DOCUMENT RESUME

ED 312 926 HE 022 964

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TITLE	Toward Reform of Egyptian Higher Education: Final Report on Cairo University/Boston University Collaboration in Counterpart Training for the Third Education Project.
PUB DATE	Dec 88
NOTE	43p.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Curriculum Development; Developing Nations; *Educational Change; Enrollment Trends; *Faculty Development; Foreign Countries; Higher Education; Institutional Survival; Student Evaluation; *Teacher Education; Teacher Improvement
IDENTIFIERS	Boston University MA; *Cairo University (Egypt); *Egypt

ABSTRACT

In 1981, the Egyptian government sought assistance from the World Bank's International Developmental Agency for the Cairo Univesity-IDA Third Education Project. The World Bank loan was designated for training faculty leaders capable of modernizing instruction at Cairo University and for equipping the faculties of agriculture and medicine with up-to-date scientific instruments, laboratory apparatus, and technology for the improvement of instruction. The project also supported a counterpart training program between Cairo and Boston University; the contributions of this program are documented, and the project's major initiatives in the area of faculty training our outlined. The first four papers of the six sections are as follows: (1) introduction (background and present conditions); (2) the Egyptian strategy for higher education reform (reduction of enrollments, revision of curricula and courses for study, use of modern instructional media, more frequent and appropriate student evaluation, and improved preparation of university lecturers and instructors); (3) counterpart training: Cairo University and Boston University (expectations at Cairo University, faculty participation, and curriculum for the short-term fellowship programs); and (4) progress toward educational reforms (faculty of medicine, faculty of engineering, faculty of agriculture, Higher Education Training Institute, and individual efforts). Recommendations are offered in section 5; advocated actions include the following: promote the use of the health education resources center; develop a plan for increased use of computers; and continue use of short and long term study abroad. The sixth and final section offers a brief concluding summary of this report. (SM)

TOWARD REFORM OF EGYPTIAN HIGHER EDUCATION:

FINAL REPORT ON CAIRO UNIVERSITY/BOSTON UNIVERSITY COLLABORATION IN COUNTERPART TRAINING FOR THE THIRD EDUCATION PROJECT

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December, 1988

This report is dedicated to the memory of Dr. Yehia el Batawi, Director of the IDA/Cairo University Third Education Project from its inception in 1980, and Dean of the Cairo University Faculty of Medicine from October, 1987 until his untimely death in March, 1988. His leadership toward the improvement of higher education and especially medical education in Egypt was exceptional. It is a most fitting tribute that the Health Science Resource Center at Cairo University has been named in his honor.

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I. INTRODUCTION AND OVERVIEW

In 1981, the Egyptian government sought assistance from the World Bank's International Development Agency for the Cairo University - IDA Third Education Project. The subsequent World Bank loan was designated for training faculty leaders capable of modernizing instruction at Cairo University and for equipping the faculties of agriculture and medicine with up-to-date scientific instruments, laboratory apparatus, and technology for the improvement of instruction.

This document outlines the project's major initiatives in the area of faculty training, reviews the expectations of key leaders, describes the counterpart training and evaluates the impact to date. The report also includes specific recommendations to Cairo University, to Egyptian leaders, and to the World Bank on immediate next steps as well as long term strategies to bring about additional modernization of higher education in Egypt.

The Third Education Project was set in the larger context of planning for significant reform of higher education in all faculties at Cairo University, a reform effort which mirrored national attention given to the improvement of education at all levels. Egyptian authorities had undertaken the construction of a Health Science Resource Center at Cairo University. Ten years in the making, the new facility on Cairo's Manyaal campus on Roda Island was opened formally in 1988. Construction is underway on the main Ghiza campus for a new building for the Faculty of Engineering. In addition a site has been selected for the construction of a facility to house the Higher Education Training Institute, a center for improving university instruction, which serves all of the faculties at Cairo University.

Egyptian leaders have adopted many strategies necessary to bring about the desired reforms -- construction and equipment of facilities, changes in admission policies, improvement of curricular programs, and the training of faculty leaders who would set the reforms in motion.

This report focuses especially on the latter aspect of Cairo University's comprehensive strategies for educational reform -- counterpart training between two universities. However, any final report on this strategy should review not only the efforts to improve methods of instruction and evaluation but also the related physical and human accomplishments in the larger context of the reform of higher education generally.

A. Background

Cairo University has become a major resource for national and regional development in Egypt and throughout the Middle East. Its curriculum and academic policies in many cases provide the model for academic programs at the new government universities in Egypt and in other Arab countries as well. Cairo University is keenly aware of the need for educational reform and its responsibility to exert leadership in correcting problems which have resulted from overenrollments, decline in academic standards in certain facilities, and the production of graduates beyond the manpower needs of the country. Some historical context is provided to describe the nature and extent of the problems.

Now 80 years old, Cairo University was founded in 1908 as a small, private, liberal arts school. It became a public institution in 1925, incorporating existing medical, law, and arts faculties and a new science school. By the 1940's, the 10 schools enrolled about 10,000 students. The 1952 Revolution in Egypt brought to power a group interested in promoting social mobility and nationalism through education. Immediate and far-reaching reforms included new, unified, compulsory, free primary education for all. The changes extended to higher education as well.

Other government universities followed the establishment of Cairo University, with enrollments growing gradually at first, and then at a rapid pace to accommodate the government's new policies for equalizing opportunities and opening higher education to talent outside of the privileged classes. By 1957, about one-third of those who finished secondary education went on to higher education; by 1967, the figure rose to two-thirds.

B. Present Conditions

The popular desire for social mobility through education has resulted in considerable sacrifice in academic standards and a chronic overabundance of degree holders. Increasingly, the graduates of more recent years, particularly those in the less selective faculties, have not been prepared with skills in demand in the economy. Until recently the government's avowed policy was to offer employment to all graduates, but the enormous bureaucracy could not absorb these aspirants to white collar jobs in productive, meaningful employment. The policy has been officially changed. Several recent graduates through entrepreneurial efforts have created new employment opportunities for themselves but still many of those prepared in scientific areas lack practical knowledge at levels required by industry.

The universities now enroll more than five times the student capacities they were designed to accommodate. Severe overcrowding has served to perpetuate certain detrimental aspects of their education system; the emphasis on rote lear g and passing examinations has continued to the detriment of original thought and analysis. In addition, the large enrollments have limited possibilities for providing and supervising important experiences for students in laboratories, clinics and field settings.

The university admissions policies have also had a pervasive impact on the distribution of talent across and within the system of higher education in Egypt. To open the universities to talent rather than to privilege, the Egyptian government instituted an examination system. Those with the highest scores choose the more prestigious faculties at the more prestigious universities, with little regard for personal fit to professional field. Generally medicine, science, and engineering are the top choices, and the relative age and status of the government universities favor Cairo University over the newer provisional institutions. One undesired effect of the admission policy is to foster involvement in a field of study in which an individual student may have little genuine career interest.

Egyptian higher education now serves 500,000 students, almost one third of them studying at Cairo University whose enrollment is 152,000 students. The Cairo University Medical School enrolls 8000 students and the Engineering School enrolls 7000 students. The expansion of Cairo University to these numbers, largest in the Middle East and Africa, second largest in the world, represents a strong commitment to expanding access to those professions which serve humanity as well as national development. Egyptian leaders also turned their attention to issues of quality and modernization of the higher education programs.

