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Indicators of Progress in the Jordanian Educational Reform A discussion paper

Prepared for the
National Center for Educational Research and Development

by

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May, 1990

SUMMARY:

This discussion paper suggests indicators that may be useful in evaluating the Educational Reform now underway in Jordan. Part One provides an overview of the Educational Reform. Part Two discusses the purpose of evaluation, suggests a general model of the Educational Reform that can be used in designing an evaluation, and identifies a set of indicators for each stage of the model. Part Three examines the extent to which data that address these indicators are already available within the present education management information system. Part Four proposes an agenda for evaluating progress on the Reform by suggesting fourteen of the most important studies that need to be conducted, what data those studies would require, and a proposed timetable for their completion. More detailed protocol for three of those studies are provided to illustrate the types of planning, logistics, and instrument development needed in planning evaluation activities.

Indicators of Progress in the Jordanian Educational Reform

A discussion paper

EXECUTIVE SUMMARY

In 1985, the Government of Jordan launched a major national Educational Reform, one goal of which is to raise the quality and efficiency of basic and secondary education. To help ensure the success of the Reform, the National Center for Educational Research and Development (NCERD) was created in 1988 and charged with evaluating progress of the Reform. This paper suggests indicators that might be used by NCERD in evaluating that progress.

Part One of the paper provides an overview of the Educational Reform. Part Two discusses the purpose of evaluation, suggests a general model of the Educational Reform that can be used in designing an evaluation, and identifies relevant indicators for each stage of the model. Part Three examines the extent to which data that address these indicators are already available within the present education management information system maintained by various units of the Ministry of Education. Finally, Part Four proposes an agenda for evaluating progress on the Reform by suggesting fourteen of the most important studies that need to be conducted, what data those studies would require, and a proposed timetable for their completion. More detailed protocol for three of those studies are provided to illustrate the types of planning, logistics, and instrument development that will be needed in planning evaluation activities.

Indicators of Progress

A model of the educational process is proposed which describes the educational process in terms of inputs, process, outputs, and outcomes of education. Indicators are organized within those categories.

The intention of the Educational Reform is to change the outputs and outcomes of education by changing the inputs and processes of basic, secondary, vocational, and teacher education. The expectation is that the efficiency of the education system will be increased, not so much by improving student flow through the system or by reducing costs, but through increasing educational quality. Student flow statistics in Jordan are already quite favorable--participation is almost universal and attrition and repetition rates are low. Likewise, due to MOE regulations, there is little teacher turnover. It is unlikely that the

reform will improve these indicators. Similarly, recurrent costs of education may increase during the Reform. For example, as teachers are required to have more years of education, the salary budget will go up. The expectation is that increased student learning will more than offset the increased cost.

Under the Reform, then, efficiency of the education system will increase only as the quality of education increases. The most relevant indicators of progress, then, are those concerned with the extent that the Reform activities are actually implemented and those concerned with the quality of the education students receive.

Availability of Data

The MOE and related agencies already collect a substantial amount of quantitative data about inputs which can be used to monitor progress of the Reform. Comparable types of input data across several years (e.g., numbers of students, teachers, buildings, books, etc) can be used to identify trends and develop projections that can be helpful in guiding resources allocation and implementation decisions associated with the Reform.

Little if any process data currently are collected. Output data are limited, consisting mostly of student attainment scores on the national examinations in the 9th and 12th grades. Outcome data are not explicitly collected by the MOE, though some types of data relevant to assessing outcomes are available from other ministries, such as economic indicators and employment statistics. Data that are presently collected by the MOE are described in the full paper. Progress is now being made within NCERD to link these data sets to allow for more complete analysis. Data in the present EMIS will be most helpful in planning for and monitoring implementation of the reform. Additional data on processes and outputs of education will need to be collected.

Evaluating Progress of the Reform

Based on the larger list of indicators, fourteen specific studies are suggested as particularly important for evaluating progress of the Reform. These are organized into four groupings: monitoring studies, baseline studies, evaluation studies, and applied research studies.

In early stages of implementation, careful attention to monitoring the flow and distribution of inputs is more important than assessing outcomes. Without proper distribution of inputs, the Reform cannot be properly implemented and, without proper implementation, it is unlikely that the goals of the Reform will be achieved. A series of

specific monitoring studies that can help provide these data are suggested. At the same time, baseline information must be collected to allow for comparisons that will need to be made several years from now. In some cases, new data need to be collected, for example, information on the current pedagogical practices of teachers. In other cases, the necessary data are already collected and need to be properly archived.

While four evaluation studies are proposed, particular emphasis is given to the evaluation of the new textbooks now being prepared and the teacher training about to be offered. Textbooks and teacher training both are seen as crucial to translating the general goals of the Reform into specific classroom practice and represent the most direct means for raising student achievement. Finally, the paper suggests several areas in which NCERD might undertake applied educational research, particularly as such research can help identify the teacher and school factors that relate most strongly to educational efficiency.

