REPORT OF THE WORKSHOP ON CREATING TEACHING MATERIALS FOR PREPARATORY SCHOOLS IN EGYPT WITH THE USE OF LOCAL MATERIALS

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by
Maude White

Contractor:
Academy for Educational Development
1414 22nd Street, N.W.
Washington, D.C. 20037

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E. Daily Schedule - Maude White
I. SUMMARY STATEMENT

I was asked to do the following job: to assist the Ministry of Education in planning and conducting a workshop in low-cost teacher-made instructional materials. The scope of work included the following:

1. Before arrival in Cairo, I accumulated resource materials and helped prepare detailed curriculum materials particularly in science.

2. On arrival in Cairo, I planned with the general director, Guirguis Risk Assaad, the details of the workshop in consultation with the U.S Agency for International Development and the Ministry of Education.

3. I trained the staff for leadership in areas of (1) evolving goals and objectives for their roles, (2) teaching for higher levels of learning, (3) developing evaluation skills and giving teaching demonstrations, and (4) planning the two-week workshop schedule in detail.

4. During the workshop, I led many group presentations, both small and large. I worked with individual teachers on projects, held daily staff meetings for evaluation and planning, and served as resource person for all the leaders.

5. Following the workshop, I assisted in an in-depth evaluation of the workshop by the leadership staff. Based on the evaluation of the staff, individual teacher evaluations, and my own, I have made recommendations for the future.
These recommendations will assist the Ministry of Education in planning future workshops. The evaluations of teachers, the leadership staff, and the consultant indicate a vital need for training teachers on a continuous basis. Such workshops will certainly be an essential method of providing this training.
II. INTRODUCTION

This workshop on teacher-made materials was a follow-up to a similar one held in Cairo in the summer of 1977 for primary school teachers. The Ministry of Education had received numerous favorable responses from teachers about the manual that was published in 1977 and widely distributed among teachers, showing how many materials could be made at almost no cost. These materials could be used to raise children's level of learning from memorization of facts to higher levels of understanding so that students could be more creative in thinking and solving problems.

McMillan publishers had ready in draft form the science material *Investigating Science With Children* for use in the workshop. The approach of the McMillan series is to change the teachers' attitude, their concept of method, and their objectives, so that the altered classroom situation leads to pupil participation in scientific investigations. By doing this investigation, the pupil learns through discovery rather than through the memorization of facts; he or she learns to think scientifically rather than simply know facts about science.

Even though the books were prepared for primary schools, many activities were suitable for preparatory curriculum. It was decided to use this material in the workshop in science and social studies to help teachers become familiar with using an investigative approach to learning.

COMMENT

The value of having material such as *Investigating Science with Children* was unquestionably positive. More materials should be prepared in this manner, using a new investigative approach to learning, and should be published in Arabic. Teachers were asking for such materials in every group on every level.
III. PREPARATION

Prior to the consultant's arrival in Cairo, Bob El Louk Training Center for Primary Teachers had been chosen by the Ministry of Education as the site for the workshop. A leadership staff of thirteen persons from the Cairo area had been selected. The mathematics workshop had three leaders, and there were four each for social studies and science. Two leaders handled the administrative details of registration, purchase of materials, finance, and other local details.

Teachers from preparatory schools in all of the educational zones in Egypt had been invited to come through a letter to the administrator of each zone requesting that three teachers be chosen, one for each area of science, mathematics, and social studies.

The pre-workshop staff training program began on June 16 and continued through June 21. The staff-participants chose the following goals and objectives for the workshops:

GOALS

1. To raise the level of learning from rote memorization to mastery and understanding of concepts (see Appendix B).

2. To develop the skill of teachers in process as well as in facts; to teach students to think scientifically rather than simply learn about science (see Appendix C).

3. To create low-cost teaching/learning materials which will make it possible to achieve goals 1 and 2.

OBJECTIVES

1. Be familiar with the six levels of learning and the methods required to achieve each level.

2. Develop skill in teaching methods which require student participation.

3. Develop skill in creating and producing low-cost teacher-made materials for these methods.
4. Develop skill in the use of audiovisual materials.

5. Develop the capacity to evaluate the effectiveness of materials against Bloom's "levels."

The leadership staff planned separately as three groups in science, mathematics, and social studies. These plans included ways to orient each group to the goals and objectives of the workshop. Materials were purchased for beginning projects. Two rooms were prepared for workshop activities for each of the three groups. Some media materials were set up in a room to serve as a library. The theater was prepared for general meetings.

