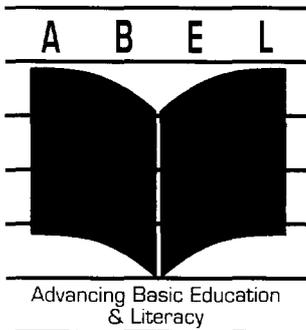
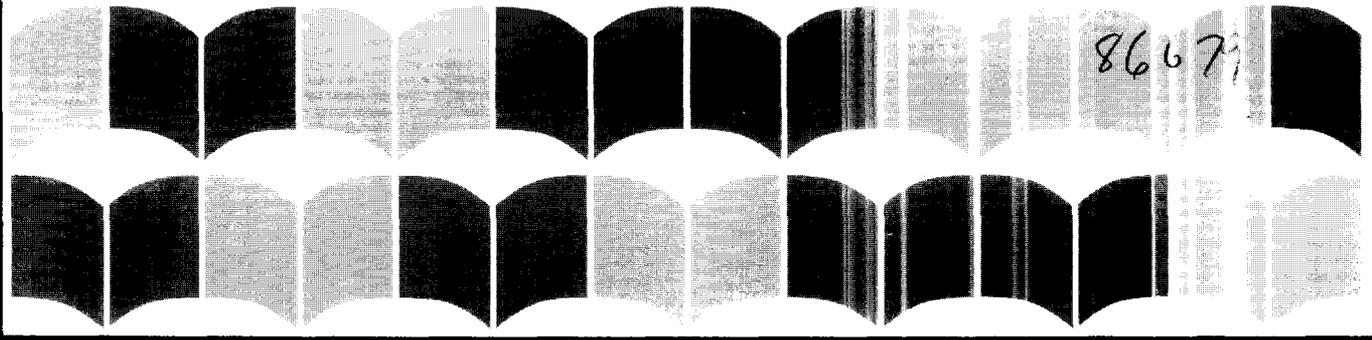


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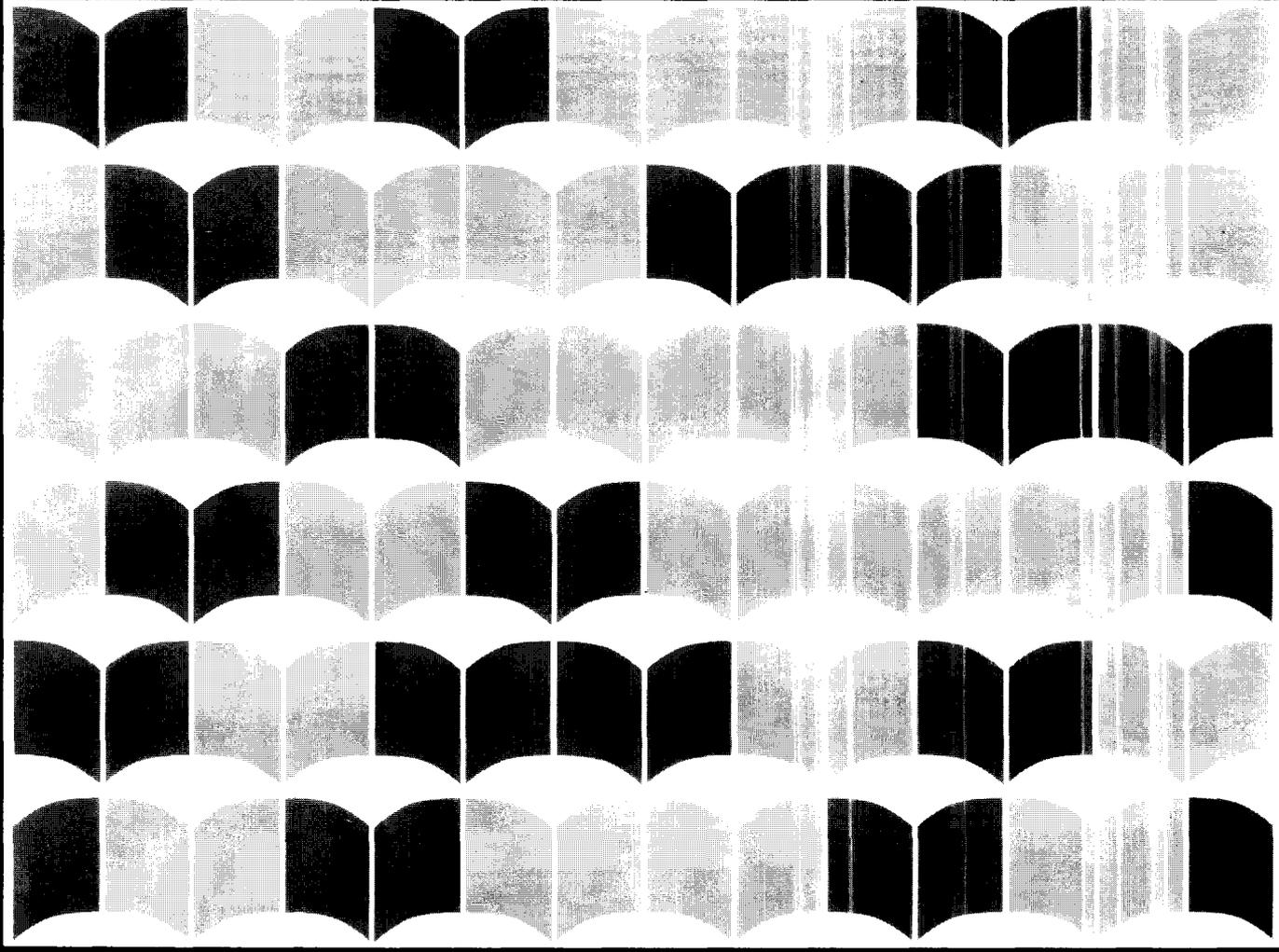
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THE ESTABLISHMENT OF A NATIONAL CENTER FOR EDUCATIONAL EVALUATION AND EXAMINATIONS

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March 1990



**THE ESTABLISHMENT OF A
NATIONAL CENTER FOR EDUCATIONAL EVALUATION AND EXAMINATIONS
Report of a Feasibility Study**

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Report of Feasibility Study

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1. INTRODUCTION

This report details the conclusions of two consultants, Mr. Protase E. Woodford, of Educational Testing Service, Princeton, NJ, U.S.A. and Mr. Peter Kimber, of the Scottish Examination Board, Edinburgh, Scotland. They visited Egypt from 10 to 23 February 1990, and again from 15 to 29 March 1990. They had discussions with a wide variety of Egyptian educationists. Details of their itinerary and meetings are included in an appendix to this report.

1.1 Statement of work

This Feasibility Study has its origins in the wishes of The Minister of Education, His Excellency Dr Fathi Serour, to improve secondary education in three ways:

- a. to use examinations as a mechanism to change teaching objectives and methods;
- b. to use the stimulus of examinations to develop in-service training for teachers;
- c. to improve university selection by improving the quality of the existing examinations.

1.2 Objectives

The team conducting the Feasibility Study was given specific objectives as follows:

- a. to assess the importance of establishing a National Center for Educational Evaluation and Examinations (NCEEE) in the light of the present assessment system in Egyptian education;
- b. to identify and prioritise the options available in development of an NCEEE, and the likely benefits of each;
- c. to assess and report on the proposal (prepared by the Executive Steering Committee) for an international project to develop an NCEEE;
- d. to determine the factors critical to success of the NCEEE and prepare a plan for development of the NCEEE which takes account of these factors;
- e. to assess the resources presently available to the developers of the NCEEE. The team will identify existing Ministry functions and facilities that could be subsumed into the NCEEE and assess the availability of suitably trained and experienced staff within the existing system;
- f. to prepare a comprehensive development plan for the NCEEE, taking into account the findings under (d) and (e) above;

- g. to identify the areas where international input would be most beneficial. The team will identify those areas where the NCEEE will require technical assistance, in the form of training, hardware and software, both in Egypt and overseas, and recommend appropriately.

The team will prepare preliminary rough estimates of the personnel, budgetary, time and other resources which would be required to implement the preferred options.

2. THE PRESENT POSITION OF THE EXAMINATION SYSTEM IN EGYPT

The main focus of the team's attention was the Thanawiya 'Amma, and the comments which follow should be understood in that context. Recommendations will be made concerning promotion examinations in a later section.

2.1 Strengths of the present system of examinations

The team had the opportunity to visit many key people in the operation of the examinations, and to discuss current procedures with them. It was particularly useful to meet Mr Oweis Ahmad Oweis, General Director for Examination Administration, and to gain some insight into the meticulous steps which are taken to ensure the confidentiality and security of the arrangements and the reliability of the marking. The team also met those responsible for the administration of the Thanawiya 'Amma in the Mansoura regional center and were greatly impressed by the scale of the operation and the care with which every detail was planned and carried out.

The conclusion of the team was that the present arrangements for conducting the marking and processing of the examination is as reliable and secure as could possibly be expected under the present constraints of resources, particularly bearing in mind the pressures of time and the growing numbers of students concerned each year.

2.2 The item-banking project

It was encouraging to know that there is an active project to develop skills of item writing among people in the upper levels of the profession. The team had a chance to meet examiners from the University of Cambridge Local Examinations Syndicates and a number of teachers involved in an item writers' course. The project should help improve the quality of items, not only in the Thanawiya 'Amma, but also in other examinations as the expertise acquired through the present in-service training center is passed on to teachers in many parts of the country.

2.3 The teachers

The team had some opportunities to meet teachers and listen to their comments on the current situation. Like teachers in every

country of the world, they were conscious of being over-worked and under-paid, but none the less there was obviously a commitment to their work, a professional interest in their subjects and a marked desire to improve their skills in assessment and other professional qualifications through in-service training.

2.4 Constraints on the present system of administration

The system was designed at a time when numbers of candidates were much smaller and before modern information technology was available. There is great scope for reforming the system

- a. to use computer technology for dating processing, and
- b. to introduce modern printing methods based on desk-top publishing if the resources can be found.

Without these innovations it is likely that the present system will be grossly overloaded, bringing delays in processing marks and issuing results. Moreover the existing printing facilities are very old and badly need to be replaced. The appearance of papers and the inclusion of better graphics could be greatly improved by the introduction of desk-top publishing and modern printing machinery.

2.5 The political need for change

The Thanawiya 'Amma is a crucial examination for all students with aspirations to higher education. There is enormous pressure on students to do well. Parents are consequently anxious about the fairness of the procedures and the speed of the processing.

In addition there is a great need to cut down on the amount of rote learning required by the present examination papers and to increase the assessment of higher educational skills such as analysis and evaluation of information, application of knowledge to new situations and problem solving.

A further kind of political pressure arises from the fact that university education in Egypt follows eleven years of education as opposed to twelve years in other countries, so there is some pressure to base university entrance on more advanced qualifications than those evaluated in the existing papers.

These pressures are given a very sharp focus by the request of the Minister of Education that there should be advanced question papers in the Thanawiya 'Amma in time for the 1991-92 diet of examinations.

3. THE JUSTIFICATION FOR ESTABLISHING THE NCEEE.

There are both political and educational reasons for establishing

the NCEEE.

- a. It is maintained, with some justice, that the current examinations rely unduly on recalled knowledge, and insufficiently on the higher abilities of application, evaluation and problem solving. Since the examinations dominate classroom practice the result is a restriction on the quality of classroom teaching which has little chance of improvement until the examinations themselves are improved. To achieve this there would need to be a massive, effort by the agencies responsible for curriculum development, in-service training and examinations, co-ordinated by the Ministry of Education. However the system is under heavy pressure at present and the necessary initiative needs to come from outside the existing structures, with new resources of personnel and materials.