II. THE EGYPTIAN STRATEGY FOR HIGHER EDUCATION REFORM

The leadership of Cairo University, with the support of the Supreme Council of Universities, decided during the 1970's to take a series of steps to respond to serious criticisms of Egyptian higher education. Among the most serious concerns were the following:

A. That more students are graduated each year than can find appropriate employment;

B. That the curriculum and specific courses are theoretical, abstract and fail to meet the needs of the national economy;

C. That lecturers and professors used the same stilted lecture format that they themselves endured in the prior generation, and that they do not use modern instructional media in their teaching;

D. That student evaluation methods heavily favor rote memorization for end-of-year examinations rather than more frequent testing emphasizing higher order thinking and problem solving; and

E. That faculty members must be appropriately trained in instructional skills if they are to adopt more effective teaching and evaluation practices.

It is possible for the newer, smaller Egyptian universities to work on these issues and create their own solutions. However, all of Egypt and much of the Arab world watch Cairo University, the "mother campus" and source of so many professors, to determine which educational reforms and instruction changes can be accepted.

It should also be noted that the work of the convention meeting in August, 1987 for the Reform of Higher Education in Egypt addressed these concerns and developed plans for continued reform. Also, throughout Egypt a group of coordinated committees for reform of public education continue to deliberate about changes in curriculum.

A. Reduction of Enrollments

During the 1960's and 1970's Egyptian leaders took vigorous action to respond to serious manpower shortages in almost every professional and technical field. One Egyptian educator explained the reason for commitment to a major expansion of higher education opportunities, especially in medicine: "If many more doctors could be educated, then health care could become widely available and very inexpensive for the masses, which would be very positive."

There were compelling reasons for stimulating a dramatic increase in the number of Egyptian doctors:

1. Egypt during the 1950's and 1960's suffered from infant mortality rates among the highest in the world.

2. Diseases such as dysentery and cholera along with severe physical handicaps such as trachoma and blindness were widespread.

3. Only 3,000 medical doctors served a rapidly growing population and most of the medicine was available only in the cities and for those who could afford to pay.

Cairo University expanded the medical school as rapidly as possible to increase the number of medical doctors. Meanwhile, the number of Egyptian medical schools increased from 6 in 1978 to 11 in 1987, several of which became almost as large as Cairo University. Now, the production of 4000 new doctors a year appears to exceed Egyptian capacities to absorb and use this talent.

The Egyptian government had been so supportive of higher education attendance that an offer of employment in the public sector was guaranteed as an incentive to any college graduate. Recently rescinded, this generous but misguided policy still carries heavy cost burdens and built up a much larger public bureaucracy than needed. The policy also promoted feeling of disillusionment that comes from chronic underemployment of college graduates.

Medicine, the most prestigious profession in Egypt, continues to face a serious problem in cutting back admissions because so many families want their offspring to study medicine. New medical schools were founded; regional medical schools expanded, and a total of 86,000 doctors graduated by the mid 1980's. The ratio of medical doctors to the total population has dropped from 1 in 10,000 to less than 1 per 700, a most remarkable accomplishment. However, the traditional overseas market for Egyptian medical doctors is shrinking as other Arab nations develop their own medical schools and the Egyptian market for doctors, except in remote areas, is saturated.

Cairo University which admitted more than 1000 new medical school students each year in the late 1970's agreed to reduce the entering classes by 10 percent each year to 900, 800, 700 and admitted 600 in 1987. The ultimate goal is a reduction to 300 new enrollments each year of the most able medical students. These and other decisions will reduce the 1980 undergraduate enrollment of 10,000 medical students to 3600 by 1990 and eventually to a total of 1800 in the 6-year undergraduate medical program.

Similar policies are being enacted for the faculties of dentistry and engineering at Cairo University. The dental faculty is the largest of five Egyptian dental schools. Currently enrolling 300-350 students a year, the Cairo University Faculty of Dentistry will, over the next four years (by 1991), decrease new enrollments to 150 a year.

Seven thousand students (2500 graduate diploma students) are enrolled in the Faculty of Engineering currently. Another 18,000 students attend thirteen other Egyptian engineering schools, for a total of 25,000 engineering students. During the early 1980's the Cairo University engineering faculty during the early 1980's accepted as many as 1200 students a year but has authorized a 20-30 percent reduction. For 1988 the number of new students totalled 800. The eventual goal for new admissions to Cairo University Faculty of Engineering is 500 students per year. However, in 1987 the number actually increased to 900 due to applications from Egyptian students returning from other nations and admission of a number of technical school graduates and GCE students choosing engineering.

A mounting surplus of engineers creates a problem since the government, which previously guaranteed employment, has employed more than needed and is two or three years behind in employing new graduates. Graduates in architecture must accept interim jobs as draftsmen or construction site supervisors, roles which do not require university training or degrees.

Similar problems exist for graduates of other faculties, even those which limit their enrollments in the interest of achieving a high quality of instruction and favorable faculty-student ratios, like the Faculty of Medicine at Suez Canal University and the Faculty of Agriculture at Cairo University's Fayoum Campus. These university graduates still must compete in the larger job market. Young medical doctors face serious underemployment if they choose to practice in greater Cairo. Less than 40 percent of the graduates in agriculture can find employment as agricultural engineers; others glut the Ministry of Agriculture working at desk jobs or gain employment outside of their area of training, as store clerks, for example.

Considerable debate continues over policies to reduce enrollments in higher education, but it is expected that a trend toward more selective admissions practices will take hold. This policy recommendation was upheld in the proceedings of the August, 1987 convention for the Reform of Higher Education.

B. The Revision of Curricula and Courses of Study

The traditional European university model continues to dominate the practice of higher education in Egypt. There is great stress on the transmission of subject matter rather than on the uses of knowledge or strategies for discovering new knowledge. Not only are the university curricula difficult to change, but limited availability of books and learning materials and the very large numbers of students inhibit change as well.

Professors may recommend a text but it is often very expensive and not readily available to Egyptian students. More typically students memorize their lecture notes in preparation for examinations or buy lecture notes from faculty, a practice which is highly criticized but still prevalent. Some faculty distribute handouts to students free of charge which summarize the basic facts and concepts on which there will be an examination, but these faculty members must absorb the cost of producing these handouts personally. Lectures are often delivered to groups of from 200 to 400 students, even up to 1000 or more. Fortunately smaller classes with sections of 20-30 students are used for laboratory, clinical, or field work, but even this size group is too large for some goals.

Egyptian educators intend to change the format of university education. Cairo University has begun to implement a coherent and practical strategy of curriculum revision or course development in which the faculty members

1. Review the general directives of their respective sector committees;

2. Establish the overall program design;

3. Determine the course objectives including higher order skills of analysis and problem-solving;

4. Specify the subject matter and most appropriate projects, assignments, laboratory exercises and other course activities, only some of which will be lectures; and

5. Design the most useful sequence of instructional activities arranging for frequent evaluation of what has been learned so that students have the necessary feedback on what skills they have mastered.

This more thorough and rational system of program and course development differs from the traditional British university model and is clearly more suited to training professional practitioners for service in the year 2000 and beyond.