Since a manual would be published after the workshop that would include the best teaching materials, criteria were agreed upon for evaluating these materials. Each teacher would submit a drawing of the model, a list of needed materials for construction, approximate cost, a description of how to construct the model and how it could be used to help raise the level of learning. A core group of leaders would decide on the materials that would be included in the manual.

COMMENTS

The following suggestions are made for planning future workshops:

1. There should be explicit information on grade levels and curriculum content available to the consultant in time for appropriate resources to be prepared in advance before arrival in Egypt.

2. The consultant should arrive in time to have a minimum of a week to work with the MOE on local detail planning.

3. The site should be chosen for optimum convenient working space and for the comfort of the participants. A residential facility would facilitate housing, meals, and a longer working day.

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IV. THE WORKSHOP

OPENING DAY

The workshop opened with 70 participants and increased to 90 by the third day. Some arrived late because of delayed communication about their having been selected to attend.

Dr. Halem Grais presided over the opening session and told the teachers attending that the aim of the workshop was to raise the level of learning in preparatory schools. He emphasized the use of the science book *Investigating Science with Children* as a means to become familiar with new methods of teaching. Mr. Fred Kobrak of McMillan publishers gave a brief history of how the material was adapted for Egyptian schools, and he asked for evaluation of the material from the participants.

Dr. Monsour Hussein, Deputy Minister of Education, gave the main address. He also stated that the purpose of the workshop was to help raise the level of education in preparatory schools through the use of teacher-made audiovisual aids. He stressed the teachers' role as being the most important element in the school. He stated that the Ministry now encourages teachers to use new approaches and that teachers exert freedom in adjusting the teaching method to meet the needs of classroom situations.

DAILY SCHEDULE

The daily schedule, with some variations, included a general meeting of the entire group. Then three hours were spent in one of the three workshops: science social studies, or mathematics. The staff met an additional hour each day to evaluate, solve problems, and make future plans (see Appendix D).

WORKSHOP SESSIONS

The leaders prepared the teachers for making teaching materials by having available the syllabus of each level and reviewing the content to determine what areas were most critically in need of visual aids. The practical aspects of the
use of paints, papier maché, carpentry, and metal work were taught by two technicians and some of the teachers. There was a sharing of "know-how" among the group which provided additional interaction and learning.

Teachers were encouraged to sketch the models and list materials needed before beginning construction. Social studies groups worked on various types of maps and globes, models of the solar system, and many charts related to population growth, food production, and natural resources. Science groups made many models showing science concepts, drawing heavily on the McMillan series. The mathematics group made three-dimensional shapes, charts, games, compasses, protractors, and numerous other aids for teaching mathematics.

The consultant spent time in all of the rooms evaluating work, making suggestions, and encouraging teachers who were hesitant to try something new. There was noticeable improvement in the teaching materials created as the workshops progressed, particularly in the size of models and their attractiveness and usefulness in teaching for higher levels of learning.

GENERAL SESSIONS

The following lectures, films, demonstrations, discussions, and field trips were included in the two-week workshop schedule:

LECTURES:

1. Local Materials
2. Producing Low-cost Materials
3. Food Production in Egypt
4. The Role of the Teacher
5. The Nature of the Adolescent Learner
6. Critical Problems in Education and New Solutions

FILMS:

1. "Future Shock" - Depicting the collision of the past with modern technology development.
2. "Let them Learn" - Showing the value of the use of a variety of audiovisual aids for increased concept development in classroom teaching.

3. "Higher Cognitive Questions" - Demonstrating the skill of questioning to achieve higher levels of learning.

**DEMONSTRATIONS:**
1. The use of audiovisual aids - chiefly the overhead projector and models of the human body and solar system.
2. The use of a mathematics kit for individualizing learning
3. Demonstration of models made in workshop by teachers
4. The use of simulation games and small-group activities in teaching social studies.