The establishment of a new agency to consider and develop new types of assessment for the Thanawiya 'Amma would have a profound effect on classroom practice, an effect which could not be produced by exhortation or in-service training alone. **The examinations are the most effective way of implementing curricular change.**

- b. The introduction of objective testing and modern technology to the marking and processing of data in the Thanawiya Amma would greatly reduce the amount of marking error and increase the reliability and security of the examinations. While objective testing should not play an undue part in examinations, there is room for its introduction. Moreover the analysis of test results could yield a great deal of information about the abilities of candidates.

A priority for the NCEEE would be the development and introduction of objective tests and the machine marking of papers. The monitoring of information from examination results would provide a national overview of educational standards.

- c. The process of developing tests, including both those marked objectively and subjectively, requires the careful identification of both learning and assessment objectives. This is a task which requires considerable time, thought and expertise. The recent distribution of model question papers on a national scale has done much to make teachers aware of national standards.

However, a more fundamental task needs to be carried out. There is a need for a fundamental revision of the secondary curriculum to define clear aims and objectives for each subject and then to specify the assessment objectives for the examinations. This is a task for assessment and curriculum specialists.

The Minister of Education has decided that Advanced Level papers, based on the existing subject content but testing

higher abilities, should be introduced in the 1992 Thanawiya.

The Supreme Council for the Universities has decided that Advanced Level papers based on extended syllabuses should be introduced as soon as possible.

The implication of these two decisions is that there is an urgent need for a body with professional expertise to undertake this revision and development of assessment, in conjunction with the Curriculum Development Centre and the Ministry of Education's In-service Training structures.

- d. Discussions between teachers and the team made it evident that since senior teachers have to undertake a great deal of examining there is a continuing need for in-service training to help them undertake this task effectively. One function of the NCEEE would be to assist in this process in conjunction with the existing in-service structure.
- e. There is a need for a body with specific responsibility for carrying out long term investigations into the performance of students in order to monitor the effectiveness of changes to curriculum.

The team takes the view that some or all of these functions should be undertaken by the NCEEE.

4. FUNDAMENTAL THEMES OF THE REPORT

A number of themes, which the Team particularly wishes to emphasize, run through the Report.

- a. The need for close co-operation between the Ministry of Education, the NCERD, the In-service Training Structure and the NCEEE cannot be stressed too strongly. If the Minister's wishes for speedy reform of examinations are to be implemented, then a committee involving these bodies needs to co-ordinate the necessary action. It is sometimes said that the needs of curriculum and examinations are in conflict, but this need not be the case, especially where the national need for change is so great.
- b. It would be foolish and self-defeating for widespread changes to be introduced too quickly. The existing examination organization works efficiently and should continue until well planned alternatives are ready to operate. The role of the NCEEE should be to develop new methods and feed them into the existing structures when they are ready. For example, as new types of examination papers are developed, they should be added to or replace the existing papers. A programme for phasing in new

question papers will be shown in an appendix.

- c. Any kind of change inevitably threatens some people in the existing structures. It will be important to reassure people with a stake in the present arrangements that they are not redundant, but that there are alternative types of involvement. For example, although the introduction of objective testing would reduce the number of people required to carry out conventional marking, there will be a need for large numbers of teachers to write objective test items.
- d. The success of any educational reform depends to a great extent on informing all those concerned about the changes. The Team strongly recommends that the NCEEE should have personnel with the sole responsibility of keeping students, teachers, parents and the general public well informed about changes in advance of their implementation.

5. OPTIONS AND PRIORITIES

The Feasibility Team takes the view that a National Center is very desirable to implement the changes envisaged by the Minister of Education. We suggest that there are, broadly speaking, three models for such a center.

5.1 Option 1.

A small nucleus of measurement and evaluation specialists would provide consultative and advisory services to the agencies now responsible for the Thanawiya 'Amma and other national or governorate examinations upon request.

Advantages: This arrangement would be the most economical and the least disruptive to the current structure. Staffing would be minimal. Three or four professional staff specialising in test development, research and statistics and curriculum design, supported by 2 secretaries would be sufficient. The team would be available to the MOE to advise and assist in the development of examination papers and to provide consultation on the analysis and interpretation of examination results.

Disadvantages: Although some minor improvements in evaluation procedures could occur, it is unlikely that any major reform could take place under an NCEEE with little or no direct authority over test content, format, administration, analysis or curricular change.

Estimated first-year cost: LE 80,000 (salaries only)

5.2 Option 2.

A staff of 9 full-time professionals and 15 part-time specialists or "subject officers" with appropriate support staff would coordinate all aspects of examination design, development, production, analysis and dissemination of results of the Thanawiya 'Amma in 1991 1992 and for other examinations in subsequent years. Initially the NCEEE would use the resources and structures currently in place for such tasks as printing of examination papers, candidate registration, recruitment and training of markers, marking and data processing. The NCEEE would be responsible for overseeing all operations and for the introduction of new technology such as optical scanning of answer sheets, the use of bar codes for candidate identification and merging of scores, and desk top publishing; for the introduction of new procedures such as "A Level" papers, objective tests and item and test analyses; for the introduction of new activities such as the establishment of Sector item banks, local item writer training, workshops for test interpretation and relating test results to instructional practice.

Advantages: A new system would be "in place" immediately. Few people would be displaced by a system that initially relies on existing structures. Those with responsibility for the testing program would continue to have a stake in the process. Real change in test design, improved validity and reliability could occur without disrupting the parts of the system that work effectively now. A climate for continuous change could be created. Because change will be gradual, the various publics could be informed early and anxiety and/or opposition reduced.

Disadvantages: Because there will be a redistribution of responsibilities a perceived loss of "power" could impede implementation of reforms. There could be some duplication of tasks at the beginning.

The costs during the first year of operation of the testing program with the NCEEE will be greater than without. Economies resulting from streamlined procedures, new fee structures and the application of technology should offset a proportion of the initially increased cost.

First year costs: LE 622,000

5.3 Option 3.

A completely centralized NCEEE would be directly responsible for all testing and evaluation activities now carried out by the various agencies within the

Ministry of Education. These activities would include such operational tasks as printing and distribution of examination papers, recruitment of markers, supervision of test centers, registration of candidates, implementation of measures for test security and score reporting, among others. The NCEEE would hire, supervise and pay all temporary staff such as exam markers, examination center supervisors etc.

Advantages: Immediate and complete control over all aspects of the examination system would facilitate the introduction and implementation of examination reform. Because everyone involved in the examination system would be an "employee" of the NCEEE, obstruction should be minimal, everyone would be a stakeholder. Coordination of the various activities should be improved because the decision-making would be centralized.

Disadvantages: The very magnitude of the examination program makes it highly unlikely that complete reorganization and centralization could occur in a period of less than 3 to 4 years. It is probable that those who would be disenfranchised by the change would be less than dedicated during the transition period. A radical change in test design, content and procedures could have a very negative effect on the public. The start-up costs would be exceptionally high. Book-keeping would be a major burden.

We understand that the cost per student in the present Thanawiya Amma examination is fE 107. Assuming some 225,000 students per year, this puts the cost of the present examination at approximately fE 24,000,000.

5.4 The Team recommends the second of these models, namely a centre which would develop, produce and print examination papers and other tests and leave the administration of them to the existing excellent machinery within the Ministry of Education.

5.5 STAFFING.

We propose a Center with the following staffing with approximate salaries:

1 Executive Director:	fE	36,000 p.a.
1 Director of Finance and Admin:		24,000
1 Director of Test Development:		24,000
1 Director of Research & Analysis		24,000
1 Director of In-service Training and Dissemination:		24,000
1 Director of Operations:		24,000
6 co-ordinators at 15,000		60,000

15 Subject Specialists (part time) at 6,000 p.a.	90,000
1 Computer manager	18,000
3 Computer staff at 10,000	30,000
1 Printing manager	18,000
4 Printing staff at 6,000	24,000
6 Finance staff at 6,000	36,000
6 Executive secretaries at 7,200	43,200
14 Clerical and secretarial staff at 3,600 p.a.	50,400
Fees & committee expenses etc	20,000
Running costs, say	61,000
Total £E 606,600	

5.6 Training

We recommend training programmes for all the professional staff, and details of these proposals may be found in Appendix 7.

5.7 Committee Structure

We recommend the following committee structure within the NCEEE.

5.7.1 Supreme Council for Examinations.

The Team recommends that the policy of the NCEEE should be directed by a reconstituted Supreme Council with a broad representation of the community, including a significant number of people with financial expertise and experience since the NCEEE should move towards being a self-financing body. Moreover the Team believes that educational bodies benefit from the presence of employers whose views on the sorts of skills required of young people entering the labour market. Without underestimating the importance of the university representatives on the Supreme Council, it is important to remember that most school students do not progress to university. Since the NCEEE will be serving the whole educational community it is important that the membership of the Supreme Council should recognise this fact.

5.7.2 Finance and Management Committee

This committee would be responsible for;

- a. financial and personnel matters, including agreement of the annual budget, oversight of funding arrangements such as those mentioned in section 9;
- b. policy regarding appointments and terms of employment for staff;
- c. consideration of new areas for test development;
- d. other related matters of policy.

5.7.3 Test Development Committee.

This committee would be responsible for

- a. approving all syllabuses, test specifications and examination arrangements for individual subjects in the Thanawiya 'Amma and Advanced Level examinations
- b. directing the work of subject committees.
- c. liaising with the Curriculum Development Centre in the preparation of syllabuses and test specifications.
- d. considering information on examination performance provided by the Research Committee and, in the light of that information, making recommendations for change to subject committees, the Curriculum Development Centre and In-service Training department.

5.7.3.1 Subject Committees.

There will be 15 Subject Committees, one for each school subject, with the following membership:

- 1 senior teacher
- 1 university member
- 1 inspector
- 1 person from the Curriculum Development Centre
- 1 Subject Officer on the staff of NCEEE.
- 1 Co-ordinator for the group of subjects concerned.

The Subject Committees will be responsible for

- i. developing syllabuses and test specifications for the subject in question;

- ii. arranging for the setting of question papers in the subject;
- iii. compiling a report on the performance of students in the examinations for submission to the Examinations Committee.

5.7.4 Publicity and In-service Training Committee.

This committee would be responsible for all matters relating to the dissemination of information to the public and the profession. It would liaise with the MOE's In-service Training organization in any matters relating to assessment or the preparation of teachers for Thanawiya 'Amma and Advanced Level examinations.

It is expected that a number of training activities will fall within the purview of the NCEEE. Among these activities are:

- a. development of orientation and training materials for writers of objective test questions
- b. item writer training workshops in the sectors
- c. training of examination reviewers and assemblers
- d. training of supervisors and senior teachers in interpretation of test results and use of test results to improve instruction
- e. training markers of "free response" papers
- f. training teachers to develop classroom tests

These training activities and others will be carried out in collaboration with the agencies that currently have responsibility for them or for analogous activities.

The development of regional item banks has been discussed elsewhere in this report. In addition to item banks, the NCEEE should play a leading role in the development of local expertise in evaluation.

5.7.5 Research Committee.

This committee would oversee all NCEEE research activities, including those commissioned from outside agencies and those done in-house. All research projects would report to this committee and the research budget would be approved by it annually.

The development and introduction of Advanced Level and

Objective Test papers will take some four years to implement properly across all subjects. The NCEEE should therefore devote its attention almost exclusively to these matters during that time.

However it is also important that there should be a proper research programme as soon as resources of money and personnel are available. The research programme should

- a. be aimed solely at assessment and should not replicate the kinds of research being carried out in universities and colleges of education;
- b. concentrate on improving methods of assessment;
- c. produce statistics on examination performance;
- d. investigate the effect of changes in assessment;
- e. monitor the long-term performance of students, and other matters of national importance.

The Team believes that NCEEE should, generally speaking, commission research from other institutions.

However, the NCEEE should also conduct its own research by employing research staff on **fixed term contracts**. The Director of Research will identify areas of needed research based upon the data derived from the examinations and from other sources.