C. Use of Modern Instructional Media

Most university professors and lecturers rely heavily on oral presentations. Unfortunately, this is true not only at Cairo University but in most universities. The teaching devices typically used are the jawbone and chalkboard. In many classes these are the only instructional methods employed.

Since 1981, Cairo University has sent at least sixty faculty members to Boston University, and still others to Dundee Technological Institute, Scotland and to other locations to become skilled in the use of modern instructional technology and media.

The new instructional media include videotapes, slides, overhead transparencies, films, recordings, computers and word processing units. These methods require a substantial investment in machines, visual materials, specialized spaces and staff, and faculty training, all of which Cairo University officials have agreed to provide.

Participating faculty members have expressed considerable enthusiasm for using audio-visual aids in instruction. They are keenly aware of the difficulties in teaching medical microbiology, or dental surgery, or engineering by lecture without visual aids, depriving the students of a chance to see the organisms, procedures, or structures under discussion.

D. More Frequent and Appropriate Student Evaluation

Each school or faculty determines the frequency and method of student evaluations. Traditionally, Egyptian University faculties award as much as 70-80 percent of the total credit for a course according to student performance on an end of year examination consisting of both short and long essay questions. Some credit, typically 20 percent, is given to a midyear examination or other academic efforts during the year.

Egyptian students complain that the overwhelming emphasis in preparing for examinations is on rote memory, such as the cramming of facts on causes of diseases and their treatment which must be recited accurately and at high speed on an essay exam. Students receive very little credit for creativity, originality, problem-solving or other higher level thinking skills which are needed for practical employment, private or public service, or national development.

Individual professors at Cairo University report that they have begun to provide for more frequent examinations, additional credit for laboratory or field inquiry projects, and different types of evaluation including the use of multiple choice questions and other alternatives to essay questions. On occasion, entire departments within a faculty and at least one school have revised substantially the methods of student evaluation and decreased the emphasis on a final rote essay exam. Most recently, the medical faculty reported a policy of monthly examinations in academic courses which would contribute 40 to 50 percent of the final grade in those courses.

E. The Improved Preparation of University Lecturers and Instructors

Virtually throughout the world, university appointment practices reflect the unfounded assumption that individuals who have attained a doctorate in their disciplines will be effective instructors of their disciplines, without benefit of training in teaching. Critical of this practice, Cairo University decided in 1974 to offer a short program to

prepare new university instructors and assistant lecturers in how to teach, before they could receive formal appointments to teaching roles at Cairo University. The Higher Education Training Institute was created for this purpose and by 1976 the program for new instructors became compulsory, as it is to the present time. Originally planned as a six-week program, the training has been reduced to a three-week program which addresses the following areas:

- the psychological principles of learning and teaching;
- course development and methods of instruction for higher education;
- development and use of educational media and technology
- a variety of student evaluation techniques;
- special lectures by university leaders on the following topics:
  - Egyptian law as it affects Cairo University
  - political issues in relation to Cairo University
  - leadership of the university teacher
  - liberty and university education
  - role of the university in research

III. COUNTERPART TRAINING: CAIRO UNIVERSITY AND BOSTON UNIVERSITY

The Cairo University-IDA Third Education Project enabled the training of faculty leaders to implement strategies for reform in higher education. The project supported collaboration between Boston University and Cairo University to provide training of faculty in three technical areas:

1. heuristics for program planning and problem solving, and strategies for curriculum development;
2. the use of media to improve instruction; and
3. testing and evaluation procedures, especially alternatives to traditional essay examinations and measures of rote memory.

Boston University agreed to provide faculty both from the Boston University School of Education and the B.U. Medical School's Media Support Center. Twelve Boston University faculty members made site visits to Cairo University. Cairo University professors attended specially designed programs at Boston University (six to eight weeks in duration) and five faculty from Cairo University attended Boston University School of Education for year-long academic programs in educational leadership.

A. Expectations of Cairo University

The Cairo University administrators and faculty held several views of what might be accomplished by the counterpart training. One of the initial and most important expectations was that members of each department in the Cairo University Faculty of Medicine would gain the opportunity to grow more proficient in the strategies of curriculum development, use of media and technology and modern instructional methods, and construction of new evaluation techniques.

The new medical or health science building at Cairo University was intended to provide a place where these skills would be applied, demonstrated to other faculty, especially with respect to applications of media and technology, and where further technical assistance could be obtained. Clearly the new resource center was intended to serve the faculty and students of medicine. The new facility is located at the campus on Roda Island, several kilometers from the main campus in Ghiza. The former dean of the medical faculty at Cairo University described the facility as the Medical Education Resources Center, but clearly the long range plan was to have the facility serve all of the health science faculties.

Indeed, other faculties in the health sciences expressed keen interest in counterpart training under the Third Education Project and wanted to enjoy benefits of the new facility as well. The faculties of Dentistry, Pharmacy, and Veterinary Medicine are located only a few meters from the resource center, and the High Institute of Nursing and Faculty of Physical Therapy are also nearby. In fact, Cairo University sent representatives of these other faculties to Boston for training: two members of the dental faculty, one medical school professor who also teaches in the nursing program, and three faculty members from physical therapy. These individuals and colleagues on their faculties were eagerly awaiting the opening of the center for their use as well. It is noteworthy that earlier documents about the project called the new facility the Health Science Resource Center.

Still other expectations prevailed regarding who should be trained and who would have access to the specialized equipment for media and technology which would be housed in the new center. Most of the fellowship slots were earmarked at the outset for members of the medical and engineering faculties. However, faculty members from other specialities including agriculture, psychology, education and political science applied for and were selected as participants.

Regardless of the faculty represented, participants for the short-term training were sought who:

- were fluent in English and could benefit from an intensive short-term program of instruction in English without further language training;

- were experienced and perceptive enough in teaching their disciplines to be conversant with critical educational issues, yet junior enough to have the promise of many years of their professional lives ahead of them; and

- indicated a commitment to working with their colleagues in solutions to their educational problems.

Some officials hoped that the Higher Education Training Institute might become a focal point for initiatives toward educational reform on the Ghiza campus. The policy was in place which required this training for new university faculty appointments, programs were being offered to junior instructors; but the facility for the training was

woefully inadequate andmedia equipment could not be provided there. Some participants in the Third Education Project saw the Higher Education Training Institute as the unit where participants in the Boston University counterpart training programs might extend the benefit of their training to others. But expectations regarding the physical location of resources and the focus of reform efforts on the main Ghiza campus were less clear than the commitment to reforms in the faculties of the health sciences at the Manyaal campus on Roda Island.

Finally, there were expectations regarding the roles which would be taken by those chosen to attend year-long academic programs at Boston University. In the planning phases the expectations were that those five participants who were selected for the long-term fellowship awards would assume major staff positions in the units which would lead the educational reforms--three in the Health Science Resource Center and two in the Higher Education Training Institute.

B. Faculty Participation

1. Cairo University and Boston University

A total of sixty faculty members from Cairo University attended specially designed, short-term training programs at Boston University, 34 of them at the Medical School and 26 at the Boston University School of Education. In addition, five Cairo University faculty members completed a full year of study in educational leadership at the Boston University School of Education, three of them on a post-doctoral basis. The Cairo faculty took courses in curriculum design, educational problem solving and systems analysis, media and technology, models of teaching, and educational measurement and research.