**DISCUSSIONS:**
2. Large-group discussion and compilation of problems and solutions discussed in smaller groups.

**FIELD TRIPS:**
1. Overnight trip to Alexandria to tour the Graeco-Roman Museum and the Marine Biology Museum.
2. Tour of the Cairo Museum.
3. Tour of Old Cairo's ancient mosques, churches, and the citadel.
4. Tour of the pyramids.
PROBLEMS THAT WERE IDENTIFIED by preparatory teachers in the general session that was spent in discussing their professional concerns were as follows:

1. The school does not teach the student **how to learn**.
2. The school does not prepare the student for decision-making in life. Unless a student attends a university, there is little vocational preparation.
3. Some teachers are transferred to other schools during the academic year, always the less-experienced teachers.
4. Teachers feel that personal psychological needs are not recognized in some cases, such as the need for positive reinforcement for work well done or help with school problems; and they have few opportunities to voice their opinions.
5. Classes are large in many schools.
6. There is a wide range of student ability grouped together in one class, and the teacher must teach all the same curriculum materials.
7. Many students are upgraded from primary schools who are not capable of learning the preparatory curriculum.
8. There are inadequate evaluation techniques, namely, the examinations.
9. Many students become school dropouts with no provision for alternative educational programs.
10. Some teachers have an overload of class preparations per week.
11. There is a lack of equipment for teaching, laboratories, and audiovisual aids.
12. Laboratory technicians who are graduates of technical schools are assigned to the schools. They do not understand educational goals and do not offer adequate assistance to teachers in securing laboratory equipment and keeping it in proper condition.
13. There are either no libraries or extremely poor ones.
14. The short school day is not adequate for instructional time needed in many areas of the curriculum, especially third-year social studies and mathematics.

15. Many school buildings and yards do not provide adequate space for classes.

16. Many students have health problems and poor nutrition that interfere with academic success. There is a lack of medical care to deal with these problems.

17. The school and home often do not have a link to deal with common problems. This results from (1) lack of time by parents and/or teachers; (2) the feeling by parents that the school only wants the parents to help with maintenance of the buildings; and (3) the teachers' hesitancy to have parents become involved when they may not understand the goals in the educational system.

18. Some teachers lack professional training.

20. Some supervisors are too traditional and do not welcome new approaches to teaching and learning. This is because the inspector may be evaluated by the scores of the examination in his area, and he fears changes.

**Solutions** that were suggested by preparatory teachers to the problems listed above:

1. The budget of the Ministry of Education should be greatly increased.

2. School buildings, school yards, laboratories, and libraries need to be improved.

3. The curriculum needs to be improved, especially in areas that relate to local environmental problems.

4. There is a need for teaching methods that actively involve the student in the learning process.

5. Teachers need meaningful, regular in-service training.

6. Teachers' professional status should be upgraded through preparation,
salary, and a voice in planning. This applies at all levels but most critically for primary teachers.

7. There is a need for new evaluation techniques that would be appropriate for an improved curriculum and would replace the present examination.

8. All agencies concerned with the educational process should have a unified cooperative plan. This should include teachers and parents as well as governmental agencies.

COMMENTS

The discussion of problems and solutions by the teachers was lengthy, thought-ful, and provocative. Undoubtedly, they value the opportunities that the workshop provided for such discussions.

THE FINAL DAY

The three workshop groups of science, social studies, and mathematics created many teaching materials. The best models were chosen for display, and the last day of the workshop gave everyone an opportunity to visit all the displays and see the work done by all their colleagues. A number of visitors from the MOE and AID also visited and toured the exhibits.

Most of the materials were taken home by teachers to use in their own classrooms. Some larger maps and charts were taken to the Audio-Visual General Department and to the MOE for display.
V. EVALUATION

Evaluation was an integral and continuous part of the workshop. The staff evaluated each session on a daily basis. Projects at all stages of planning and development were evaluated.

STAFF EVALUATION AND RECOMMENDATIONS

The staff made strong, positive statements that the workshop was valuable in every respect and met critical needs that teachers have in learning new methods to improve their teaching.

The staff felt so strongly about the value of such workshops that they made the following recommendations for future workshops:

1. Entitle the next workshop "Developing the Educational Process through the Creation and Use of Audiovisual Aids."

2. Hold workshops in many areas throughout the country in order that they will be accessible to more teachers and also because local materials can be used.

3. Plan workshops in residential settings such as dormitories so that a longer day will be possible and there will be more working space for construction of materials.

4. Plan workshops either simultaneously or separately for administrative leaders (supervisors and inspectors) so that they will understand the aims and objectives which are chosen.

5. Plan a core curriculum for at least a part of the workshop in which all groups work on aspects of a common problem such as population control or food security.

6. Provide participants in advance, through printed information, with specific information about the workshop such as goals and objectives, schedules, and materials needed.
7. Relate more audiovisual materials such as films more directly to Egyptian schools; provide more new curriculum materials in Arabic such as the McMillan science series **Investigating Science with Children**.

8. Consider holding workshops at more suitable times such as the mid-year two weeks' vacation period and earlier in June.

9. Devote general sessions of the workshop to learning practical skills such as use of paints, papier maché, carpentry, etc.