6.0 PRIORITIES

Certain developments in examinations have either been decided by the Supreme Council for the Universities, for example the revision and extension of Advanced Level courses and examinations, or have been the express wish of the Minister, such as the introduction of objective testing in the Thanawiya Amma. Other developments are the suggestion of the Feasibility Team. These developments are expressed initially as a timetable for development, followed by an expansion of the items.

TIMETABLE

1990 - 1992.

Development of Interim Advanced Level papers.

Development of Objective Test Papers and development of Item Banks in both Thanawiya

Amma and Advanced Level question papers.

Development of Desktop Publishing and Printing.

1992. First Interim Advanced Level Papers.

First Objective Test Papers.

Machine Marking of O.T. papers

Development of Revised Advanced Level curriculum and examination.

[OPTION 1: Development of data processing by computer. See Appendix 5.]

First Question Papers printed by NCEEE.

1993. [OPTION 4: Run data processing by computer in parallel with existing procedures. Appendix 5.]

Publish details of Revised Advanced Level curriculum and specimen papers.

[OPTION 5: Start development of Item Banks for Adadiya Amma. See Appendix 4.]

1995. First Revised Advanced Level examinations.

These developments are expanded in the comments which follow.

6.1 1990 - 1992. Interim Advanced Level Papers.

To meet the wishes of the Minister, there is a need for the immediate reform of Advanced Level papers, initially on an interim basis. The Interim Papers, though based on the same content as the Thanawiya Amma papers, would test higher abilities. The following programme of development attempts to identify the necessary steps towards more demanding Advanced Level papers

- a. There is an immediate need for Subject Committees to draw up a test specification for an Advanced Level paper in each subject and for Subject Committees to set the question papers. A committee structure for this development appears in Section 5.
- b. As soon as test specifications are available they must be

published to inform teachers and students for what they should prepare. This process of information would be the responsibility of the Director of In-service Training and Dissemination. Some specimen questions, if not entire specimen papers, should be circulated at the same time in order to allay anxiety. Examples of the kinds of questions which might appear in the papers are contained in Appendix 10.

- c. In addition to informing the public about the form of the examinations, the Ministry should also explain such matters as the number of A Level papers to be attempted, the way marks would be aggregated, and other related matters of public concern.
- d. It will also be necessary to explain how university selection will be determined; ie whether it will be based solely on A Level results, or on Thanawiya 'Amma results or a combination of both. There are at least two possible approaches to this matter:
 - i. At present A Level papers are a sort of "bonus", adding a possible maximum of 10 marks to a student's total for all the Thanawiya 'Amma papers. It would be possible to phase in the A Level papers by increasing annually the number of marks they contribute to the total; eg 20 marks in 1992, 40 in 1993 and so on. This would have the advantage of re-assuring parents that not a great deal will depend upon them until proper in-service training and other preparations have been made.
 - ii. Alternatively, it would be possible to say that as from 1992 onwards A Level papers would carry the full number of marks (whatever that may be) and simply base university entrance upon the total achieved. Thus if there were, say a quarter of a million places available, that number of students with the highest total would be accepted.

Both these approaches assume that the results of both the existing Thanawiya Amma and the Advanced Level papers will be aggregated. This is advisable, since the existing papers will still have a valid place in assessing basic knowledge and understanding.

- e. Although such a rapid introduction of Advanced Level papers will put pressure on the system and may cause public concern, much of this anxiety could be allayed if a number of crucial points are made clearly and simply to the public, both inside and outside schools.
 - i. All candidates in the examination will be equally affected.
 - ii. Marks on the existing Thanawiya Amma will still count,

and the A Level marks will be a bonus.

- iii. In-service training will be available to bring teachers up to date with the changes, and this will be done in such a way that no schools or groups of schools will be at an unfair advantage.
- iv. The CONTENT of the courses for Thanawiya 'Amma will not be different. The changes will be in the DEPTH of treatment in each subject, and not in the BREADTH.

If these points are clearly and forcibly made in all dealings with teachers and the public, anxiety about the relatively short time available to prepare for the changes can be allayed. There will be a very strong incentive for teachers to understand the changes and be prepared to teach towards the higher abilities.

- f. In the opinion of the Team it will be possible, but difficult, to implement these changes in Advanced Level papers by 1992 but all the steps mentioned above are a matter of urgency.

The Introduction of Objective Testing.

The Minister wishes to see the introduction of Objective Testing in and after 1992. This will be difficult, but not impossible, given the progress already made in the programme of item writers' training courses. However it is more likely that there will have to be a phased introduction across subjects as and when teams of trained item writers are available.

The Item Banking Project was originally part of the National Center for Educational Research and Development (NCERD) but is currently an independent entity. Details of the Project are contained in Appendix 4.

- a. It is recommended that the training of item writers, particularly of key people in each subject, should be a priority for the Aid Agencies. Some training abroad, either in Britain or the USA would be desirable for key people, but the major thrust should be towards training teachers in Egypt through the In-service Training structures. It would be politically wise to recruit trainees for item writing from those currently involved with marking the Thanawiya 'Amma, since there will inevitably be some reduction in the number of markers needed when O.T. is introduced.
- b. It is recommended that O.T. should be introduced to the Thanawiya 'Amma and Advanced Level papers. The following procedure is proposed for the development of item banks.

- c. A central item bank specifically dedicated to items for the Thanawiya 'Amma, both the lower level and advanced papers, be established under the direction of the NCEEE. Incorporation of the existing item banking project is an obvious first step.

A number of subject specialists have already undergone training in item writing. Steps in the implementation of the "Thanawiya 'Amma" item bank would be:

- i. NCEEE in collaboration with the Curriculum Development Centre and MOE sets test objectives. Following the setting of test objectives the test specifications for each paper are set. Responsibility for test specifications will rest with NCEEE and the Subject Committees (SCs).
- ii. In each Sector a cadre of prospective item writers would be identified by the responsible officials. At present a body of senior teachers in each subject is selected and trained by the Sector to mark the Thanawiya 'Amma papers each year. We recommend that the initial cadre of item writers be drawn from that group of senior teachers. It is expected that the magnitude of the examination marking task will be reduced with the introduction of numbers of objective test questions. Paid item writing should compensate for reduced payment for marking. Further, the very people selected for marking are the senior, experienced teachers who should be the most promising item writers.
- iii. The prospective item writers will be convened at each Sector for training as soon after the setting of test specifications as practicable. Item writer trainers from the NCEEE in collaboration with experts from the MOE and the local Sector will train the prospective item writers. Items will be written to the specifications for the Thanawiya 'Amma. Each item writer will be assigned a modest number of objective items (10?) for which he or she will be paid.
- iv. Item writers will submit newly written items to the Sector. At the Sector a panel of expert reviewers will (1) accept, (2) reject, or (3) revise each item. It is recommended that the item writers be paid for the first submission of items regardless of the disposition of the items.

Those items which are accepted by the reviewers at the Sector will be forwarded to the NCEEE for final review. It is recommended that the reviewers at the Sector should note the proportion of acceptable items from each writer. Future assignments would be given only to the best writers.

- v. A final review of each item will be given by the subject matter experts at the NCEEE. Those items that are still acceptable will be prepared for pre-testing.
- vi. There are a number of possible procedures that should be considered for pre-testing. Test security is of paramount concern for the Thanawiya 'Amma. The importance of the examination for university entrance necessitates stringent security procedures at all stages of development, production, marking and reporting. Nevertheless, we believe that pre-testing of items is essential to ensure consistent high quality in the Thanawiya 'Amma.

Procedure A: A small number of pre-test items could be "spiralled" in the operational Thanawiya 'Amma. For example, ten versions of the Thanawiya 'Amma could be prepared. Each version would be identical except for 10 pre-test items that would be unique to each version. Within each Directorate all ten versions would be administered. For each paper the examinee would only respond to a small number, ie. 10 pre-test items. The total number of items pre-tested for each subject matter would be 100.

Answer sheets would be collected at the Sector, then sent to be machine scored and analyzed at the NCEEE. The data for the pre-test items would be used for deciding to accept, reject or further revise the item. This procedure presupposes a gradual enlargement of the item bank. It is proposed elsewhere in this study that objective test items and/or sections of the Thanawiya 'Amma be introduced incrementally over time. Such a procedure would allow for development of a "rich" item bank. Procedure A has the advantage of pre-testing Thanawiya 'Amma items on the most appropriate population, the students who are actual Thanawiya 'Amma test takers. The major disadvantage to this procedure is that pre-test items will appear

in tens of thousands of test books at each operational administration of the Thanawiya 'Amma.

Procedure B: Under this procedure pre-testing would be carried out with first year university students. The acquisition, review and selection of items would be accomplished as under Procedure A. Universities would administer blocks of pre-test items embedded in their operational examinations at any time convenient to them during the first academic year. The answer sheets would be analyzed at the NCEEE. Pre-test item results would be reviewed and items suitably treated. The disadvantages of pre-testing with university students are:

the dissimilarity of the pre-test and target populations, (university students are a more able, mature sub-set of the Thanawiya Amma population);

the possible lack of motivation of the university students.

However we have been encouraged to believe that by incorporating the pre-test items in regular university departmental examinations the lack of motivation can be greatly diminished. Furthermore, given that university departments have a stake in maintaining the quality of the Thanawiya Amma it is hoped that they would cooperate in the administration of the pre-tests.

For technical reasons such as the comparability of the pre-test and target populations, the similarity of testing conditions, etc. Procedure A would be preferred. However, because of serious concern regarding the security of pre-test questions in an operational Thanawiya 'Amma we recommend implementation of Procedure B, unless the security of pre-test items in an operational Thanawiya 'Amma can be assured.

6.3 Scaling and Equating

It is recommended that procedures for equating objective test items and for putting objective tests on a common scale, through Rasch modelling or some variant of it, be

investigated prior to introduction of objective test papers or sections of papers. Common item equating, IRT pre-calibration and other possibilities should be considered.

6.4 Introduction of Desktop Publishing and Printing.

The team strongly recommends the introduction of desktop publishing and printing facilities. This matter is also referred to in para 9.2 in relation to finance. There are strong arguments for this development.

- a. The present printing presses are very old and badly need to be replaced. They are not able to accept camera-ready copy of the kind which would be produced by desktop publishing computers.
- b. Desktop publishing would make possible a great improvement in the quality and appearance of question papers, including modern graphics. Moreover the setting and composition of question papers would be done on computer with a consequent improvement in security arrangements. Both computer and printing presses would be on the NCEEE premises. Since there would be no typesetting of the present kind, the production of question papers should be much quicker.

We understand that the computer for desktop publishing is presently available.

We have also been informed that USAID supplied a printing press for a previous project, but that the machinery has never been used. It is possible that it could be renovated and put into use for the centre, but this will have to be negotiated with the Agency.

Training and preparation for the use of these facilities should start as soon as possible.

6.5 1992. First Interim Advanced Level Papers.

The Interim Papers will test higher abilities, such as problem solving, application of knowledge, analysis and synthesis, but it should be emphasised that the subject content of the papers would remain the same as for the ordinary Thanawiya Amma papers.

The Team has a considerable quantity of material illustrating suitable kinds of questions for these papers. However it would be valuable for those people being sent abroad for training to visit one or more of the testing agencies for further training in the construction of both open-ended and objective items. The aim of the NCEEE must be to train, as quickly as

possible, a group of teachers and others with a high degree of professional skill in the writing of items and the construction of tests. This will depend initially on some training overseas and/or the conduct of training courses using experts from abroad, but as soon as possible all training should be done within the country.

The marking of the Advanced Level papers will be of two kinds:

- i. objective test papers will be marked by optical mark recognition scanners at the NCEEE;
- ii. conventional papers will be marked with the Thanawiya Amma papers, but using the existing procedures as carried out by the Ministry of Education.

The later examination procedures, ie those following the marking of scripts, will apply to the Advanced papers.