All of the 34 Cairo University faculty who participated in short-term programs at the Boston University School of Medicine were themselves members of the Cairo University Faculty of Medicine.

Of the 26 Cairo University faculty members who participated in the two-month summer programs at the Boston University School of Education:

9 were from Engineering;

2 were from Medicine;

2 were from Dentistry;

2 were from Agriculture;

2 were from Education;

2 were from Physical Therapy;

3 were from Pharmacy; and

3 were from other fields.

The five who studied at Boston University for a full academic year included three from medicine, one from veterinary medicine, and one from engineering. Four of these students received a Masters of Education degree from Boston University, and one is pursuing completion of a doctorate in education.

2. Boston University

Twelve members of the Boston University faculty of education and three from the Boston University School of Medicine provided classes for Cairo University faculty. One Boston University faculty member, the project director, visited Cairo University eleven times to assist in program planning and participant selection, to arrange short-term seminars, and to conduct interim and final program evaluations (in 1984 and 1987). Ten of the Boston University faculty provided two or more training days in Cairo and visited the University for participant selection or consulting services.

C. Curricula for the Short-Term Fellowship Programs

The 1982 summer fellowship program highlighted university program development and the application of media and technology to instruction. The fellows were introduced to the methods of studying organizations, of assessing needs within organizations, and to methods of problem solving within organizations. Concurrently, they were introduced to educational technologies, to principles of curriculum design and features of learning environments, to the use of methods and media for instruction, and to the planning and sequencing of instruction.

The curriculum for the summer of 1983 program had a different look. As a result of evaluations and specific requests from new participants and from the project director at Cairo University, the program planning and technology components of the previous summer's program were abbreviated to enable more substantial attention to two other components: university teaching methodology, and student evaluation techniques.

The 1983 summer program began with the use of problem-solving strategies for designing new curricula and media. Major topics included models of teaching and learning in higher education, designs for evaluating the effectiveness of a program and methods of assessing student performance within a program. The program also considered media selection and use. Each Cairo faculty member was asked to prepare a final project directed toward specific problems in their respective faculties using appropriate technology. At the end of the program, fellows presented their completed projects to their colleagues, instructors, and others involved in the planning, technical assistance and administration of the overall program.

Five short term fellowship programs were offered at the Boston University School of Medicine. Ten members of Cairo University Faculty of Medicine traveled to Boston in September, 1983 for the first of these two-month sessions. Subsequently, groups of six from the Cairo medical faculty traveled to Boston for two-month programs starting in September, 1984; November, 1984; January, 1985; and March, 1985.

The Boston University curriculum varied somewhat over the five programs. Instructional design, media services, preparation of slides, review of video tapes and use of other audiovisual aids were highlighted in all of the short-term programs at the BU Medical School. Instruction was provided through the B.U. Medical Media Services Center which enabled participants to prepare extensive sets of slides and other materials for their own use. Arrangements were made for the Cairo University medical faculty to meet with their counterparts at Boston University to visit classes, take part in hospital ward tours, participate in medical seminars, and inquire about other aspects of medical education at Boston University. Some of the groups addressed evaluation practice in higher education to a significant extent, while other groups had only a few sessions on the topic. Opportunities to study computer applications in teaching, learning, and administration of education also varied according to the availability of instructors and access to equipment.

IV. PROGRESS TOWARD EDUCATIONAL REFORMS

This section of the report presents the major educational reform priorities, activities and accomplishments of those Cairo faculty members who participated in the project. Separate sections will be devoted to each of the following units: the Faculty of Medicine; the Faculty of Engineering, the Faculty of Agriculture; and the Higher Education Training Institute. Finally, individual efforts will be documented.

A. The Faculty of Medicine

Substantial efforts were devoted to the construction, equipping, staffing and training for the new Medical Education Resources Center. Final construction was delayed for several years by contract disagreements, by financial problems, and by water damage, all of which were essentially solved during 1986 and 1987. Two floors were open and the other two were almost ready by November, 1987. The center was formally opened in January, 1988.

During 1987 the Center Director (and Vice Dean) became the Dean of the Faculty of Medicine. He appointed an acting director and also hired technicians to staff these facilities and services. The following technicians were on duty by November, 1987:

- 3 at the word processing and computer centers
- 3 at the television and videotape studio
- 1 at the photographics laboratory
- 1 at the printing presses

Plans include staffing an audio-visual library, especially for the storing and dissemination of slides and tapes intended for use in university instruction. Materials were purchased for the media library and nearly a score of videotapes had been made at the Cairo University Medical Schools and nearby hospitals and clinics. The media materials inventory included:

- 5000 slides purchased commercially, made abroad, copied at Cairo University, or produced on site;
- 60 videotapes purchased from abroad; and
- 19 films on medical education produced at Cairo University.

To build the resources of the medical media library, the Director of the Center sent letters to the Medical School Faculty asking each to schedule a time and topic of a lecture or presentation to be recorded on videotape. In addition, negotiations had begun to obtain copies of the slides owned or developed by individual members of the medical school facility.

Two additional groups had discovered the Center even during construction and had begun extensive use of the audio visual, printing, word processing, facilities:

a. Masters and doctoral students were using the Center to prepare the slides, statistical tables, and word processing text of their theses in both English and Arabic.

b. Undergraduate students in medicine formed an organization called the Students Scientific Society during 1986 and 1987 and made the Center its informal headquarters. They created a new publication, The Scientific Journal, in 1987 and printed 1000 copies on the Center's printing presses. They also scheduled two open meetings to view medical films and reported that more than one hundred students attended the films. At each presentation a faculty member was invited to answer questions about the medical procedures presented in the film. Another student initiative was arranging with professors of surgery and a computer company to have a presentation on why the computer is so important to medical education. The students reported these to be very worthwhile sessions.

The other major initiative of the Medical School in relation to the Third Education project was revision of the course examination system. The old policy was to give a midterm examination worth twenty percent of the final mark and to count the final essay examination as 80 percent of the mark. This resulted in considerable student tension and anxiety due to not knowing how well they were learning until the very conclusion of the year.

Several Cairo University medical departments have now changed this policy to allow for:

- a written exam each and every month;
- greater use of multiple choice questions which allow a broader range of concepts and skills to be measured;
- more extensive use of small groups in which to examine clinical and laboratory skills; and
- decreased emphasis on a final written exam, i.e. to no more than 60 percent of the mark.

One Egyptian leader at Cairo University commented: "If you want to change the curriculum, change the method of evaluation." And indeed the Faculty of Medicine has promoted increased attention to clinical skills, through curricular reforms and new examination policies consistent with the desired changes. In 1980, the six-year program was realigned from a 4-year versus 2-year distribution of coursework in basic versus clinical sciences to a 3-3 split. The faculty has noted that the more recent graduates demonstrate improved clinical skills.

Another curricular change instituted in 1980 and reinforced through examination content and grading is greater emphasis on community medicine, including academic study of communicable diseases but also clinical preparation for careers in primary health care. Other noteworthy curricular reforms include: incorporating English language studies as an official part of the medical education program; introducing the teaching of psychiatry as part of the core curriculum; and integrating teaching in the social sciences into medical study. The impetus for each of these reforms was the careful consideration of the kinds of knowledge, skills, values and insights medical graduates would need to serve effectively the greatest number of their countrymen.