10. Initiate a follow-up plan of communication with participants by the teaching staff of the workshop, in both classroom visitation and a quarterly letter with feedback from teachers and information about teachers' use of materials and methods of teaching.

11. Mass produce some materials that have been developed and distribute them to classroom teachers (to be carried out by MOE).

12. Send manual which describes and illustrates the workshops to all participants; send one copy to each preparatory school.

**EVALUATION AND RECOMMENDATIONS OF PARTICIPANTS**

Participants were asked to evaluate the workshop and make recommendations for future ones. The consultant worked with Dr. Adly in preparing the following evaluation questionnaire. It is given in full as translated by him. The figures are percentage ratings based on the responses of 60 participants:
Dear Colleague:

This evaluation sheet is divided into two sections. The first comprises questions with five-point scale answers. The second comprises open-ended questions. The aim of this sheet is to evaluate the workshop and to benefit from your ideas in developing better workshops in the future.

Answer all questions.

Do not write your name.

Notice that there are no right or wrong answers.

**FIRST SECTION:**

Read the following questions and mark ( ) in front of the answer which express your judgment:

1. To what extent was the period dedicated to the workshop sufficient?
   - 27.2 Quite sufficient
   - 46.52 Sufficient
   - 2.88 Not sufficient
   - 2.88 Can't judge

2. To what extent were the materials sufficient?
   - 29.9 Quite sufficient
   - 54.04 Sufficient
   - 11.52 Not sufficient
   - 7.2 Can't judge

3. To what extend did the leaders give you the chance to do the aid or experiment you feel needed in preparatory schools?
   - 59.46 Great extent
   - 37.70 Fair extent
   - 5.76 Can't judge

4. To what extent were the leaders willing to answer your questions?
   - 69.52 Great extent
   - 25.58 Fair extent
   - 4.32 Can't judge
5. To what extent did you and your colleagues cooperate?
   67.28 Great extent
   28.46 Fair extent
   2.88 Can't judge

6. To what extent did you gain new ideas from your colleagues?
   42.52 Great extent
   50.1 Fair extent
   4.3 Can't judge

7. To what extent were the lectures useful?
   15.14 Great extent
   66.21 Fair extent
   7.2 Can't judge

8. According to your feelings, how did the time for the workshop pass?
   43.28 Very quickly
   37.88 Quickly
   7.2 Can't judge

9. To what extent did the work in the workshop interest you?
   74.20 Great extent
   22.7 Fair extent
   4.2 Can't judge

10. To what extent was the workshop helpful in making you believe that
    the real value of the aid depends on the achievement of the educational
    goals.
    76.74 Great extent
    15.4 Fair extent
    5.76 Can't judge
11. To what extent did the films achieve educational objectives?

- 46.52 Great extent
- 38.64 Fair extent
- 8.64 Can't judge

12. To what extent was the translation clear?

- 79.2 Great extent
- 11.52 Fair extent
- 5.76 Can't judge

13. To what extent was the place chosen for the workshop suitable?

- 42.52 Great extent
- 32.78 Fair extent
- 5.76 Can't judge

14. To what extent did the workshop achieve its objectives?

- 42.72 Great extent
- 51.16 Fair extent
- 8.64 Can't judge

15. To what extent did you feel the aids you made will be useful in your classroom?

- 85.4 Great extent
- 12.96 Fair extent
- 2.88 Can't judge

SECOND SECTION:

Read the following questions carefully and answer each of them in the part reserved below the question.

Additional papers for detailed answers are permitted. Please write the number of question.

16. Was the workshop well planned?

If the answer is NO, state why, and how it should be planned.
1. Lodging of participants coming from outside Cairo was not adequate.
2. The physical location of the workshop was not adequate - not enough tools and technicians or space to work.
3. Previous knowledge of what the workshop was about not given to participants.
4. Some lectures were not useful.
5. Too short a duration of the day to complete projects.

17. What were the difficulties you faced in this workshop which the leaders didn't try to solve or couldn't solve?
1. Letters sent to participants were late in some cases.
2. Lodging problems
3. Lack of technicians
4. Some leaders did not have ideas about new materials.
5. Waiting for materials to be purchased for projects.

18. What were the educational objectives you achieved in this workshop?
1. Working in groups.
2. Using a scientific approach in producing projects.
3. Visiting historical sites in Egypt.
4. Simplifying audiovisual aids.
5. Preparing good lectures and showing useful films.
6. Practicing a foreign language (English).
7. Gaining experience from the leaders.
8. Using many AV aids to achieve the development of more than one concept.
9. Using simple local materials to produce aids.