6.6 Machine Marking of Objective Test Papers.

The introduction of Optical Mark Recognition machinery is an integral part of the move towards objective testing. It will greatly improve the speed, security and reliability of marking. The aid agencies are requested to give favourable consideration to the funding of this machinery. We have made preliminary enquiries about the cost of introducing modern technology for data processing and these estimates appear in Appendix 5. However we would stress the very tentative nature of these estimates since we are not experts and have merely made broad enquiries from our respective agencies. Nonetheless there is broad agreement about the cost.

6.7 Development of Revised Advanced Level.

Once the Interim Advanced Level papers have been developed, issued to the public and set for the 1992 examinations, the development of Revised Advanced Level papers should be immediately undertaken. It is understood that the Supreme Council for the Universities has already decided that this development should take place. The Subject Committees, under the supervision of the Director of Test Development and Subject Officers, will carry out this work. We have stressed in Section 4 a. that this work will require very close co-operation with

- i. the Curriculum Development Centre. We have set out a proposed committee structure which involves representatives of the Curriculum

Development Centre at several levels to ensure that courses are in line with the policies of the Centre.

- ii. Similarly much thought must be given to just how teachers can be trained to implement the sort of changes in methodology which will be required, so close co-operation will be necessary with the Ministry of Education, both for teacher training and for the preparation of suitable teaching materials.

6.8 First Papers Printed by NCEEE.

It is hoped that the NCEEE will be in a position to print the question papers in 1992 if arrangements can be made in time.

6.9 1993 [OPTION 1: See Appendix 3 Data Processing by Computer.]

If the resources can be found to purchase the necessary hardware, software and development of programmes, it is hoped that the NCEEE could be operating its own computer for processing candidate data for the 1993 procedures. However it is strongly recommended that the first year this should be run in parallel with the existing procedures to give time for computer problems to be ironed out to ensure efficient running in 1994.

Computerisation of all data processing, from candidate entry forms through to the publication of results would be a major and expensive development. We understand that costs for hardware, software and programming would be of the order of \$US 500,000. However there are several reasons why we believe this should be seriously considered.

- i. The introduction of objective papers in both the ordinary and advanced papers of the Thanawiya, in addition to the conventional papers, will mean that the quantity of data for processing will be more than doubled. This will place a severe strain on the existing procedures, with consequent delays and opportunities for error.
- ii. The use of "secret candidate numbers" to hide the identity of candidates through the marking process, could be greatly improved by the introduction of computer-generated bar codes for machine reading. This would not only lead to greater security of data, but would also

greatly speed up that part of the processing where secret numbers are allocated and applied to question papers.

- iii. Once data is computer-processed, it is much easier to extract statistical information about candidates and schools.

6.10 Publication of Revised Advanced Level Arrangements.

Subject Committees should aim to publish the Revised curricula/syllabuses and specimen papers for the new examinations in good time to allow In-service Training of teachers in preparation for the introduction of the new examinations in 1995. This will require a considerable effort on the part of the whole educational system to introduce the different teaching approaches required. A proposed committee structure is outlined in Section 6.

6.11 1994 Teaching for Revised Advanced Level Begins.

Distribution of revised syllabuses and specimen examination papers in 1993 will enable teachers to begin teaching towards the Revised Advanced Level papers in academic year 1994 - 1995. It is assumed that there will be close co-operation with the In-service Training personnel in the Ministry of Education to prepare teachers adequately.

The Team considers that the timetable proposed for these developments is necessary in the light of the Minister's wishes and the present needs of the examination system. The timescale is possible if the necessary time and energy can be given by the staff of the Centre and if there is cooperation from other parts of the educational service. However there are many further developments which could usefully be undertaken by the Center once it is established and some are listed below.

6.12 OPTION 5: Item Banks for the Adadiya 'Amma

At present the Governorates prepare the Adadiya' Amma examination based upon specifications received from Cairo. It is understandable that the Governorates would want to maintain control over the proportion of local students passing or failing the Adadiya' Amma. We see three alternatives for the Adadiya Amma:

- a. That the Adadiya Amma be developed by the NCEEE using items from a central item bank or from the Sector banks. Cut-off

scores could be developed by NCEEE or the Governorates.

- b. The Adadiya Amma be developed by the Sectors using items from the Sector banks. Cut-off scores could be determined by each Governorate.
- c. The Adadiya Amma could be developed by the Governorates, as now, using items from the Sector item banks. Cut-off scores could also be set by the Governorates.

Advantages/disadvantages:

Alternative a. If the NCEEE is to be the central examining body for the nation, then responsibility for the Adadiya Amma is reasonable. A disadvantage is that a centrally developed and marked Adadiya Amma may not be sensitive to the regional variations in preparation and performance of students in Egypt and thus disadvantage examinees in certain geographical areas.

Alternative b. An Adadiya Amma developed at the Sector level from materials in local item banks would probably be more sensitive to local conditions than an examination developed centrally. At the Sector level it is likely too, that more talent for test development and review will be available than at the Governorate level. Cut-off scores developed by each Governorate would retain a degree of local control. A disadvantage is that there is currently no structure in place nor experience in test development at the Sectors as there is at the Governorates.

Alternative c. The Governorates are accustomed to developing the Adadiya Amma locally with specifications from Cairo. Procedure c. also ensures the greatest degree of local control over the examination. A disadvantage is that local development draws upon the most limited technical and professional resources available.

6.13 Centre Level Item Banks

Currently the Adadiya Amma, the examination for middle school leaving, is developed and administered by the Governorates. Promotion examinations are developed by either the Governorates or the local school districts. It is recommended that item banks at the Sector level be established. Because item writer training, item review and revision, payment of item writers will be carried out at the Sectors for the Thanawiya 'Amma, there will be in place a structure that will serve as the foundation for establishment of Sector item banks. It is recommended that test specifications continue to be developed centrally, in future by the NCEEE with appropriate consultation with the various stakeholders. The Sectors

with technical assistance from the NCEEE, could develop banks of items for the Adadiya Amma using procedures analogous to those for the Thanawiya 'Amma. Promotion and mid-year examinations, whether developed by the Governorates or by local school districts, could also draw from the Sector item banks.

6.14 OPTION 3 Long-term projects.

There is a clear need for a long-term reform of the curriculum and the examination system in the light of changes in society, particularly the growth of the school population and the need for more technically qualified young people. The most favoured career choices for the most able young people lie in the fields of law and medicine, a pattern which is familiar in other countries. However there will be an increasing need for people who are competent in modern technology.

The Team suggests that the NCEEE is the logical body to give fundamental thought to a number of long-term issues, such as the following.

a. Promotion Examinations.

It is suggested that the use of promotion examinations from one year to the next might be re-considered. In a system where almost all pupils are promoted, it is worth asking whether there is anything to be gained by holding promotion examinations. Teachers argue that they have a motivating effect on pupils, but against that it could be said that the time spent in preparing examinations is not the best use of a senior teacher's time.

If there really is a need for annual examinations, then the NCEEE could provide a useful service by training local groups of teachers to develop item banks of O.T. or other types of test instruments.

b. A School-leaving Certificate for ALL Students.

The Team recommends that the NCEEE should also consider whether there is a need for a school leaving certificate. The arguments for introducing one include the following points.

- i. The Thanawiya 'Amma is the goal for some 30% of school pupils, of whom about half gain entry to tertiary education. To put the converse of this position, some 85% of pupils leave school with no clear evidence of what they have attained during eleven years of education at public expense. There seems a strong argument, therefore, for some kind of certificate attesting what a student has

achieved. Such a certificate would offer students a tangible goal which would do a great deal for personal motivation. This is not the place to discuss the details of how such a system might work, but simply to note that this is a long-term project to which the NCEEE should devote consideration.

- ii. The lack of a school-leaving certificate carries the message that the only worthwhile goal of education is university or college entrance, and that anything less means that education was largely worthless. Although few students or parents would express this view in such stark terms, there is a clear implication in this direction. A good, descriptive certificate might do a great deal to improve the status of the technical and other branches of the education service.

c. A national assessment

In order to carry out educational reform it is essential that periodic, reliable data on the performance of students be available to decision makers. It is recommended that the NCEEE be made responsible for the conduct of periodic assessments of specified age groups of students in specific subject matters. Procedures exist for obtaining small, yet extremely representative samples of students, and for sampling broad areas of subject matter with relatively brief exercises. It is recommended that governance of the Assessment be assigned to a representative group of "stakeholders", representatives of the academic, business and government communities, parents and teachers. Results of each assessment should be widely disseminated to and debated by all publics. The results of the Assessments should be used in in-service training programs and with curriculum developers to inform curricula and effect improvements in instructional practice.

7. THE CO-ORDINATION OF EDUCATIONAL STRUCTURES.

All that has been said above indicates that changes in assessment must be closely co-ordinated with other branches of the educational service, and it is strongly recommended that a senior committee should be established including among its members the Directors of the NCEEE, NCERD, In-service Training and the Senior Under-Secretary in the Ministry, and that the Minister should chair meetings. Co-ordination at this level is essential to push the reforms through in the limited time available.

In the longer term, however, it is important for this

committee to continue so that there is the right kind of co-ordination. The Team believes that it is important for the agencies responsible for curriculum, assessment and in-service training to be autonomous, but it is equally important for these bodies to respect each other and to co-operate closely.

8. FINANCE

Funding from aid agencies will be necessary on a generous level to establish the NCEEE. The following substantial needs can be identified at this stage.

8.1

Accommodation

The Team would stress the need for a good working environment. Many educational buildings are drab and unattractive, with a consequent effect on the self-worth of employees. It is important that the NCEEE should begin with working conditions which are at least on a par with the NCERD.

It is not easy for the Team, in the short time available and with limited knowledge of local conditions, but the following estimate of accommodation costs indicates the basis of calculation, and allowance can then be made for variations at a later stage.

Assumptions:

Interim Advanced Level in 1992 and Revised in 1995
Introduction of Objective Testing in 1992
Introduction of Desktop Publishing and Printing in 1992
Introduction of Data Processing in 1993
Item Banking for Adadiya' Amma in and after 1993

Full time Staff: Exec. Director and 5 other Directors
Computer manager
Printing manager.
3 computing staff
4 printing staff
6 finance staff
20 clerical and secretarial
6 Subject Area Coordinators

Part-time: 14 Subject Specialists.
3 Research staff

TOTAL STAFF.62

Space allowance: 40 sq. metres for Exec Director
30 x 5 for other Directors
20 x 14 for Subject Officers

20 x 6 for Subject Coordinators
20 x 2 for print and computer managers
10 x 30 for other staff

50 x 4 for meeting rooms

75 x 2 for computing and printing.

200 storage for question papers & stores

TOTAL AREA 1480 sq metres

COST to rent at US\$ 150 per sq metre = \$222,000 (outer Cairo)

COST to rent at US\$ 325 per sq metre = \$481,000 (inner Cairo)

COST to build at E£ 1500 per sq metre = £E 2,220,000

There would be additional costs for furniture and equipment which are hard to estimate at this stage.

8.2 Printing Press and Desk-top Publishing

The existing printing presses are just that - existing. They are seriously out of date, but more significantly, they are unable to operate in conjunction with modern desk-top publishing computers. Consequently the presentation of question papers and the quality of illustrations are very unattractive. The image of the NCEEE would be greatly improved if the question papers it produces are visually better than the old ones.

In addition, it is intended that all examination stationery, including multiple choice answer forms and machine readable entry forms, will be printed by the NCEEE presses. A modern printing process will make this work much more efficient.

The Team understands that a printing press supplied by USAID some years ago is unused and might be made operational for this project, failing which the aid agencies are asked to give serious consideration to providing a suitable printing press for this purpose.

8.4 Candidate Data Processing Computer

At a later stage, 1992 - 93 it is recommended that the NCEEE should undertake all data processing for the Thanawiya 'Amma. This will require a greater computer

capacity and it is suggested that a further specialist should be asked to prepare a report in due course, but in very broad terms, and basing estimates on a British examination Board at 1990 prices, the lower limit of setting up a mainframe system would be about UK£ 350,000 (say \$ 500,000) plus programming costs.