The leaders in medical education have endorsed the notion that a critical mass of faculty members must be trained to bring about reforms and be encouraged to work cooperatively to effect change. They reported in November, 1988 that the new dean of the faculty of medicine is "very keen" on continuing the reform efforts and that he is actively seeking advice from graduates of the post-doctoral counterpart training programs at Boston University and elsewhere on how to incorporate new ideas into the curriculum. They reported that the "critical mass" has extended to become a majority of both the junior and senior faculty who support efforts toward change. As one put it: "Resistance from senior faculty has melted; at least 70 percent support change, especially with respect to methods of examination. Any new plans must address both junior and senior faculty."

B. The Faculty of Engineering

The priority for educational reform in the Cairo University School of Engineering has been a major revision of the Masters Degree including:

1. Creation of new interdisciplinary diploma programs in
   Energy
   Environmental Engineering
   Control (electrical, mechanical, chemical)
2. New course requirements in report-writing, use of computers, numerical analysis, and English language proficiency -- along with departmental specialties.

A central objective is the preparation of engineers who are ready to work on current technical problems and who can apply principles of basic engineering science to practice.

One professor of architectural engineering has introduced a course for undergraduates in applied behavioral sciences. His students must observe the flow of people in public places such as shopping centers or playgrounds, take numerous photographs, analyze the patterns of public behavior, and prepare an oral and written project on the implications of human science to an engineering or architectural design. This "human science" course with academic credit for a field project departs radically from the usual heavy emphasis on the formal end-of-year written exam. One objective in this course is to instill in the future practitioner a greater awareness of the human needs of the architectural client.

C. The Faculty of Agriculture

The Faculty of Agriculture sent two faculty members to Boston University and a third to Dundee for fellowship training. All three have joint appointments at the Ghiza and Fayoum campuses of Cairo University Faculty of Agriculture. Together they have initiated a major reform of the core curriculum of the faculty of agriculture, Fayoum Campus. Theirs is an unprecedented effort to plan and execute a comprehensive program of classroom and field training. Joining with four additional colleagues, they have developed seven highly innovative courses: chemistry, botany, and organic chemistry at the freshman level; and genetics, soil science, entomology, and micro-biology at the sophomore level.

Their course modules are designed to promote student mastery of important knowledge, higher order thinking, and skillful performance in the laboratory and field settings. They have also designed teaching manuals, student workbooks, slides, video tapes, transparencies, and other visual aids as part of their model curricula. The three professors have fostered a collegial training plan for implementation of the new curriculum in the classroom, in the laboratory, and in the field.

D. Higher Education Training Institute

The Training Institute now has four full-time faculty, drawn from the ranks of senior faculty, who are experienced and knowledgeable about the theories of student learning, curriculum design, teaching strategies and student evaluation. The Dean of Education, at Cairo University's Fayoum Campus, a former UNESCO expert, supervises this Institute in addition to his other duties.

Part-time faculty are borrowed from other faculties to teach some of the practical applications to specific fields of study such as medicine, engineering or agriculture. One of these is a microbiologist who has studied at both Boston University and Dundee, teaches at both Cairo and Fayoum campuses, trains new faculty instructors while working with his colleagues on curriculum revision at Fayoum. Others include faculty members from dentistry, nursing and psychology who are also noted for their excellence in teaching.

E. Individual Efforts

As reported, during the 1984 and 1987 evaluation visits by Boston University faculty to Cairo University, participants were able to describe changes in educational practices which they were attempting in their own classes. Some of the changes they attempted were very ambitious, with the potential of affecting an entire department or total faculty. Examples of the new educational practices attempted by individuals upon their return from fellowship training at Boston University are grouped below under the heading of teaching methodology, curriculum development, and evaluation. Several examples of the application of educational technology were also reported but each of these are included under one of the other three headings.

1. Teaching methodology

Efforts at implementing new teaching strategies tended to be limited to a faculty member's own classroom practices. Among the responses reported were:

- incorporating slides into lectures to illustrate specimens and techniques more clearly to the students (who often have limited access to text-books or other illustrative materials);

- modeling one's teaching after specific effective teaching practices they admired;

- pausing after questioning students to promote more thinking;

- preparing and distributing outlines of a lecture and references to students so they could follow a lecture more closely;

- leading a discussion according to principles and practices learned during counterpart training; and

- using praise to promote more student response in what are typically very passive classes for students.

Two Cairo University professors were attempting to influence changes in teaching practices on a wider scale. One member of the Faculty of Medicine had begun to provide microteaching sessions for her junior assistants. Another member of the Faculty of Dentistry was designing a continuing education program for army dentists to be implemented during the summer months. The program incorporated many of the design features and teaching strategies experienced in Boston.

2. Curriculum: Reports of efforts at curriculum changes ranged from development of individual units within courses to the review of entire programs of professional preparation. Almost all of the efforts involved collaboration on the part of the Boston University fellowship participants with other Cairo University colleagues who had not been part of the Boston program. The following examples are listed to illustrate the range of attempts at curriculum development and change:

- A member of the Faculty of Engineering incorporated mastery learning and unit planning methods for a course he is co-teaching in biomedical engineering. Several other fellowship participants also report similar efforts to revising courses or parts of courses they are presently responsible for teaching with departmental colleagues.

- Another member of the Faculty of Engineering related how the program planning and analysis techniques he learned in Boston encourages him to respond to the problem that new graduates are unprepared to meet some of the demands of industry. In particular, he noted that skills in feasibility analysis were important to engineering consultants. He is introducing a unit on the topic in one of the fourth-year courses.

- Three fellowship participants from different professional fields (agriculture, engineering, and psychology) joined in planning and delivering in-service training for employees of a Public Information Center who give health and nutrition classes to citizens. (However, since the Ministry of Information was unable to fund further development of the program, this training program was discontinued.)

- A fellowship participant from the Faculty of Medicine translated a portion of the medical education curriculum for nursing students from English into Arabic and revised the curriculum in light of the results of a pretest showing gaps in prior knowledge. She stated that the experience in the fellowship program was a major factor in this curriculum revision.

- A member of the Faculty of Pharmacy reported that, after the summer workshop, she tried to change an area of the curriculum in response to criticisms from industry regarding the level of skills of graduates. H - efforts with a colleague resulted in a new course which was tried and well received by students during the fall semester.

3. Evaluation

The portion of the summer fellowship program devoted to examination of issues and techniques for student, faculty, and program evaluation was very well received by the Cairo University fellowship participants. All of the fellows had expressed the need to improve evaluation practices in their faculties at Cairo University. Furthermore, all the fellowship participants reported that they found the ideas and experiences from the summer workshop on evaluation practices very appealing and useful. [A few junior professors in certain departments indicated that only department chairmen or senior professors wrote the questions for final exams. And in some of these cases, the fellowship participants had no opportunity to evaluate propc .y what he/she had taught.]

Regarding the application of new evaluation practices, some said that they intend to try the ideas, but it was "too early to tell." Many more cited specific practices they were already trying:

- developing checklists and rating scales for appraisals of clinical performance rather than using global or general evaluations;

- using more frequent evaluations in order to give students feedback on how well they are doing in a course;

- preparing examination questions in light of the course objectives and not simply the content in mind;

- indicating to students the point value or the amount of time they should allocate to each question on an essay examination; and

- using objective test items to evaluate student performance (in a department which had historically used only formal essay examinations).