19. What was the most and the least useful lectures given in this workshop?

The best - Dr. Applegate's lecture
The least value - "Food security" by Dr. Eyoub. (His information was not
expressed clearly and forcefully).

20. What are the things you wished to have in this workshop, but the plan didn't include?

1. More technicians to show how to do carpentry, painting, papier maché, etc.
2. More films and AV equipment for information and learning how to use them.
3. Instruction in how to do welding, painting, etc.

21. What are your suggestions for the development of similar workshops in the future?

1. Hold in Alexandria.
2. Residential facility so that there can be more time daily.
3. Have more materials on hand for construction purposes.
4. Longer duration (3 weeks).
5. Have more educational films.
6. Have more leaders.
7. Inform participants at least 3 weeks in advance through printed materials about the type of workshop.
8. Hold similar workshop annually or more often.
9. Have recently published textbooks available.
10. Have technicians who can teach and assist with construction skills.
11. Have information on AV aids so that teachers can learn about their availability.
12. Give practice in how to handle AV equipment.

22. What are the questions that should be considered, but they are not included in this evaluation sheet?

Write the questions and the answers.
1. Do you want lodging in the location of the workshop?
   Answer: Yes
2. Can you convey what you have learned here to your school?
   Answer: Yes
3. Did you gain much from the American expert?
   Answer: Yes

EVALUATION OF MCMILLAN SCIENCE SERIES INVESTIGATING SCIENCE WITH CHILDREN

A further evaluation of the McMillan science series was done by the science section of the workshop. The summary is listed as follows:

1. ISWC is an excellent approach which needs to be used in Egyptian schools.
2. It creates the urge to learn among students.
3. It develops a scientific approach to problem solving.
4. It develops creative thinking.
5. It gives students practice in discussions and acceptance of the ideas of others.
6. It develops skills.
7. It links science with the environment.
8. It demonstrates using simple experiments that lead to understanding scientific facts.
9. Students gain confidence in carrying out experiments.
11. The learning will be more lasting than just memorization of facts.
12. The students will learn how to follow the same steps in solving future problems, in other words will learn process skills.
RECOMMENDATION BY TEACHERS AND STAFF

A plan should be made by the MOE to develop immediately science textbooks based on the same investigative approach to learning for preparatory science curriculum. Some members of the science teaching staff are eager to work on such a project.

CONSULTANT'S EVALUATION

The recent report of the studies by the Basic Education Committe and the Molenda/DiPoala Analysis of problems and possibilities of the Audiovisual General Department clearly recommend that any new effort to improve Egyptian schools will have to attack multiple problems in a coordinated and systematic way if any progress is to result.

President Sadat has stated repeatedly that the Government of Egypt has committed itself to a policy of providing quality education with equality of opportunity for everyone. This will prove to be an enormous task for a nation of 41 million people which is still growing rapidly in population density.

Unquestionably, workshops such as this one will be one small phase of a larger complex, long-range plan to bring about a good education program that makes changes at all stages of the education system and that uses teaching methodology to foster and build individual personalities which are independent, self-directed, and self-controlled.

Teachers reiterated many times the need for practical opportunities like this to learn new skills and methodology, to create new teaching materials, and to share ideas among themselves.

COMMENTS

If future workshops are planned, these recommendations should be considered:

1. The consultant should have in writing well in advance:

   a) the goals of the Ministry of Education and the U.S. Agency for International Development;
b) the academic teaching level of the teachers (primary, preparatory, secondary)
c) the disciplines for which materials are to be created (social studies, science, mathematics).

2. The site chosen should be comfortable and provide working space for meeting workshop objectives. The Bah El Louk site does not meet these criteria.

3. More materials in Arabic on teaching methods and materials should be produced as soon as possible, such as films, filmstrips, transparencies, etc., to aid in the successful teaching of their use.

4. When more than one academic discipline is included in a workshop, much more could be accomplished if the staffing pattern also included curriculum specialists in each area.

5. Classroom teachers should have a voice in planning so that their needs and desires for learning resources will be met.

From the two workshops that have been held in Cairo, there have developed some Egyptian leaders who are effective in their roles. Guirguis Risk Assaad assumed responsibility for the overall planning and showed tremendous growth during the process for planning and leadership. Dr. Adly was invaluable as the translator for the consultant, as well as a leader in science.