We recommend that the aid agencies should give consideration to providing the necessary hardware and training for this innovation.

8.5 Staffing

We have made proposals for staff with approximate salaries totalling some LE 530,000. (See section 5.5 above) with a further LE 80,000 for running expenses. Proposals for funding this expenditure are found below.

9.0 POSSIBLE SOURCES OF INCOME FOR NCEEE.

The Team has considered a number of ways of funding the NCEEE and these are found in Appendix ?????. However we would suggest certain basic principles that should apply.

- a. The Center should be autonomous, with its own sources of income, and with freedom to determine its own conditions of employment and salary structure for staff.
- b. The fees for Advanced Level papers would be the basic source of income for the Center.
- c. We suggest that the relationship of the Center to the MOE should be that of a **contracting agency supplying services**. The MOE would also supply services to the Center, and financial arrangements should be negotiated periodically, and possibly annually.

9.1 FEES

We consider that fees of about LE 25 should be charged for students to take two Advanced Level subjects, and we are advised that this should be politically acceptable, on the grounds that the Advanced papers are voluntary. We recommend that these fees should be given to the Center and that the Center should have the liberty to **reconsider fee levels in the light of its budgetary needs**. We realise that this is a controversial proposal, but there are strong reasons for recommending it. Without this funding the Center would run the risk of being starved for funds to carry out its function properly.

9.2 Sponsorship.

We would encourage the Center not to be totally dependent on fee income. It is possible that industrial bodies may be willing to sponsor some aspect of the Center's work, as happen in Turkey and other countries, and these sources should be investigated. This is perhaps most likely to happen while the Center is being established.

9.3 Test Development

The NCEEE will be a testing agency, and as such should seek opportunities to develop test other than those for schools. For example, there is no reason why the Center should not develop licensing and certification tests for such activities as

- hotel management
- travel agents
- computer technicians
- medical technologists
- electricians.

Fee revenue from such activites could subsidise the operational costs of the NCEEE. We realise that this

9.4 Testing Agencies

The NCEEE could act as agent for other testing agencies. For example, the British Council currently administers EFL tests, and it is understood that they would welcome the opportunity to pass this responsibility to NCEEE. Similarly the NCEEE could negotiate with other agencies such as ETS in the USA. The centre could offer such services as

- printing and distributing bulletins and information
- candidate registration
- test center management
- scanning and scoring examinations
- score reporting.

The income from such services would subsidise the operational costs of the NCEEE.

9.5 Cost Recovery

The present cost of a candidate in the Thanawiya 'Amma is about £E 105 towards which each candidate contributes £E 7. It is suggested that fees should be charged for entry to Advanced Level papers, and that these should increase annually to about £E 25 as the external funding is decreased. This would yield an annual income of about £E 5 million

It is probable that an A Level fee of about a quarter of the

Thanawiya 'Amma fee would be sufficient to cover the additional cost of the A Level papers, bearing in mind that the additional costs arise only from setting, printing and marking the papers and not from other aspects of the administration. Taking into account the expected saving from Objective Test papers, the proposed A Level fees should be sufficient. However, it is difficult to be more precise without access to detailed figures on the present costs.

9.6 Outside printing work

If the recommendation for new printing presses is accepted (see 8.2 above) then the NCEEE could undertake whatever amount of commercial printing it can cope with.

10. RECOMMENDATIONS.

The following list summarises the recommendations of the report.

10.1 Staffing continuity

During the development of the feasibility study a representative of the British Council and a representative of U.S. Agency for International Development worked regularly with the feasibility study team. The two representatives were an invaluable resource. They had worked in the development of the feasibility study proposal, they understood local conditions, they knew all the key personnel and had access to the Minister of Education and the decision makers at all the relevant agencies. It is strongly recommended that they be integrated into the implementation of the project and that their talents and expertise be available to the NCEEE staff especially during the start-up period of the center to liaise among the agencies.

- 2 d. There should be personnel in the NCEEE responsible for informing the public and the teaching profession about all matters concerning the development of courses and examinations.

The training of item writers should be a key part of the development of the NCEEE and aid agencies are asked to give sympathetic consideration to this.

Objective testing papers should be introduced into the ordinary and advanced level papers of the Thanawiya. The proportion of marks given to objective and subjectively marked papers should be decided by subject committees.

The initial cadre of item writers should be drawn from those senior teachers who have already undergone a period of training in item writing.

Item writers in the initial stages of constructing bank of items should be paid for a specified number of items to be submitted, regardless of their quality. Future item writers would be selected from those chosen on the basis of these initial items.

Pre-testing for the objective papers in the ordinary and advanced level Thnawiya papers should be carried out on first year university students.

Procedures for equating objective items on a common scale should be considered.

The introduction of desktop publishing linked to a modern printing press should be considered.

If a mainframe computer capable of processing all candidate examination data is introduced, the processing of results should run in parallel with the conventional processing for at least the first year.

Item banks for use in the Adadiya examinations should be developed at the sector level, using the structure to be developed for the Thanawiya.

Test specifications for the Adadiya should be developed centrally, with the results being analysed by the governorates for their own purposes.

In the longer term the NCEEE should give consideration to the need for promotion examinations and should advise the Minister accordingly.

The NCEEE should consider carrying out periodic investigations into the performance of groups of students in specified areas of the curriculum.

A senior education committee should be set up to coordinate the overlapping work of curriculum development, in-service training, assessment and the ministry of education.

A committee structure within the NCEEE would include

- A Supreme Council
- A Finance and Management Committee
- A Test Development Committee
- 15 Subject Committees
- A Publicity and In-service Training Committee
- A Research Committee

The NCEEE should have a computer to carry out all data processing for examinations, but this is not a priority.

Until the NCEEE is self-financing, start-up funds should be sought from aid agencies.

All objective test papers in both the ordinary and advanced level examinations should be machine marked in the NCEEE.

The senior staff of the NCEEE should include the following:

- Executive Director
- A Director of Test Development
- A Director of Research and Analysis
- A Director of Operations
- A Director of Finance and Administration
- A Director of Training and Dissemination

Training requirements for senior staff are outlined in the body of the report.

The NCEEE should assume responsibility for constructing all examination papers for the ordinary and Advanced levels of the Thanawiya Amma as soon as possible.

APPENDIX I.

Organisation Chart for the National Center for Educational Evaluation and Examinations

APPENDIX II.

Organisation charts for the Introduction of Advanced Level Papers in 1991 - 92.
Introduction of Objective Testing and Data Processing.

APPENDIX III.

Test Development of Thanawiya Amma.

The following is an outline of a sequence of events for test development in one subject, e.g. Science:

- a. The Supreme Council of the NCEEE will set broad aims and objectives for the Thanawiya 'Amma.

The general test aims and objectives are presented to the Subject Committee. (For membership see para 5.7.3.1). Together with the NCEEE Director of Test Development the Science Committee will develop a set of test specifications for both the basic and advanced sections of the Thanawiya 'Amma. The Committee will also

develop prototype examination questions for each specification at each level.

- c. The NCEEE Director of Training and Dissemination and the TD Director will arrange for item-writer training sessions (2-3 days) in the governorates. (Prospective item writers will have been identified and recruited in the Governorates) Training will be carried out by subject specialists who are also skilled at item writing. Items will be written to Thanawiya 'Amma specifications.
- d. Following training, the item writers will submit a set of items to the Directorate for review. (See under Item Banks)
- e. The interests of the Curriculum Development Centre will be protected by the presence on each Subject Committee of a CD representative.
- f. As soon as practicable, a sample examination, drawn to the new specifications, should be assembled, reviewed, widely disseminated and discussed with all interested parties. This activity will be under the direction of the Director of Training and Dissemination.
- g. Approved item writers will continue to submit items for review and banking through the Governorates. Numbers of items will be determined by the TD Director at NCEEE.
- h. Test assembly and review will be carried out for the two parts of the Thanawiya 'Amma science examination by 3 science specialists under the direction of the TD Director. The specialist team will divide assembly and review tasks.
- i. Production and printing. The Operations Director at NCEEE will supervise production and review of camera ready copy. It is expected that printing will be carried out initially at Dar el Salam. It is hoped that in the near future, using desk top publishing equipment, camera ready copy of each paper can be produced and printed at the NCEEE.
- j. Candidate registration, test center management, free-response marking etc. will be done as now in cooperation between the administration in the MOE and the Director of Operations in the NCEEE. The Centre will supply all question papers and marking instructions. Grading or marking of the "subjective" sections of the two papers of the Thanawiya 'Amma will take place as now in each sector. The answer sheets for the objective test papers or sections will be scored by the NCEEE. Objective and subjective paper results will be fed into the existing procedures for marks processing. (See Appendix 2). A "pass/fail" grade or "cut-off" mark will be determined for the Thanawiya 'Amma basic paper. Results for the Thanawiya 'Amma advanced paper will be reported by rank order of examinees.

[When full data processing facilities are in operation, bar-codes will be used to match the various papers for each candidate]

- k. Score reporting will be the responsibility of the Director of Operations.
- l. Scores will be made available upon completion of processing to the Supreme Council of Universities for determination of admissions policies to the universities. This process will be unchanged from the present system.
- m. As soon as practicable, subsequent to marking, the Director of Research and Analysis will present examination results and sample papers to the Supreme Council and to Panels of experts, ie science teachers and professors, scientists in the private sector for review and comment. The purpose of these reviews is to identify the degree to which students demonstrate the ability to meet the test objectives, to identify areas of strength and weakness, to make recommendations regarding curricular change and to suggest areas of investigation and research. Staff from NCERD, MOE, and the Governorates will be invited. The Director of Training and Dissemination will be responsible for these activities.
- n. Meetings will be held with science supervisors and senior teachers at the Governorates to distribute and discuss test results and to provide recommendations for instructional practices. Science specialists from NCEEE together with the Director of Research and Analysis or designate, with the collaboration of senior staff of the Governorates, will conduct the meetings.
- o. Proposals for research projects suggested by the analysis of test results will be prepared under the leadership of the Director of Research and Analysis and contracted to appropriate research groups, ie NCERD, the universities.

The procedures described above would be typical of the development process for the Thanawiya 'Amma once it has become operational within the framework of the NCEEE. By the third year of operation of the Thanawiya 'Amma within the NCEEE it is expected that a significant proportion of the examination, especially of the basic or lower level paper, will be of an objective test format. In order for a supply of high quality objective test items to be available, intensive item writer training, item writing and banking will have to take place during the first two years of the NCEEE. We propose a gradual introduction of objective test sections into the Thanawiya 'Amma. Progress in developing item banks will determine when objective testing can be introduced in each subject. It is not expected that the Thanawiya 'Amma, basic or advanced papers, will be exclusively objective in format.

APPENDIX IV.

The Item Banking Project.

The governance of the Item Banking Project is at present vested in an Executive Steering Committee. Job descriptions for Examination Specialists, Item Bank Operators and teams of key item writers have been prepared.

The University of Cambridge Local Examinations Syndicate issued a "Report on the Computerization of Examination Processing - EGYPT" in December, 1989. The report deals with item banking as part of the larger issue of computerization of the entire examination process for Egypt. The report touches upon concerns such as the appropriateness of objective test questions and the difficulties to be encountered with regard to pre-testing. The report provides detailed information on the timing of various activities in connection with the item bank, technical data on software and hardware and costs.

During the first visit of the feasibility study team in February, 1990, the second Item-writer training course took place. A team of trainers from Cambridge, one each in Mathematics, Science, Social Studies and Modern Languages worked with local resource persons and groups of prospective item writers in an intensive training activity. The training was scheduled for a two week period. It is expected that some of the output from the item writer training will be available for tryout for the item bank. As of this writing there are no items available.