All of the curriculum development efforts reported earlier included plans for developing test items and clinical assessments as part of the packages. Two of the fellowship participants had attempted course evaluations as well, both using questionnaires administered to students.

The results were mixed. One reported that the course evaluation survey was the first experience of its kind for the students. "They were astonished," the faculty members said. The other participant reported gaining information from the student which she found "extremely useful" for improving her course in oral surgery. While students praised her for stimulating their contributions to class discussion, they suggested that the pace of instruction on certain units was too rapid. The questionnaire also documented the students' need for more educational media, laboratory, and clinical experience to be able to understand certain skills and procedure. "I can't imagine the surgical procedure only from an oral description." This documentation made a compelling case for greater access to media services in the Faculty of Oral and Dental Medicine, and prompted her colleagues to examine the course sequence with the view toward organizing the content differently. Actually the persistent need for visual resources to aid instruction has been discussed extensively by Cairo University faculty and other Egyptian educators.

V. RECOMMENDATIONS

The initiatives and impact of counterpart training represent a strong commitment to improving instruction at Egyptian universities. Many of the recommendations for reform of higher education in Egypt summarized below have also been made by Egyptian educational leaders themselves.

The first set of recommendations includes actions that might be taken within Egypt -- by officials at Cairo University, the Supreme Council of Universities, and/or the Egyptian Ministry of Education. The second set identifies types of support for higher education and national development through education which should be considered with Egypt by international development agencies.

A. Recommendations to Egyptian Educational Leaders

1. Promote the use of the health education resources center.

Early in 1988 the Center formally opened. All that remained to be done was the furnishing and appropriate staffing of an audio-visual materials library (with almost 5000 slides, films and tapes) and clarification of the staffing and administrative roles and responsibilities at the Center. For example, the administrative direction of the facility must include established members of the faculty who have earned the doctorate and who have included audio-visual methods into their own teaching, as well as younger faculty with advanced training in curriculum design and instructional technology. Both types of leadership will be important and both, because of the Third Education Project, are available.

a. Faculty Use To promote the use of the Center by faculty members, it is recommended that Cairo University form a council of one or more faculty member from each department. Their role will be to suggest ways that the Center can help their departments as part of a longer effort to modernize their academic programs. This council should issue frequent reports, at least twice a year, on both faculty production (i.e., of slides and tapes) and on departmental utilization of the Center and materials. This type of documentation and self-evaluation will provide one of the most effective and appropriate measures of progress, and it will also publicize the center's success, promoting even further use.

b. Student Use The promotion of student use of the Center will be much easier. Their presence is already felt throughout the facility. Groups of students should be given tours of the Center, including a chance to view a film or to request a videotape. The more advanced masters and doctoral students should be given priority to use the facility because the Center offers so much that will help them:

1. production of slides and graphics needed in their masters, thesis or doctoral dissertation

2. advice or statistical design and analysis of research data

3. assistance with word processing and the physical production of papers in English and Arabic

But use by upper level undergraduate students should also be possible. The fifth year students in the Students Scientific Society should be asked to help organize, schedule and assist with orientation tours because of their favorable experience in using the Center facilities during 1987. Their assistance in publicizing the Center resources among other students will be quite valuable.

2. Establish differential rates for instructional versus commercial use of the Center's equipment and facilities.

Several faculty and graduate students reported that one deterrent to greater use of the Center will be the charging of fees for each photograph, or slide or other service. Eliminating any fee would be a problem because the laws and bylaws governing the universities state that the centers must be self supporting. It may be possible to subsidize lower fees for items to be used in instruction with higher charges for items and services provided for individual or commercial use.

Other revenue generating policies should be considered to provide support for instructional use of the facility. Possibly the Cairo University films and slides produced could be sold to other universities in the Middle East and Africa to help defray the cost of production. The Center could promote use of its resources by advertising its new programs, projects, and media in the newsletter it produces every three to six months.

Fees charged for photographs for individual use or sales can be justified. Possibly the Cairo University films and slides produced could be sold to other universities in the Middle East and Africa to help defray the cost of production.

3. Use the audiovisual library to reduce reliance on private tutoring.

Even the best medical students feel great pressure to enroll in private tutoring courses to review course outlines and medical content in greater depth than is possible in the large lecture courses. This is especially true in courses such as anatomy, surgery, and internal medicine. Although tuition is free at the medical school, private tutoring can cost 300, 500, even 1000 Egyptian pounds per course. This is, of course, an important source of income for certain faculty, but only the more affluent students can afford these extra charges.

Cairo University officials discourage private tutoring . t the heavy reliance on course outlines, memorization of many details, and end of year essays create pressures which result in the continued popularity of informal tutoring classes. One way to reduce the pressure for outside tutoring is to encourage students to view the films and videotapes on the various specialties within biology and medicine. Students themselves, with a minimum of faculty guidance, could organize these supplementary sessions which might be available free of charge at the Center.

4. Extend use of the center to the faculties of dentistry, veterinary medicine, pharmacy, and physical therapy.

One resource center of this type should suffice for the several health schools all located at the Manyaal campus on Roda Island. Although the medical school has provided the vision for improving instruction, the need is pervasive. By 1990 the Center should develop into a Health Education Resources Center. Prospective nurses, dentists, and various therapist and health technicians would benefit greatly from seeing during instruction the organisms, cultures, organs and diseases they will treat. The faculty in medicine may continue to be the major users of the Center, but the resource might be shared with other Cairo University faculties especially in the other medical and health sciences. The deans, department leaders and faculty of these schools want to be consulted and participate in decisions on the use, staffing and budget of the Center.

5. Plan for educational resource centers at Ghiza and Fayoum.

The other campus centers of Cairo University also need access to their own instructional technology resources. Most of Cairo University's 130,000 students attend the Ghiza campus, in the Faculties of Engineering, Commerce, Law, Arts, Agriculture and other major schools. The Fayoum campus includes a school of education and of agriculture. Students and faculties will not travel often to a different campus or inaccessible location to use the resource center.

An education resource center at Ghiza and a center at Fayoum need not be as large as the Medical (Health Sciences) Resource Center but might be located in close physical proximity to the classroom, lecture halls and laboratories where the instructional materials will be used. Although a new building might be desirable at each location, the refurbishing and redesign of an existing facility would be quicker and less expensive. Two or more rooms should be available for production, one large room for a materials library, one for consultation and one for viewing videotapes of one's own teaching. Location and design of the Ghiza facility should be done in coordination with plans for continued development of the Higher Education Training Institute. The Institute might house the Center and satellites could be located in the larger schools for ready access to equipment by faculty members.

6. Develop a plan for increased use of computers.

During the 1970's the computer became an increasingly important tool for conducting research and for making basic decisions in finance, government, engineering, medicine and even law and music. The computer is so powerful a tool for storing, retrieving and processing information that some experts feel it already rivals in importance the invention of the printing press.

During the 1980's the computer has revolutionized the potential for learning in every nation in the world. Cairo University officials have recognized this and have authorized the purchase of both mainframes and microcomputers. What is needed next is a five-year plan to expand the use of computers for education in medical, engineering, commerce, agriculture and other technical fields.

For some years to come it may be unrealistic to provide a computer to every faculty member and student. Instead, it may be appropriate to arrange for computer libraries and terminals within education resource centers. The Medical Center has contracted with a computer company to provide computer maintenance services -- an excellent first step.

