructive.

4.2.6 Children tend to respond to the expectations adults have of them. If children are constantly told, explicitly or implicitly, that a program is very hard, or a timetable is over loaded, they will reflect that attitude in their achievements. If children are expected to be successful and encouraged to be successful, they usually will be.

4.2.7 If flexible scheduling is permitted, individual differences among students can be considered. By scheduling all physics classes at the same time, for example, a 6ème student could take a 5ème physics class which

he had failed. Thus, the school could allow for differing growth rates. If physics classes and options were staggered (11:00; 4ème and 6ème physics; 5ème and 7ème physics lab; 12:00 4ème and 6ème physics labs, and 5ème and 7ème physics) this might be even more effective. In any case, flexible schedules would permit the school to maximize success. They would, of course, also necessitate increased bilingual staff.

4.3 Physical Plant

The physical plant of the Lyceé should reflect the attitudes toward and style of learning which will be carried out. The following recommendations should be given careful consideration:

4.3.1 Classrooms

Stages (estrade) encourage the delivery of lectures as a primary means of dispensing knowledge. Furthermore, they reinforce the symbolic distance between teachers and students. They may not be appropriate for this institution.

Similarly, classroom furniture should be functional and flexible. While a lecture hall may need seats lined up in neat rows and fixed to the floor, a classroom wherein a variety of teaching styles will be used will require a flexible arrangement of furniture. This will permit easy division of students into working groups of various sizes, as required by the teaching program.

If possible, each student should be assigned space wherein he may store ongoing projects when he is not actually working on them. Displays of student work will, of course, encourage excellence.

4.3.2 Scier

These would be designed in such a way that each student will have access to the necessary work space and sinks. Enough equipment should be on hand so that each student may carry out experiments and learn to manipulate the instruments of his future profession. Whenever possible, allowing for

individual and class schedules, free (but supervised) access to the laboratories should be permitted and, indeed, encouraged. Of course, necessary safety equipment should be easily accessible and each student should be trained in its proper operation.

4.3.3 The Library

The library should contain a variety of materials, both standard reference works (dictionaries, encyclopedias, thesauri) and more specialized works, including journals, magazines, and standard supplementary works for each subject. If possible, a general interest collection should also be housed in the library.

Students should be trained to locate materials in the library and should be encouraged to use the library. Open access shelves will be essential for aiding in this development.

In addition to print works, a collection of microfiches (and readers) might be installed. It is possible that an arrangement with the Educational Resources Information Clearinghouse (ERIC) system, a project of the Department of Health, Education and Welfare, can be made.

Further, the library can have a collection of audio cassettes which can be used in the language laboratory for comprehension practice. A possible cooperative venture with the Faculté de Science of the University of Tunis might be undertaken wherein university students, within the frame of their own English classes, would prepare and record short talks on various scientific subjects. These topics could then be used in the Lyceé to give students practice in listening to scientific English.

4.3.4 Language Laboratories

As with science laboratories, students should be able to enjoy easy access to the language laboratories. While these will be initially

valuable for practicing basic English structures, they will be of continuing value if used as a media center where comprehension exercises may be undertaken.

4.4 Teacher Training

4.4.1 Teachers tend to imitate their teachers. Despite careful academic training, most teachers, especially if insecure or threatened, will revert to methods which they have seen when they were students. To minimize this reaction, teachers should develop positive attitudes toward the complementary roles of teachers and students.

4.4.2 All teachers should be given the opportunity to develop their English language skills. Teachers should also be helped to develop sound linguistic attitudes: language competence is not necessarily a sign of native intelligence; no language is "better" than any other; no dialect is "purer" than others, etc.

4.4.3 Ongoing in-service training will be crucial for the faculty, especially if most teachers have not taken pedagogy courses at the university. This is an area which the "twin" school faculty may help develop.

4.4.4 Creative approaches to teaching, such as team-teaching, peer-tutoring and faculty-student projects, should be encouraged. At the same time, teams of teachers should be given the opportunity (and time) to develop teaching materials to be used in the school. If, for example, an English teacher and a chemistry teacher work together, they can produce materials on chemistry in English, at the student's level. This will be especially important in view of the foreseeable difficulty of finding texts of sufficiently complex content and in English of the correct degree of difficulty.