Dr. Carroll is responsible for local training of the item banking project team. It is proposed that further training be given to four of the team members in the UCLES Examination Administrators' course in June, 1990. Training is also planned for item bank operators in Cambridge, summer, 1990.

It is assumed that the Item Banking Project eventually will be subsumed into the NCEEE. The stated objectives of the Item Banking Project were:

- i. To train item writers in all subjects in the writing of examination questions, both subjectively and objectively scored; and especially questions that test higher order skills.
- ii. As a precondition for long-term development and improvement of the Thanawiya 'Amma examinations,

to:

- A. set up a storage and retrieval system for examination questions that would substantially increase the allowable size of the pool of question writers, without endangering security.
 - B. devise and implement formal moderation procedures that would subject possible examination questions to stringent scrutiny and careful revision.
- iii. To set up a system for storing and retrieving test items of proven good quality, that have been used in examinations in one part of the country, so as to enable them to be passed to other regions where they have not been used.
- iv. To provide training in examination administration for Subject Officers and Researchers, with the aim of assisting the development of a cadre of specialists who can contribute to the long-term development of Egyptian examinations.

APPENDIX V.

Development of Data Processing by Computer.

The Team regards this development as optional but logical. At present data processing, from the submission of candidate entry forms, to the entry and processing of marks, and the publication of results, is done by a combination of manual and computer procedures. Computers are used only for the final summation and checking of candidate scores.

It would be more sensible for the NCEEE eventually to undertake all data processing, while leaving the organisation of marking to the present efficient organisation in the sectors. This will require mainframe computer facilities or a network of personal computers with appropriate staffing but the Team is not competent to make specific recommendations. It is suggested that if this option is pursued a specialist consultant should be asked to produce a report. Very superficial enquiries from our parent organisations suggest that the costs would be between £E 850,000 [£UK 200,000, \$ 330,000] for a PC network system with a slow printer, and £E 2,000,000 [£UK 500,000, \$ 825,000] for a mainframe system with a high speed printer.

In the opinion of the team this is a desirable development to increase the speed and reliability of the

data processing of the examinations. Once such a system is established there are many benefits in terms of producing examination statistics and analyses, but it is appreciated that this is a major investment.

Merging examination papers.

One aspect of computerised data processing which would greatly improve the speed of processing would be the introduction of bar coding to merge the marks of individual students from different examination papers.

For example, it a student may take as many as four different papers in each subject; an objective test paper at ordinary and advanced level, and a free-response paper at each level.

It will be crucial for the various papers for each examinee to be merged. We recommend that all objective test papers be scanned in Cairo under the supervision of the NCEEE. All "free response" papers will be marked, as at present, in the sectors by trained markers. The following procedure is recommended for "merging" the results of each paper for each examinee **once the NCEEE has full data processing facilities.**

When students arrive at the testing site they will be given a set of adhesive Examinee Labels, each containing a unique bar coded Examinee Number. The examinees are instructed to place one of these labels on each examination paper and on the register next to their name. After local marking of the "free response" papers the ratings or marks are entered electronically by means of a bar code reader and a marking card by each marker. The marks for the "free response" papers are sent electronically to NCEEE, the actual papers remain in the sectors under secure conditions pending any necessary re-marking etc. Eventually they are destroyed. The objective test papers are physically sent to NCEEE for optical scanning and grading. NCEEE merges the marks on all papers for each examinee. Below is a sample of the Examinee Labels.

An alternative approach to the merging of marks for the Thanawiya 'Amma papers would be to provide test booklets with pre-coded examinee identification numbers in an optical field. Additional fields would be provided for the marker's i.d. number and the mark or grade given. All optical fields would appear on the cover page only. All cover pages and objective test answer sheets would be processed by the NCEEE and all marks merged by the NCEEE.

[labels here]

We recommend that the practicability and cost of these procedures be investigated as part of a feasibility study for full data processing.

APPENDIX VI.

We recommend the following qualifications for professional staff of the NCEEE.

PROFESSIONAL STAFF

It is recommended that the NCEEE begin operation with a management team of six people:

An Executive Director

A Director of Test Development

A Director of Research and Analysis

A Director of Operations

A Director of Training and Dissemination

A Director of Finance and Administration

Executive Director

This person will have the administrative responsibility for achieving the goals of the NCEEE, as well as day-to-day responsibility for planning, guiding and monitoring the various tasks of the NCEEE. She/he will hold regular meetings with NCEEE professional staff and such other groups or individuals as necessary, will review and approve all plans, instruments, administrative procedures, reports, and presentations, giving special attention to assuring quality in all activities of the NCEEE. In addition, the executive director will communicate directly with the Minister of Education, the Executive Steering Committee, the Supreme Council of Universities, and many of the individuals and groups, national and international, interested in the NCEEE.

The complex needs of the NCEEE demand an individual with excellent communication skills and the highest levels of technical and managerial expertise.

Director of Test Development

This person will be responsible for the planning, design, development, production and quality control of all examination material developed by or for the NCEEE. In

addition she/he will provide such technical assistance as needed to researchers and will be responsible for special reports as required.

Duties

Among the specific duties of the Director of Test Development are:

- a. To coordinate and/or direct the work of assigned subject matter specialists and others in the setting of objectives, specifications, item and examination development.
- b. To plan with the Directors of Research and Analysis and Operations the development of statistical analyses and systems requirements for the examination development process.
- c. To establish schedules associated with the examination development process to meet production deadlines.
- d. To collaborate with the Director of Training and Dissemination and others as appropriate in the preparation of examination-related publications such as sample examinations, marking guides and marking scoring procedures.
- e. To provide leadership to professional and technical staff in the development and interpretation of NCEEE, MOE and Higher Education policies and procedures for examination development.
- f. To organize and participate in the meetings of the subject matter specialists.
- g. To represent the NCEEE at national and international professional meetings.
- h. To review, evaluate and consult with staff on tests and interpretive materials.
- i. To prepare and/or oversee and approve test development budgets and related documents.

Minimum Requirements

A Master's degree plus additional graduate coursework or an equivalent combination of education and experience relating to educational measurement, experience in elementary, secondary and university education , and demonstrated management skills.

Five years of experience providing evidence of knowledge in administration, financial management, educational measurement,

and research; including at least three years of administrative and professional leadership experience is necessary.

Director of Research and Analysis

This person will serve as NCEEE expert in testing and measurement, provide technical leadership in addressing issues related to the statistical analysis, use, and interpretation of test results. Responsible for planning, directing, and managing complex statistical activities for NCEEE testing programs or projects. Conceptualize, conduct, and manage large-scale or complex program-related research and development activities. Serve as manager for all Statistical Analysis activities. Assign and monitor research activities contracted to other agencies.

Duties

Specific responsibilities of the Director of Research and Analysis will be:

- a. To propose, design, and direct complex research programs and projects involving the coordination of tasks and staff.
- b. To coordinate research programs with NCEEE priorities and with the collaboration of the agencies and individuals as needed.
- c. To provide leadership in the development of proposals for complex and integrated programs of research development and services.
- d. To plan and formulate policies and assess implications of research programs and projects.
- e. To serve as a senior psychometric advisor on measurement issues, policies, and procedures to the NCEEE; participate in determining measurement policies and priorities that have broad organizational implications; serve on policy and planning committees.
- f. To actively seek out new psychometric and statistical developments related to the statistical analysis work for NCEEE testing programs and projects; initiate appropriate research and development activity to facilitate the application of new psychometric and statistical procedures.
- g. To plan and establish goals and objectives for the statistical analysis activities of the NCEEE; conceptualize, direct, and manage the statistical/measurement activities performed for providing both managerial and professional leadership.

- h. To design, conduct, and manage large-scale or complex measurement studies, functioning as an expert on major facets of the studies. Provide leadership in the development of proposals for programs of research and development to meet the needs of NCEEE testing programs.
- i. To plan, organize, direct, coordinate, and control the statistical analysis activities of the NCEEE. Establish schedules and assignments, monitor workflow, develop budgets, and carry out responsibility for personnel actions.
- j. Initiate, define and maintain technically sound and appropriate operating procedures, both standard and nonstandard, particularly those involving quality control and documentation; ensure that these procedures are applied in accordance with established standards of accuracy and timeliness.
- k. Make professional contributions through articles, speeches, seminars, and participation in professional organizations.

Minimum Requirements

A doctoral degree in Educational or Psychological Measurement or an equivalent combination of education and experience from which comparable knowledge and abilities have been acquired is necessary.

Four years of progressively responsible experience, including administrative experience, providing evidence of continuing and substantial involvement in educational measurement activities in the professional community are necessary.

This person must demonstrate through knowledge of educational measurement theory and practice in order to provide expert advice to the NCEEE, to serve in a leadership capacity, and to represent NCEEE in professional organizations and the educational community.

Extensive knowledge of the applied psychometric methods used in accomplishing the statistical analysis activities of NCEEE testing programs or projects.

Ability to communicate effectively orally and in writing in order to prepare statistical and research reports and planning documents, to consult with internal and external groups and to meet with the press and public.

Well-developed analytical and problem-solving skills in order to identify and anticipate measurement-related problems and to plan, design and direct research and development projects.

Extensive knowledge of research methods and data analysis techniques and resources sufficient to design and conduct major research and development studies.

Knowledge sufficient to oversee development of budgets to monitor and approve expenditures against budgets.

Extensive knowledge of a specific discipline in order to evaluate design, management, and direction of complex research programs and to conduct research and provide professional leadership.

Director of Training and Dissemination

This person will plan and direct the communication activities of the NCEEE with the educational and government communities, business and industrial groups, the press and other media and the general public. She/he will stimulate the use of the results of NCEEE examination results for research and educational change in Egypt.

It will be the responsibility of the Director of Training and Dissemination to organize and carry out training activities in collaboration with the NCERD, the MOE the Directorates and Governorates. Among the training activities will be item writer training, workshops for teachers and supervisors, training markers.

Duties

Among the specific duties of the Director of Training and Dissemination will be:

- a. To develop, direct, and maintain an active program of dissemination and utilization of NCEEE examination results to a wide variety of publics employing many media approaches, timed to maximize their effects
- b. To plan and implement training and technical assistance programs with the other NCEEE Directors, staff of the NCERD, the MOE, Governorates and Directorates as appropriate
- c. To maintain continuing contacts with educational, business and government leaders on behalf of the NCEEE
- d. To research and analyze the feasibility of new activities for the NCEEE in collaboration with the other NCEEE Directors
- e. To organize and establish annual budgets and strategic plans, to prepare and present plans for approval, to monitor progress toward achievement of program goals, to evaluate efficiency and utilization of resources

- f. To develop, prepare, negotiate and administer media contacts to ensure the most effective dissemination of information, to arrange for public interviews, workshops, etc.
- g. To maintain constant and close relationships with all agencies and individuals with a stake in the NCEEE and its examinations, NCERD, MOE, Universities, Governorates, Directorates
- h. To represent the NCEEE in forums with educators, governmental agencies, and the general public. To represent the NCEEE at professional meetings.

Minimum Requirements

A master's degree plus additional study or an equivalent combination of education and experience especially with respect to journalism, media experience, writing and management activities, and experience in organizing small and large group seminars and workshops.

Five years experience providing evidence of administrative and financial management in the area of mass media and public relations; including at least three years of administrative and professional leadership experience.

Director of Operations

This person will have responsibility for all operations of the NCEEE.

Duties:

The specific responsibilities of the Director of Operations will include:

- a. data processing and computer operations for item banking
- b. candidate registration
- c. optical scanning
- d. recording of examination marks
- e. score reporting
- f. statistical analyses and summaries (a computer specialist should be assigned to the director on a full or part-time basis)
- g. production and printing of bulletins, brochures production and printing of test books

- h. preparation of capital budgets
- i. purchasing

Minimum requirements

The Director of Operations must have demonstrated ability to work collaboratively with a variety of agencies and entities toward the accomplishment of goals. She/he must have 5 years experience managing large scale operations with data processing and printing components. Experience in budgeting and fiscal management is essential. A masters degree in a relevant field is a requirement. The Director of Operations must have proven interpersonal and personnel management skills. The Director of Operations is the "Sergeant Major" of the NCEEE.