The Ministry of Education has seriously proposed making computer courses a mandatory component in Egyptian secondary schools. As this occurs, the Universities will receive new students already accustomed to using computers as a learning tool, for writing, and as a way of solving technical and mathematical problems. By the 1990's each faculty of the university could have in place a plan for incorporating the computer into the teaching, course work, research and learning strategy of each degree program and specialty.

7. Expand the use of the Higher Education Training Institute.

Cairo University has shown tremendous leadership in establishing the requirement that new instructors and lecturers receive both theoretical and practical training in the art and science of university instruction. Elsewhere in the world large universities often ignore this need; their students suffer from instruction that is inadequate and lose the benefits associated with the use of technology and the corrective feedback from frequent and varied forms of evaluation.

The large classes and consequent heavy instructional load of Cairo University make even more urgent the need for faculty to use the media effectively and to modernize the instruction and evaluation of University students. Although new faculty receive introductory training in intensive three week sessions, several needs remain:

a. intermediate or advanced courses to be scheduled for all faculty members in the design of new programs, instructional media, and evaluation systems;

b. efforts to assist more senior faculty in acquiring basic evaluation and media skills;

c. a chance for faculty members to practice their lessons or lectures before video camera and to allow or invite others to provide constructive suggestions on how to improve their presentation; and

d. an opportunity to consult with experts on proposed new courses or revisions, and to obtain help on evaluations.

Cairo University now has expert faculty members who can provide intermediate and advanced classes because of faculty participation in programs at Boston University, Dundee and elsewhere. In addition, faculty from Boston University and other universities can be helpful as guest lecturers, demonstrators and consultants and could be of use in special seminars and workshops for the senior faculty. The Higher Education Training Institute could be an effective forum for this consultation.

8. Reduce reliance on rote memory and emphasize instruction for problem solving.

In the year 2000, and even now, professionals should not be expected to hold vast bodies of information in their heads but to print references and computers for retrieving or evaluating information to solve problems. University instruction should promote the application of general principles and concepts to a series of problems which can be solved by reasoning and diligent searches for the relevant information.

Professional schools and faculty at Cairo University could be encouraged in their efforts to develop academic programs which provide:

a. a clearer focus on problem-solving and higher order thinking skills such as diagnosis, prescription, and creativity;

b. more field work and laboratory work to witness and try first hand applications of the phenomena and concepts being taught; and

c. evaluation of students based less on rote learning and more on the mastery of important learning outcomes.

Several faculties have begun to revise the curriculum for one or two years of study, or for an entire department, or for an entire degree program. These efforts must continue in each faculty. The Dean of each school might ask for a five year cycle of curriculum redesign towards the goal of reducing emphasis on rote memory.

9. Criteria for promotion of University faculty should include evidence of teaching effectiveness.

Twice during the course of the Third Education Project, public statements were issued by the President of Cairo University indicating that promotions of faculty to higher ranks, especially to assistant professor or professor, should include documentation of effective teaching as well as scholarly research. However, there is a tradition of promoting faculty on the basis of their scholarly publications and research competence without regard attention to teaching performance or competence.

The deans and presidents might require that those faculty preparing for promotion to a higher rank submit evidence not only of their research but of their instructional performance including:

a. an outline of the courses taught
b. examples of slides, tapes or other media developed for use in the class
c. sample examinations including monthly as well as final exam questions
d. examples of student projects or papers or other creative problem solving techniques.

A faculty review panel, including newer faculty who have had recent and advanced evaluation training, could assess the instructional strategies of their colleagues as to their appropriateness, level of skill, and effective impact.

Presently, candidates for promotion in the medical faculty must present their research to a panel of 25; several leaders are convinced that candidates should have to present their teaching credentials in a similar fashion, and that both components be part of the law governing promotions.

10. Continued use of short and long term study aboard.

The Third Education Project has demonstrated the usefulness of professional travel for faculty to study in another nation. Such study should continue to be supported for two purposes:

a. to increase one's competence in a scholarly field as a specialist, researcher and academic expert, and
b. to expand one's competence as a teaching professor by acquiring state-of-the-art competence in instructional technology, course design and evaluation systems.

Blending the two purposes is, however desirable, usually not possible nor likely. Cairo University has been able to differentiate these useful options in the past and should continue to do so in the design of future programs.

11. Cairo University should send teams of faculty abroad

One of the most effective strategies for faculty development at Cairo University was sending not one professor but pairs or teams of faculty abroad for advanced studies. The teams, especially if they came from the same faculty or departments, not only studied together but upon return to Egypt often worked together on curriculum and instructional reforms.

Conversely, when only one member of a department was trained other faculty members could more easily ignore the individual efforts. A "critical mass" is important for collaborative efforts to reform a program.

Groups of six to twelve faculty members with two or more from each department, were especially cohesive and mutually supportive upon their return to Cairo University. These numbers of faculty should be assigned to the same counterpart University at one time, with the option of different teams each summer — until all major schools and departments are adequately served.

This recommendation will be addressed to international development agencies as well. It is recognized that the Egyptian universities presently do not have the resources to finance this highly effective practice. In tne words of a former president of Cairo University, "We want very much to send staff members abroad but financing is a problem."

12. Expand the liberal arts education component of each school.

Cairo University offers undergraduate degree programs of sufficient length and of extensive coverage of very technical subjects. But Cairo University is preparing not only an engineer or a medical doctor but a citizen of the nation and of the world, a future leader in professional or national matters. Unfortunately, to outside observers the education of able future practitioners seems for the most part very narrow, technical and specialized. Too little opportunity exists for broader studies outside one's pre-professional studies. The convention for the Reform of Higher Education in Egypt will propose some useful guidelines.

Some hope for consideration of broader issues can be found in recent changes in the medical education curriculum: requiring academic and clinical training in community medicine of all students; incorporating the study of the social sciences into the core curriculum for medical education.

But, to date it appears that support for the liberal arts in professional education at Cairo University is losing ground. The Engineering school once required some liberal arts courses, but not as of 1987. Despite the feeling held by engineering faculties everywhere that there is never enough time for all the important technical details, engineering students need to include in their education general education including a variety of ideas about the human condition.

The precise definition of a liberal arts education is a matter for genuine debate but generally includes systematic study of:

a. humanities -- history, literature, art, music and religion;

b. the social sciences -- economics, sociology, psychology, political science, anthropology, in short the human sciences;

c. the natural sciences including chemistry, biology, physics, geology, astronomy -- subjects frequently required at Cairo University especially in the first two years.

Egyptians will continue to debate the desirable mixture of these ingredients. The academics of Britain and America in each decade continue to argue about the nature of liberal arts education, the proper mixture of a core curriculum, and what "great books" should be read by persons of culture. What is important, however, is that the university education of an Egyptian professional include the study of the larger civilization, of great ideas and of more than one tradition of inquiry.

13. Conduct institutional research.

Cairo University should design and conduct institutional research on the nature, extent, and outcomes of educational reforms which are being attempted at the university. This includes monitoring the extent to which media and technology are used in instruction as well as changes in the frequency and format of examinations, but also more pervasive changes in the academic programs as well.