Two additional needs have been evident in both the workshop of 1977 and the one in 1979:

1. Teachers are eager for some intensive review in the use of the English language. If workshops are in a residential setting, such an addition would be possible. Many of them have not used conversational English enough to speak fluently and have asked for this opportunity to study the English language.

2. The consultant senses a need for more emphasis on child and adolescent psychology. Since most of the teaching is done to a whole class in Egyptian schools, there is a definite tendency among teachers not to think in terms of individual students. This appears particularly crucial in the preparatory school years. The emerging
adolescent becomes increasingly social and needs a school setting that supports this need. Physical growth in this period is dramatic. The most rapid physical changes of the entire life cycle occur during this time. Intellectual and emotional development in the early adolescent years varies widely. Such diversity is a normal developmental phenomenon and is one for which the curriculum must provide.

The Faculty of Aim Shams University has carried on two studies that are relevant to the needs of Egyptian adolescents. Each of these studies indicates that at least half of the students between ages 12 and 15 do have needs that are not being met. Some of them are the lack of a friendly adult to talk with, the lack of hobbies, clubs, and other extra-curricular activities, and inadequate sex education.

The two requests of teachers mentioned above (to have an opportunity to improve English language skills and further study of the adolescent learner) could be included in a future workshop. With teachers residing at the workshop site, there would be time to form groups in these areas on a voluntary basis. Of course, the staffing pattern would need to include leadership for them.
APPENDICES
APPENDIX A

BACKGROUND INFORMATION ON ADAPTATION OF INVESTIGATING SCIENCE WITH CHILDREN FOR EGYPTIAN SCHOOLS
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BACKGROUND INFORMATION ON ADAPTATION OF INVESTIGATING SCIENCE WITH CHILDREN FOR EGYPTIAN SCHOOLS

Mr. Fred Kobrak of the International Division of McMillan Publishers saw the report of the 1977 workshop led by the consultant (Maude White) and suggested that a similar approach to learning used in the workshop had been published a few years ago for American teachers.

In the spring of 1978 a meeting was held in Washington, D.C., attended by Dr. Monsour Hussein, Deputy Minister of Education; Dr. Halim Grais, Under Secretary of Preparatory and Secondary Schools; and Zoki Nashid, General Inspector of Science, all of the Ministry of Education of the Arab Republic of Egypt. Also in attendance were Fred Kobrak of McMillan, Dr. John McClain, Director of the Research Learning Center of Clarion State College, and Maude White, American consultant.

A whole morning's discussion was devoted to finding a way to fit this approach to learning into primary schools in Egypt without major changes in the curriculum. A decision was made to adapt the material for use. The writer, with recent experience in both Egyptian and American primary schools, was to decide which activities were usable, and the general inspector of science was to adapt the activities chosen to Egyptian materials. Dr. Adly Kamal Farog, who was eminently qualified through a lifetime of teaching science, was chosen to do the Arabic translation and to suggest other adaptations based on this experience.
APPENDIX B

THE SIX LEVELS OF LEARNING FROM BLOOM'S TAXONOMY
APPENDIX B

THE SIX LEVELS OF LEARNING FROM BLOOM'S TAXONOMY

1. Knowledge: This is the lowest and weakest of all the levels. It is simply acquisition of facts. The goal of the Egyptian primary schools generally stops at this level. This brief is supported by the evaluation system. This level is weak because:
   a. memorized facts may be easily forgotten;
   b. memorized knowledge does not necessarily represent a high level of understanding;
   c. when learning stops at this level, it neglects other intellectual processes that are learned only through practice.

2. Comprehension: In this level the student understands the meaning of what he has learned so that he can explain it in his own words, give examples, and extend the information.

3. Application: In application a student can use the information learned at the two lower levels in a new situation. A child might use learning from a geography class in an independent science experiment on climate, for example. In other words, one discovers new knowledge by the application of previously learned ideas, concepts, and process to new learning situations.

4. Analysis: This level requires the student to "see" the underlying elements as parts of a whole. This more abstract level is essential as an educational objective. The ability to analyze the underlying parts of a whole is relevant to every area of learning. In comprehension the emphasis is on the grasp of meaning and intent of the material. In application it is on remembering and using the new understanding in problem situations in real life, a transfer of learning. Analysis emphasizes the breakdown of the material into all of its parts and detection of the relationship of the parts and the way they are organized.
Egyptian education, to achieve its national goals, should provide students with the curriculum that helps them develop the ability to detect logical fallacies in arguments, to have skill in distinguishing facts and ability to make decisions that are supported with logical reasoning.