Subject Area Co-ordinators (6 full-time).

Each Subject Area Coordinator will be responsible for the test development activities within his group of subjects. For Mathematics and Arabic Language the Subject Area Coordinator will serve as Subject Officer. The other Coordinators will have the following responsibilities:

Social Studies - Responsible for coordination of Geography, History, Philosophy, Psychology, Islamic Religion, Christian Religion

Science - Responsible for coordination of Biology, Chemistry, and Physics

Foreign Languages Responsible for coordination of English, French, German and Italian

The Subject Area Coordinators will advise and assist the Subject Officers in carrying out their duties. When the Coordinator is responsible for only one subject he will serve as Subject Officer.

Among the specific duties of the Subject Area Coordinators will be:

- a. to schedule subject committee meetings in collaboration with the Subject Officers
- b. to attend all subject committee meetings in his/her area of responsibility
- c. to ensure, to the extent possible and appropriate, comparability of objectives and format among the examinations for the subjects under his/her responsibility

- d. to serve as liaison between the Director of Test Development, the Subject Officers and individual Test Committees
- e. to collaborate with the Subject Officers in the identification and evaluation of prospective test committee members
- f. to participate in training and orientation activities for teachers, supervisors, item writers etc.
- g. to represent the NCEEE at professional meetings and symposia in his/her areas of expertise
- h. to stay abreast of developments in those subjects for which he/she is responsible
- i. to serve as a professional and technical resource to the Subject Officers under his/her responsibility

Minimum Requirements

A master's degree in one or more of the subject fields of his responsibility.

Senior Teacher status with a minimum of 10 years teaching experience in a relevant field

Experience in developing examinations within his/her field of specialization

Proven ability to work with committees or other small professional groups

Ability to communicate effectively orally and in writing

Subject Officers (15 part-time).

Responsible for test development activities in connection with examinations in his/her specific field of specialization under the direction of a Subject Area Coordinator. There is one Subject Officer for each of the following subjects:

(Science) Biology
 Chemistry
 Physics

(Social Studies) Geography
 History
 Philosophy
 Psychology
 Islamic Religion
 Christian Religion

(Foreign Languages) English
French
German
Italian

(Religion) Islamic Religion
Christian Religion

[The Subject Area Coordinators for Arabic language and Mathematics are the Subject Officers for those subjects.]

Duties:

Each Subject Officer will:

- a. serve as a resource to, and staff support for the Subject Matter Committee
- b. aid the Subject Matter Committee in setting specifications
- c. recommend appointments to the Subject Matter Committees
- d. recommend item-writers and reviews in his/her subject
- e. evaluate the contributions of item writers and reviewers
- f. participate in training item writers and reviewers
- g. review and evaluate all items submitted in his/her field
- h. arrange for external review of items
- i. write, review and revise examination materials as needed
- j. assemble tests in his/her field of specialization
- k. oversee production of examinations in his/her field of specialization
- l. arrange for external reviews of examinations
- m. assure quality of examinations by performing necessary quality control procedures
- n. participate in workshops and seminars to disseminate test results and provide in-service training to teachers

and supervisors

o. to be informed of developments in his/her field of specialization

p. to prepare and submit to the Subject Area Coordinator minutes of Subject Matter Committee meetings and such other reports as may be requested

Minimum requirements:

Masters degree in field of specialization.

A minimum of five years experience as a Senior Teacher in secondary schools or as a university faculty member

Knowledge of basic principles of measurement

Proven ability to construct examinations in his/her field of specialization

Ability to provide both staff support and leadership to teams of senior professionals

Terms of Employment:

Four options have been considered for employment of the Subject Officers.

- a. the Subject Officer is elected from among the members of the Subject Matter Committee, is paid for the extra duties and serves for three years
- b. the Subject Officer is hired as a full-time permanent employee of the NCEEE
- c. the Subject Officer is a part-time permanent employee of the NCEEE holding an academic appointment elsewhere
- d. the Subject Officer is a full-time temporary employee serving and two to three year term as is seconded from the MOE or other educational agency.

Advantages/disadvantages

Option a: a Subject Officer elected by the Committee would likely ensure the respect and cooperation of the committee

committee members will be senior people with many other responsibilities and unlikely to be able to devote the time necessary to carry out the functions of the Subject Officer

Option b: a full-time permanent position provides

flexibility for additional assignments and tasks and can ensure expeditious completion of work

given the scope of work expected during the first years of the NCEEE a full-time post would probably not be necessary; the full-time Subject Area Coordinator will provide any needed back-up

Option c: a part-time permanent Subject Officer with the support of a Subject Area Coordinator should be able to perform the duties required during the first years of the NCEEE; increased work in future could necessitate a full-time Subject Officer

Option d: the advantages of a full-time Subject Officer are clear, as in Option b. An additional advantage of a Subject Officer seconded from another agency is that ties between the NCEEE and other educational agencies can be strengthened

allows the NCEEE to appoint the best available person in that agency; it also relieves the NCEEE of a long-term commitment to a staff member who might not perform acceptably. On the other hand, the NCEEE can lose a subject Officer just when he/she has become most productive

APPENDIX VII.

Training

The Executive Director should spend 1 week at each of 2 major testing organizations in the UK and US. During that time he will meet with the chief executive and operating officers, section chiefs and operations directors in order to obtain an overview of policies and procedures used in the conduct of national examinations programs. Among the topics to be covered are:

- examination systems and national educational policy; examinations for university admission
- staffing; recruitment, qualifications, responsibilities; coordination and articulation with educational institutions;
- application of technology to large-scale testing programs; funding sources for national evaluation centers; collaboration on international projects.

The Director of Test Development should spend 2 weeks at a major testing agency in the UK or the US. During that time he will meet with his counterpart and other staff as appropriate. Among the topics to be covered are:

- setting test objectives and specifications;
- testing formats - objective and free response

recruitment, training and quality control of item writers; relationship of curriculum development to testing; assuring validity and reliability of national examinations; test development quality control procedures; application of technology to test development.

The Director of Research and Analysis should spend 2 weeks at a major testing agency in the UK or the US. During that time he will meet with directors of statistical analysis and research units. Among the topics to be covered are:

- types and value of various item and test analysis reports; item analysis programs;
- sampling, norming, scaling and equating;
- design of reliability and validity studies;
- interpretation of test results;
- identifying test related research;
- evaluating external research proposals;
- monitoring research projects.

The Director of Training and Dissemination should spend 2 weeks as a major testing agency in the UK or the US. During that time he will meet with key staff members responsible for in-service training and public information. Among the topics to be covered are:

- training item writers and reviewers;
- training test center supervisors/invigilators;
- designing and conducting programs to train teachers to use examination results to improve instruction.
- identifying and informing publics of organizational goals, objectives, activities, media relations; press, radio, tv, informational products; flyers, reports, sample papers etc.

The Director of Operations should work with an experienced, senior director of operations for a major testing organization for 3 months in Egypt. It is recommended that this orientation, training and "start-up" program take place in Egypt so that the advisor can adapt his training program to local conditions. The program will not only provide "hands on" training, but should lead to the establishment, implementation and documentatin of operational procedures for the NCEE in such areas as:

- determination of hardware/software needs
- development of schedules for: test production, printing, answer sheet processing, data analysis, score reporting, determination of personnel needs for operations, development of operations budgets, development of planning documents.

Each **Subject Area Coordinator** should join the staff of a major testing organization in the UK or the US for one month. During that time he/she will work closely with a counterpart in the same field, ie Science, Foreign Languages. The coordinator will study the procedures used in such areas as:

setting specifications; item writer training and evaluation; test assembly; test committee composition, conducting committee meetings; test production; use of item analyses.

This training should be a "hands on" experience. The coordinator will attend test committee meetings, assist in the actual development of examinations, will study and interpret test results. Arrangements should be made so that the contribution to this training is "in kind", that is that there be no payment. The advantage to the host organization will be the professional contribution of the NCEEE coordinator to the work of the host.

[This training program might not be appropriate for the coordinators of Arabic and Religion since suitable counterparts might not be available in the UK or US. Perhaps appropriate counterparts could be identified elsewhere, such as in Turkey.]

Because the **Subject Officers** will probably be on part-time assignment, and because their number is large, it would be more efficient to carry out training in Egypt. Therefore we recommend that test development specialists from the UK and/or the US should develop and conduct a training program in Egypt for the Subject Officers in Mathematics, Social Studies, Foreign Languages and Science. It is also recommended that specialists in Arabic and Religion should, if possible, be brought in to do the same.

We recommend that the Subject Officer training program follow these general guidelines:

- a. the product of the training program will be a test development manual for each subject describing in detail the procedures for performing all the duties of a Subject Officer;
- b. the Subject Area Coordinators collaborate with the visiting specialists in the design of the training program and the development of the manuals (it is important that the test development manuals for the various subjects be as similar as possible since policies and procedures across the NCEEE should be uniform, ie committee structures, payment, schedules etc.)

- c. the visiting specialists meet with the Subject Area Coordinators after each training session to debrief and make any changes in planning for the next session
- d. the Subject Area Coordinators collaborate with the visiting specialists in conducting the training sessions
- e. the full group of Subject Officers, visiting specialists and Subject Area Coordinators meet together periodically during the training program to discuss problems and issues and to encourage commonality of procedures and policy
- f. the training program will take place over 15 working days for the participants, from 9:00 a.m. to 2:00 p.m.
- g. the visiting specialists will provide the Subject Area Coordinators with preliminary drafts of the training program for review and comment prior to coming to Egypt. Each training program will be approved by the Director of Test Development
- h. part of the training program will consist of the development of a "mini-test" in each Program Officer's subject replicating all the steps that will occur in development of an operational test

In May and June of 1990 a group of 4 senior teachers in each of 4 subject areas, science, mathematics, social studies and foreign languages, will undergo intensive training in the UK in test development procedures. This group has been trained previously in item writing by the Cambridge Syndicate in Egypt. it is expected that members of this group will be potential candidates for the positions of Subject Area Coordinator and Subject Officer in the NCEEE. It is also expected that many of them will participate in conducting training programs for NCEEE staff and for teachers in the field.

Both the Computer Manager and the Printing Manager who report to the Director of Operations will be provided training either in the UK, the US or in Egypt. The amount, location and focus of training will be determined after evaluation of the background and training of the persons selected.

APPENDIX VIII.

Continuity and development of the NCEEE.

If targets for implementing change are to be met, it is vital that certain actions must begin without delay.

Two possibilities have been suggested for maintaining progress after the feasibility study.

1. A full-time, expatriate appointment to support the Executive Director as a Senior Adviser.
2. The Feasibility team would make periodic return visits to offer support at crucial stages of the test development.

Advantages and disadvantages

Senior Adviser This person would be assigned to the Executive Director to deal with major policy and administrative issues. He/she would be available full-time for two years to the Executive Director and would provide the expertise and experience of a chief executive officer. Such an appointment represents a large investment of funds. The Senior Adviser would not provide consultation on operational professional and technical issues.

Feasibility Study Team.

They would provide direct assistance to the various directors and staff in their areas of expertise, test development, training, interpretation of test results, dissemination. Additionally, they would provide continuity from conception of the NCEEE through implementation and operation. The costs would be modest, primarily travel and lodging and a total of approximately 80 work days. The feasibility team members will not be available for consultation on site except during the key events.

It would be inappropriate for the Feasibility Team to make a recommendation here.

APPENDIX IX.

Organisational Options.

Three possible roles for the NCEEE were suggested by the

Team as follows.