Cohort analyses might be done to gauge the effectiveness of new curricula on improving the skills of students on tasks of complex problem solving and field, clinical, and laboratory skills. Implementation of the new core curriculum for the faculty of Agriculture at Fayoum presents an optimal situation for testing the real benefits of investing in training for educational reforms. In studying the effectiveness of its own programs, Cairo University will be able to offer curriculum materials and academic practices of proven effectiveness to other institutions of higher education in Egypt and the Arab world.

14. Offer assistance to other universities.

Cairo University holds an important leadership role in Egyptian education and in the Arab world. The deans and faculty from other universities might be invited to conferences at the Health Education Resources Center. There they should be able to witness new techniques in practice, order audio visual materials; and acquire the course syllabus and examination formats which can serve as models for their own efforts at educational reform. Fortunately, the Egyptian tradition of using outside examiners and the reliance on conferences as a device for discussing reform will make easier the implementation of this recommendation.

15. Increase the pay of faculty.

Instructors and professors are paid too little. As the number of students drops according to plan, the need for new faculty will lessen, some positions may be eliminated, and the wages might be increased.

Some faculty now cope with the problem of inadequate pay by taking on assignments in other Arab nations. Both Egypt and other countries have benefited. However, this solution is not a permanent one, as oil revenues decline and these other nations develop their own institutions and resources for higher education. The other source of income is private tutoring, but this practice favors those students who can afford the payments. To eliminate such tutoring requires greater use of the technology (see recommendation #3) and higher pay scales for each institution.

B. Recommendation to International Agencies

A second set of recommendations is offered to the World Bank and to other external agencies including the United States Agency for International Development, the World Health Organization, and others which might continue to support higher education reforms proposed by Egyptian leaders. Some of these could be part of the five year plan and the Fourth Education Project.

1. Continue support of higher education facilities, equipment, and faculty training.

The older and larger Egyptian universities are overcrowded and need modern facilities to use instructional technology and modern media. New buildings as well as reconstructed buildings will require provision for films, slides and for the extensive use of computers as well as the construction of mediated classroom environments. Many Egyptian faculty members have acquired or will soon acquire personal computers and software for their own use. Cairo in 1987 was fully aware of the powerful applications of computers and the Ministry of Education was eager to promote the use of technology in the secondary schools.

Much more difficult is the training or re-orientation of more senior faculty who respect the lecture method as the traditional instructional tool and who may lack the time, inclination or expertise to learn new teaching technologies. Even more complex is the task of finding leaders in each department who will examine existing courses, eliminate duplication and overlap, set new goals of teaching critical thinking and creative problem-solving, design new laboratory or field projects, and provide for more frequent and varied forms of student evaluation. But investment in advanced faculty studies in education reform will continue to be crucial in making new facilities work, to modernize Egyptian higher education, and to achieve a greater quality of educational performance. New instructional methods will lead to better overall economic development and societal reform.

2. Provide funds to send teams of faculty abroad.

What worked very effectively for Cairo University during the 1980's was

to send teams of faculty abroad so that they could study new techniques together at Boston University or elsewhere, return, and cooperate in the development of new programs, courses and techniques. Several departments within medicine, including dermatology and microbiology, and the faculty in agriculture at Fayoum, clearly benefited from the team approach as measured by the quality and numbers of courses redesigned and the extent to which instruction has been enriched by visual techniques. Those faculty sent alone, if they were senior enough, were able to redesign their own courses but lacked their colleagues' understanding and strong support as enjoyed by those faculties with two, five or as many as ten who studied abroad.

3. Establish linkages between pairs of universities in Egypt and abroad.

The World Bank - I.D.A. Third Education Project combined the talents of Cairo University and Boston University, two large universities with faculties in medicine, nursing, dentistry, physical therapy, law, engineering, business or commerce, as well as education. This proved to be a productive match.

More than a dozen faculty members from Boston University visited Cairo in addition to teaching and advising Cairo University faculty members at Boston University during the regular academic term and in special summer courses. The exchanges were extremely important to support, further define, and follow up on what had been taught in Boston and Cairo.

Also important was provision for a team of Boston University educators, some with expertise in teaching and learning, in media and technology, others in course design, research, and evaluation techniques. Occasionally one university faculty member can provide an important contribution to another nation or university. But to make an impact, it is important to design more comprehensive university linkages to address complex issues of educational reform over long periods of time.

4. Assist universities in manpower planning.

The issues of matching higher education to employment needs and manpower requirements is challenging to any nation with a stable population, but exceptionally difficult in a nation which grew from 30 million to 50 million persons in the 1980's and could grow to 70 million persons during the 1990's. Egyptian officials have taken the first steps to prepare new plans and productive reforms.

One problem is the overall production of doctors, and engineers, and other professionals. Another is the distribution of practitioners within a profession -- enough doctors for rural areas, for example, or fewer architectural engineers but more electrical engineers. Still another challenge is the production of technicians and technical personnel in general.

Each five year development plan will need expert advice, and national and international agencies should continue to supply technical assistance and advice as regulated to manpower and educational ministries. Some of the assistance should be made available to universities who are central to the production of well-educated manpower.

5. Expand the modernization efforts to other universities.

Those instructional reforms that have begun to work for Cairo University might be made available to the newer, provincial universities. Cairo University is the mother campus, but more than two thirds of all Egyptian university students attend other universities. Many of their faculties will have been educated at Cairo University, but their universities also need modernization and reform of instruction, courses and evaluation systems. Their faculties can either study abroad, or learn of new practices at Cairo University, or -- for some individuals -- both. The other university faculties should be encouraged to submit proposals building on the experience of the Third Education Project to achieve progress comparable to that expected at Cairo University.

6. Invest in and use the schools of education to support modernization.

An important priority of Egyptian faculties in education has been the preparation of teachers for the primary, preparatory and secondary schools. What's more, these are the vital feeder systems which supply students to higher education. The Egyptian efforts to expand literacy are substantial and significant. The Egyptian-U.S. decision to construct two hundred new elementary schools a year, with U.S A.I.D. support, is especially noteworthy. However, three relatively new initiatives should also be mentioned:

a. the decision to use university schools of education to prepare primary school teachers as well as intermediate school teachers.

b. the appointment of the Cairo University Dean of Education as Director of the Higher Education Training Institute, along with the provision of full time staff and the use of part time specialists in other departments to train university faculty in modern teaching methods.

c. the creation of an Institute of Educational Studies and Research, which could become a graduate school or Institute of Education capable of evaluating and assisting educational reforms at all levels.

In future educational development projects, the faculties of education at Cairo University, Ain Shams and elsewhere should be included not only to strengthen teacher preparation for the schools, but to assist in university faculty preparation to help other faculties and departments, and to conduct research and evaluation studies of the overall modernization efforts. The Faculty of Education at Cairo University demonstrated a willingness to expand the reform efforts and its faculty members should be considered useful participants in future projects.

VI. CONCLUSION

This report documents specific contributions of counterpart training b 'ween Cairo and Boston University. Between 1981 and 1987 Cairo University and other Egyptian universities began to reduce admissions in overcrowded fields and to revise the courses of study. A central strategy was to improve both the initial preparation and advanced study by university faculty in the methods needed to improve University instruction and student evaluation. The World Bank -- IDA provided significant resources to support the modernization of Egyptian higher education. Continued efforts and financial support will be important to sustain the momentum for educational reform.