5. Synthesis: At this level of learning the student is creating something new and unique. At this level there is never one correct answer. It gives the student great freedom for creativity. One could never test this with questions that require one correct answer because one's creative writing of a story, a poem, or an essay would be different from another's. Each student's ability to design a simple machine for a specific task, to design a building according to specifications, or to make mathematical discoveries would differ, and yet all the students work could be uniquely correct. It is the wide variety of creating productive thinking that education should have as its ultimate objective. The nation's problem solvers will be from students who have developed this level of learning. This level should be one of the culminating objectives of education.

6. Evaluation: In this level students are asked to make judgments. The students must be able to tell why or what considerations led them to make the judgment. This highest level uses all the learning from the previous levels. For the education of leadership, for the solution of national problems, Egyptian schools should be helping children learn through all levels of learning.
APPENDIX C

PROCESS SKILLS
APPENDIX C

PROCESS SKILLS

Process skills are those skills that one acquires in learning how to learn how to proceed from one step to a higher one. Once process skills are mastered the student can apply them to new learning situations, generally in a self-directed way. Process skills are listed below with examples of the type of questioning a teacher would use in developing these skills.

FIRST LEVEL PROCESSES

Recalling of information and stating it orally.

What do you know about __________? What does the phrase "food security" make you think of?

Observing directly or indirectly.

What did you see? Hear? Find? Read?

Defining

What does this mean? Can you define it in your own words?

Classifying

Which ones go together? In what group should this be placed? Why should it be in this group?

Interpreting - (pictures, maps, graphs, books, etc.)

What does this show? What does it mean to you? How does it make you feel?

Comparing/Contrasting

How are these alike? How are they different?

HIGHER PROCESS SKILLS

Generalizing - (from a discussion, time-line, report)

What is the main idea? What can we conclude? Can it be stated in one sentence?

Inferring - (Why it happened, next steps, causes, etc.)

What is implied? What follows from that?
Analyzing


Synthesizing

How shall we organize our reports? Programs? Exhibits?

How can we show how these events fit together?

Hypothesizing

Given these resources, what might they produce?

Predicting

Who will win this election? What will our community's population be in 1985?

Evaluating

In what ways is it good? Effective? Unjust? Who will be helped?

Hurt? Which is best for all?
APPENDIX D

WORKSHOP SCHEDULE
<table>
<thead>
<tr>
<th>SATURDAY</th>
<th>SUNDAY</th>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
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<tbody>
<tr>
<td><strong>June 23</strong></td>
<td><strong>June 24</strong></td>
<td><strong>June 25</strong></td>
<td><strong>June 26</strong></td>
<td><strong>June 27</strong></td>
<td><strong>June 28</strong></td>
<td><strong>June 29</strong></td>
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<td>OPENING</td>
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<tr>
<td>8:30 Group classes</td>
<td>8:30 Workshop Groups</td>
<td>8:30 Workshop</td>
<td>8:30 Lecture Dr. Ayoub</td>
<td>8:30 Workshop Field Trip Alexandria</td>
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<tr>
<td>9:30 Lecture &quot;Local Materials&quot;</td>
<td>10:00 Movie &quot;Future Shock&quot; Discussion</td>
<td>9:30 Lecture &quot;Producing Low-Cost Materials&quot;</td>
<td>9:30 Movie &quot;Let Them Learn&quot; Discussion with Demonstration</td>
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<tr>
<td>10:30 Group classes</td>
<td>11:00 - Workshop Groups</td>
<td>11:00 Workshop</td>
<td>10:00 Workshop</td>
<td>1:00 Staff</td>
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<tr>
<td>1:00 Staff meeting</td>
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<tr>
<td>12:00 - Group meeting</td>
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<tr>
<td>1:00 - Staff meeting</td>
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<tr>
<td><strong>June 30</strong></td>
<td><strong>July 1</strong></td>
<td><strong>July 2</strong></td>
<td><strong>July 3</strong></td>
<td><strong>July 4</strong></td>
<td><strong>July 5</strong></td>
<td><strong>July 6</strong></td>
</tr>
<tr>
<td>8:30 workshop</td>
<td>8:30 - Lecture &quot;Teacher Learner&quot; M. White</td>
<td>8:30 Lecture Dr. Stanley Applegate AID</td>
<td>8:30 Workshop</td>
<td>Final day Group Discussion of Teacher Problems &amp; Solutions</td>
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</tr>
<tr>
<td>9:30 Demonstration of AV equipment</td>
<td>9:30 Workshop</td>
<td>9:30 Tour of Cairo Museum</td>
<td>9:30 Small Large group Discussions</td>
<td>Final day Exhibit of All Work Done Visits</td>
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</tr>
<tr>
<td>10:30 Workshop</td>
<td>1:00 Staff</td>
<td>2:00 Bus tour of Cairo</td>
<td>7:00 Cairo (2:00 - 7:00 Bus Tour of Cairo)</td>
<td>Final day Group Discussion of Teacher Problems &amp; Solutions</td>
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<tr>
<td>1:00 Staff</td>
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</table>