1. **NCEEE as a consultative/advisory body to the MOE.**

Three professional staff with expertise in test-development, statistical analysis and research provide technical support to the MOE for test development and interpretation at the request of MOE. No direct control over examinations.

Advantages: little disruption of system; little expense

Disadvantages: little opportunity to effect change in tests or curriculum.

2. **NCEEE as the responsible body for setting policy, question papers and procedures for national examinations.** Begins in 1990 with core staff of eight full-time professionals. First task of the NCEEE will be introduction of "A" level papers leaving most operational tasks assigned to agencies currently responsible.

Priorities are

(1) introduction of "A" level papers,

(2) development of item banks in each sector for objective test sections of the Thanawiya 'Ammah, banks could later serve for development of object sections of the "A" level papers, the Adadiya 'Ammah and promotion examinations,

(3) introduction of appropriate technology, ie optical scanning, desk-top printing, bar coding etc.

Advantages: Immediate introduction of reform to examination program; autonomy of evaluation unit; uses resources already in place; causes little disruption to existing system of operation; establishes climate for on-going change.

Disadvantages: increased cost over current system; accelerated schedule for development; possible alienation of some senior people.

3. **NCEEE as a complete, self-contained, centralized agency responsible for all evaluation activities including operational tasks such as printing, test center management, marking, hiring temporary staff in the sectors etc.**

Advantages: policy setting and implementation is simplified and changes can be put into effect quickly; all staff are "employees" of the NCEEE and should be committed to it;

Disadvantages: an NCEEE thus configured would take 3 to 4

years to be operational; start-up costs would be very high; disruption of current system would be great; administrative tasks already performed adequately would be added unnecessarily; many staff would be "disenfranchised".

APPENDIX X.

The Team has a considerable quantity of test material which will illustrate the sort of difference envisaged between the ordinary and advanced level Thanawiya Amma question papers. Two examples from Mathematics will be sufficient here.

Question 1 shows a sequence in which different numbers of matchsticks are laid out in squares. The question asks for the sequence to be continued and then for a formula to be derived which will generalise the number of matches required for any number of matchsticks.

The significant thing about this example is that very little mathematical CONTENT is involved, but some original PROBLEM SOLVING skill is required. In other words, the emphasis on recalled knowledge is reduced in favour of some original thought.

The second example is much like the first. The basic mathematical content is a mere knowledge of adding and dividing, tasks within the reach of young children. But this item tests the ability to generalise and express ideas in an abstract form. In other words, it tests the ability to think like a mathematician at a humble level.

The Team recommends that the Interim Advanced Level papers should be of this nature, in the various subjects tested in the 1992 examinations. In the longer term new syllabuses should be developed to increase the knowledge base of the advanced papers, by the 1995 examinations.

APPENDIX XI.

Optional Structures NCEEE

The Team proposes that those responsible for drawing up the legal constitution of the NCEEE should include the following details.

1. The Center will be an independent, autonomous not for profit body charged with providing examination and evaluation services to the educational and other communities in Egypt.
2. The Center will have the power to establish its own terms of employment with its staff.

3. The Supreme Council of the NCEEE will answer to the Prime Minister.
4. The Executive Director will give at least five days of full time service per week to the Center.
5. It should be a condition of employment that the other Directors work full time for the Center without other employment.
6. The Center will be an independent body with the exclusive right to supply services to the Ministry of Education. It will also have the right to sell its services to other governmental and non-governmental bodies.
7. During the first years of the Center the major activity will be the design, development, production, printing, analysis and reporting of the Thanawiya 'Amma basic and A level papers.

The Center will be self-supporting. Operating income will be derived from fees paid for services. It is proposed that the Thanawiya 'Amma be supported as follows:

- a. a fee per candidate equivalent to the current costs for test development, production, printing, analysis and reporting be negotiated and paid to the NCEEE by the MOE; the estimated cost per candidate for the Thanawiya 'Amma is estimated at LE 107. Candidates pay LE 7. Thus the cost to the MOE is LE 100 per candidate. Of the LE 100 a major portion is represented by administrative charges for registering candidates, supervising examination centers, training and paying markers, marking papers, registering and verifying marks, storing and distributing examination materials. In order to determine the appropriate fee to be paid by the MOE to the NCEEE a careful breakdown of the LE 107 total expense must be made. Those charges representing tasks relating to the Thanawiya 'Amma that will continue to be carried out by the MOE are deducted from the LE 107 figure. The remaining monies should represent the fee paid to the NCEEE for the following activities:
 - selecting and convening Executive Committee and sub-committees
 - selecting and convening subject matter committees
 - paying item writers
 - providing staff and materials for item writer training
 - reviewing newly written test items
 - operating central item bank for Thanawiya 'Amma
 - producing, administering and analyzing pre-tests
 - scoring and analyzing pre-tests
 - producing and distributing bulletins of information and sample materials
 - producing, printing and delivering basic and A level papers for Thanawiya 'Amma

providing staff and materials for training markers
scoring objective papers, merging scores for all papers
performing item and test analyses for all papers
preparing and conducting in-service workshops to
disseminate examination results

8. Fees for services will be negotiated on a regular basis by the two bodies as will the specific services to be provided. For example, should the NCEEE obtain appropriate computer equipment, the Ministry may wish to negotiate with the NCEEE for all data processing of marks for the Thanwiya 'Amma and Advanced Papers. It is suggested that a process for arbitration of fees be considered in the event of disagreement between the two bodies.

9. With the introduction of the Advanced Level papers, a direct candidate fee of £E 25 be charged. This fee should be paid directly to the NCEEE to cover the costs of providing papers in two subjects for each student.

We make this recommendation because we believe it is essential that the Center should have a source of income which is independent of other sources.

We recognise that the Ministry in turn would need to negotiate for part of this fee to be paid to the Ministry for the services it would render to the Center for the administration of advanced level examinations.

We suggest three possible models for funding test centres, but we recognise that these may be inappropriate or may require major adaptation for application in Egypt.

FUNDING: A U.S. MODEL

Funding for major U.S. testing organizations comes primarily from fees charged to examinees. At the Educational Testing Service (ETS) the system works as follows for the College Board university admissions tests.

1. Each year the College Board presents ETS with a scope of work.
2. Each department at ETS that works on College Board tests submits to ETS administration a budget estimate for the work required.
3. ETS administration develops an overall budget for submission to the College Board.
4. ETS and the College Board negotiate the scope of work and costs. Activities in the scope of work may be reduced or eliminated. The budgets cover fixed and variable costs.

5. The fees for examinees are set by the College Board with the approval of the Board of Trustees and the membership.
6. Examinee fees are collected by ETS and all test related expenses are paid by ETS.
7. The College Board pays ETS according to the agreement and retains all other funds collected .
8. ETS performs all activities in connection with the examination program. The College Board sets policy and consults and informs its university and school membership.

Approximate number of examinees per year: 1,000,000+

It is unlikely that the NCEEE would carry out the full range of examination activities that ETS does. Nevertheless, the principle of payment for specific services rendered could apply in the case of the NCEEE.

FUNDING: THE PUERTO RICAN MODEL

1. The College Board of Puerto Rico conducts two major examination programs. The "Prueba de Aptitud Academica" an examination given to all secondary school students at the end of school, and the Advanced Placement program.
2. The Prueba de Aptitud Academica is heavily subsidized by the Department of Education of Puerto Rico. Examination results are used by the Department for policy decisions. The examination is also used by the universities for admissions purposes.
3. A modest fee is charged to examinees for the Prueba de Aptitud Academica. It is not sufficient to cover actual expenses.
4. The Department of Education has some say in examination policy. For example, students who cannot afford to pay for the examination are not charged. The Department of Education pays the fee.
5. The Advanced Placement Program is completely independent of the Department of Education. The examinations are taken by students who desire advanced standing at university. The costs for the program are covered totally from examinee fees. Policy is determined by a committee with representation from the universities, private and public secondary schools.

Approximate test population: 50,000

FUNDING: THE SCOTTISH MODEL

Funding for the Scottish Certificate of Education offers one possible model for the NCEEE. The system works as follows:

1. The Board, whose members include representatives of both government and independent schools, prepares a detailed budget for the following financial year.
2. The budget is presented to the combined Educational Authorities (EAs) for their consideration.
3. The EAs usually ask for cuts to the proposals. The Board responds by pointing out that cuts would mean some diminution of the service and they ask the EAs to indicate which part of the procedures they consider unnecessary or undesirable. The EAs respond by making suggestions and some kind of compromise is agreed.
4. The global sum for the budget is divided by the anticipated number of candidates and a fee for each individual candidate presentation is calculated.
5. When the examinations have been taken, a bill is sent to each EA or independent school for the number of candidates they have presented.

This would be a possible mechanism for the NCEEE once the new system is up and running. Its success would depend on being able to estimate the number of candidates in the following year.

However, the Team believes it is vital for the NCEEE to have a direct source of income, such as the fees for advanced level paid directly to the Center. With this income there would be realistic negotiations with the Ministry who would supply services to the Center, and would in turn receive services from the Center. For example, the system might work as follows:

Services supplied from NCEEE to the Ministry:

- i. supply of all question papers and marking instructions;
- ii. machine marking of all objective test papers.

Services supplied from Ministry to NCEEE:

- i. that proportion of the processing of candidate entry forms, allocation of examination centres, arrangements for invigilation which relate to Advanced Level papers etc.
- ii. marking of non-objective advanced level papers.

Thus each would be supplying services to the other, and careful costing of each stage of the process would be necessary.

Although this system may seem complicated, we feel something like it is necessary to ensure the financial independence and autonomy

APPENDIX XII. AKNOWLEDGEMENTS

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Dr Haridi, Undersecretary of Education
Dr Salah Mourad, Faculty of Education, Mansoura University
Dr Mohammed Sabbour, Faculty of Medicine, Ain Shams University
Dr Amina Kazem, Women's College, Ain Shams University
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Dr A S Hartwell, Educational Planning Unit, NCERD

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APPENDIX XII

GLOSSARY

The following terms are used in this report.

Adadiya 'Amma An examination given to all students at the end of Middle School

**"A Level"
Advanced Level** An examination administered in the UK for admission to university

These terms are also used in the report to refer to the Interim (with the same content) and Revised (additional content) papers of the Thanawiya Amma

Answer sheet A machine readable sheet for recording responses to objective test questions

Bar code

Cut-score/ Cut-off score	A score or mark used for decision making, eg marks below the cut-score fail, those above pass.
Dissemination	Processes for informing the public.
Equating	Statistical procedures for making scores on different versions of an examination comparable.
Governorate	One of the 26 politico-geographic areas of Egypt.
Item	An examination or test question.
Item bank	A collection of items categorized and stored electronically or on paper.
Items - objective	Examination questions that require no written response by the student, ie multiple-choice, matching items.
Items - subjective	Examination questions requiring a response constructed by the examinee.
Mark/grade/score	The rating or evaluation assigned to an examinee's answer to an item or paper.
"O level" Ordinary level secondary	An examination given to all students in England at the end of compulsory secondary school.
Paper	An examination or test.
Pre-test characteristics.	A trial test of new examination questions to determine their characteristics.
Sector	One of the four administrative regions into which Egypt is divided for the administration of the Thanawiya 'Amma.
Spiralling	A procedure whereby various versions of an examination, eg A,B and C, are administered to examinees in a fixed order, ie ABC, ABC. Each student takes only one version.
Thanawiya 'Amma	An examination administered in Egypt to students at the end of General secondary education. (Students in agricultural or technical secondary schools are not included.) It is used both as a secondary leaving examination and for

university admission.

Test objectives The content and/or skills to be covered in an examination.

Test specifications examination. The "blueprint" or precise design for the format and content of an examination.

. **AID** Agency for International Development (US)

MOE Ministry of Education (Egypt)

NCEEE National Center for Educational Evaluation and Examinations (Egypt)

NCERD National Center for Educational Research and Development (Egypt)

ODA Overseas Development Agency (UK)