4.5 Evaluation

Evaluation of this project must be ongoing in nature. At least once a semester, the conseil de classe as well as individual specialization teams

should formally evaluate the students' progress, the daily operation of the school, and the relationship of courses to one another. In view of the fact that real students are involved in this project, prompt attention must be given to any indication of academic weakness.

Outside evaluation, in the form of standardized tests and visiting experts, should be undertaken as part of the total evaluation. Further, visits from Tunisian teachers will be mutually beneficial.

5. Conclusion

This report has not attempted to present the Definitive Plan for the Lycée Pilote which will be established. Rather it has sought to situate the Lycée in a context, both Tunisian and American; to raise the fundamental questions which must be asked, and issues which must be considered, in order to successfully plan such a Lycée; and, finally, to sketch outlines of possible plans, based on differing goals which may be set for the school.

To the extent that this document will cause those questions to be asked and those issues to be discussed in the final planning of the Lycée. whatever the decisions taken, it will have been a success.

David Holdzkom

Myrna Norris

Tunis

29 October 1979

Appendices

Report of the Commission

Table 1 Present Distribution of Subjects by Language

Table 2 Proposed Distribution for Math-Sciences

Table 3 Proposed Distribution for Math-Technique

Table 1

Math-Science

Number of Hours and Percentages of Arabic, French and English (Present Distribution)

Year	Total Hours	% Arabic	% French	% English
1-2	27	61	39	0
3	28	50	50	0
4	25.5	41	47	12
5	28	36	53	11
6	29	33	57	10
7 (A)	26	17	83	0
7 (B)	24	27	65	8

Math-Technique

Year	Total Hours	% Arabic	% French	% English
4	32	25	62.5	12.5
5	35	23	66	11
6	34.5	20	71	9
7 (A)	28.5	7	93	0
7 (B)	29	16	77	7

Table 2

Math-Science

Number of Hours and Percentages of Instruction in Arabic, French and English as Proposed in the Commission's Plan

(Notes:

1. The tronc commun (1-3) is the same in both formulas.
2. The figure given in parenthesis represents the percentage of instruction of language as language rather than as a communication mode. This is a percentage of total class time and does not change from formula to formula.
3. "Total hours" is calculated on the maximum number of hours of instruction available. Totals and percentages assume that maxima are elected.)

Formula 1 (French Courses/English Options)

Year	Total Hours	% Arabic	% French	% English
1-3	28	45 (14)	41 (14)	14 (41)
4	31	29 (10)	39 (10)	32 (12)
5	33	24 (9)	45 (9)	30 (12)
6	34	24 (8)	47 (8)	29 (11)
7	30.5	16 (0)	51 (0)	33 (13)

Formula 2 (English Courses/French Options)

Year	Total Hours	% Arabic	% French	% English
4	31	29	29	42
5	33	24	27	48
6	35	24	26	50
7	30.5	16	20	64

Table 3

Math-Techniques

Number of Hours and Percentages of Instruction in Arabic, French and English as Proposed by the Commission

(Notes:

1. The tronc commun (1-3) is the same in both formulas.
2. The figure given in parenthesis represents the percentage of instruction of language as language rather than as a communication mode. This is a percentage of total class time and does not change from formula to formula.
3. "Total hours" is calculated on the maximum number of hours of instruction available. Totals and percentages assume that maxima are elected.)

Formula 1 (French Courses/English Options)

Year	Total Hours	% Arabic	% French	% English
1-3	28	45 (14)	41 (14)	14 (14)
4 ^{ème}	34	24 (8)	53 (8)	23 (12)
5 ^{ème}	37	22 (8)	56 (8)	22 (11)
6 ^{ème}	37	19 (8)	59 (8)	22 (11)
7 ^{ème}	33.5	15 (0)	61 (0)	24 (12)

Formula 2 (English Courses/French Options)

Year	Total Hours	% Arabic	% French	% English
4 ^{ème}	34	24	21	55
5 ^{ème}	37	22	19	59
6 ^{ème}	37	19	19	62
7 ^{ème}	33.5	15	12	73