**Final day**
- Exhibit of All Work Done
- Visits
- Presentation of Certificates
DAILY SCHEDULE - MAUDE WHITE

1. MONDAY
   June 11
   2. Preparation

2. TUESDAY
   June 12
   1. Travel to Cairo

3. WEDNESDAY
   June 13
   Travel to Cairo

4. THURSDAY
   June 14

5. FRIDAY
   June 15
   1. Meet with Guirguis Risk Assaad
   2. AID office - American Embassy

6. SATURDAY
   June 16
   1. Comptroller's office - American Embassy
   2. Preparation for workshop
   3. Preparation

7. SUNDAY
   June 17
   1. Initial meeting with staff of workshop
   2. Meeting at MOE with Ministry of Education, Dr. Hassan Ismail
   3. Preparation

8. MONDAY
   June 18
   1. Staff training for workshop
   2. Appointment with Dr. El Roby, Head of A.V. Department, American University of Cairo
   3. Preparation

9. TUESDAY
   June 19
   1. Staff training
   2. Dinner with McMillan Staff, Fred Kобрak, and Dr. Soueif
   3. Ill

10. WEDNESDAY
    1. Staff training
    2. Meeting with Dr. Halim Grais, Under Secretary for Preparatory and Secondary Education
11. THURSDAY  
   June 21  
   1. Final staff training  
   2. Preparation for workshop

12. FRIDAY  
   June 22  
   1. Preparations  
   2. Previewing films and videotapes at American Center

13. SATURDAY  
   June 23  
   1. Workshop  
   2. Staff meeting  
   3. Preparation

14. SUNDAY  
   June 24  
   1. Workshop  
   2. Staff meeting  
   3. Preparation

15. MONDAY  
   June 25  
   1. Workshop  
   2. Staff meeting  
   3. Preparation

16. TUESDAY  
   June 26  
   1. Workshop  
   2. Staff meeting  
   3. Preparation

17. WEDNESDAY  
   June 27  
   1. Workshop  
   2. Staff meeting  
   3. Preparation

18. THURSDAY  
   June 28  
   1. Workshop  
   2. To Alexandria - Field trip overnight

19. FRIDAY  
   June 29  
   1. Field trip - Tour of Graeco-Roman Museum - Marine Biology Museum  
   2. Return to Cairo

20. SATURDAY  
   June 30  
   1. Workshop  
   2. Staff meeting  
   3. Preparation
21. SUNDAY
    July 1
    1. Workshop
    2. Staff meeting
    3. Preparation

22. MONDAY
    July 2
    1. Workshop
    2. To British Council for AV materials
    3. Staff meeting
    4. Preparations

23. TUESDAY
    July 3
    1. Cairo Museum - Field Trip
    2. Tour of Cairo - Field Trip
    3. Preparations

24. WEDNESDAY
    July 4
    1. Workshop
    2. Staff meeting
    3. Meeting with Dr. Adly
    4. Preparations

25. THURSDAY
    July 5
    1. Final day of workshop
    2. Assemble materials for report

26. FRIDAY
    July 6
    1. Visit to Sakkara with members of social studies staff

27. SATURDAY
    July 7
    1. Meeting in MOE with core staff for evaluation
    2. Report writing

28. SUNDAY
    July 8
    To Fayum with members of workshop

29. MONDAY
    July 9
    Writing report

30. TUESDAY
    July 10
    Writing report

31. WEDNESDAY
    July 11
    Writing report
32. THURSDAY
   July 12
   Writing report

33. FRIDAY
    July 13
    1. Meeting with Dr. Bissett at American Embassy
    2. Reception for workshop staff

34. SATURDAY
    July 14
    Visit Coptic Museum

35. SUNDAY
    July 15
    Visit old Cairo

36. MONDAY
    July 16
    Complete report

37. TUESDAY Until Tuesday
    July 17 - July 24
    Tour of Russia

38. WEDNESDAY
    July 25
    Travel to Washington, D.C.