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Introduction

The Hashimite Kingdom of Jordan has a long-standing commitment to human resources development through the provision of quality education and appropriate training. Over the last two decades, the country has undertaken a rapid expansion of its education system. Between 1978 and 1988, primary enrollments alone grew by 34 percent. One result is an educational system that currently reaches over 98 percent of school-age children up to the age of 12 and 80 percent of the 12-18 age group. The country has one of the highest rates of higher educational participation in the world. Adult literacy is over 80 percent, up from only 30 percent in 1960.

While these gains are impressive, they have come at a cost. The rapid quantitative expansion in education was at the expense of quality. Recognizing this, the government, in 1985, launched a major national Educational Reform initiative, one goal of which is to raise the quality of basic and secondary education. This, in turn, is intended to provide the manpower base which Jordan needs to develop its domestic technological capacity and maintain its comparative advantage in the region's labor markets. This goal has been translated into a ten year Plan of Action which identifies a series of specific policy interventions and structural changes designed to enhance student achievement levels and improve overall efficiency of the education system.

To help ensure success of the Reform, the Government of Jordan (GOJ) is now establishing an ongoing program of evaluation. As a first step, it created the National Center for Educational Research and Development and charged it with (among other

things) monitoring implementation of the Reform and evaluating the success of those Reform activities, once implemented.

The purpose of this discussion paper is to suggest indicators that may be useful in evaluating the Educational Reform now underway. The paper is organized in four parts. Part One provides an overview of the Educational Reform. Part Two discusses the purpose of evaluation, suggests a general model of the Educational Reform that can be used in designing an evaluation, and identifies a set of indicators for each stage of the model. Part Three examines the extent to which data that address these indicators are already available within the present education management information system maintained by various units of the Ministry of Education. Part Four proposes an agenda for evaluating progress on the Reform by suggesting fourteen of the most important studies that need to be conducted, what data those studies would require, and a proposed timetable for their completion.

Part One: The Educational Reform

Structure of the education system

Prior to the Reform, public pre-university education comprised three levels: (1) an elementary cycle of six years; (2) a preparatory cycle of three years capped by a national examination; and (3) a three year secondary cycle also culminating in a national examination. Elementary and preparatory students received a single national curriculum, while secondary cycle students were streamed into one of several academic (arts or sciences) or technical (industrial, commercial, agricultural, hotel, or nursing) curricular tracks or referred to a Vocational Training Center for further training. Promotion from the elementary to the preparatory cycle was based on class performance and school grades, while promotion and streaming from preparatory to secondary depended on national examination results, the student's rank-ordered choices for secondary specialization, place of residence, and the availability of the desired specialization in the student's residential area.

Under the Reform structure, initiated in the 1989-90 academic year, elementary and preparatory cycles have been combined into a single level of "basic" compulsory education and extended from a total of nine to ten years, while secondary education has been reduced to two years. The national examination at the end of the preparatory cycle has been replaced by class performance and school grades in the determination of promotion and specialization in secondary school. The secondary cycle has also added a few technical specializations, and the National General examination at the end of secondary school will no longer govern graduation, but only entrance into higher education.

The Jordanian educational system no longer has any formal examinations as part of the basic and secondary educational cycles. Previously, students were examined in all subjects in their specialization at the end of grade twelve. Students who did not pass the examination did not receive a secondary school degree. Under the Reform program, secondary school completers will receive their degree even if they do not pass the examination. While passing the examinations is still a prerequisite for admission to higher education, students have the option to spread their examinations over two years, choosing which subjects they would like to sit for in the first year, and taking the remainder as well as any failed first-year subjects the following year. As of 1993-94, students may be given three years to achieve passing marks in all subjects.

Overview of Educational Reform

The educational Reform has two main objectives. The first is to enhance student achievement levels as a means of improving both the internal and external efficiency of the education system. The second is to institutionalize the capacity to sustain sectoral reform. The following outline summarizes the key policy and structural changes of the Reform:

Goal 1: Enhance Student Achievement

1. Restructure the school system

An Education Law, enacted in 1988 and implemented in the 1988-89 school year, extended basic (compulsory) education from nine to ten years and reduced secondary education from three to two years. It also revised the streaming structure to provide three major streams--science/math, arts/ humanities, and technical/technology. Additionally, it called for expanding the intake capacity of vocational training centers and for broadening the specializations offered.

2. Revise the examination system to assess student achievement levels against longer-term performance and areas of specialization.

The new Education Law replaced the basic education completion examination with a new system of promotion from the tenth grade to secondary education (11th grade) based on performance in the previous three grades and replaced the General Secondary Examination with a new system of specialized examinations in line with the streaming structure. The new basic to secondary promotion system will be fully operational by the 1991-92 school year; the new examinations at the end of secondary school will be implemented in June 1994.

3. Use sector resources more efficiently and increase cost recovery levels.

4. Improve the quality of teaching and learning.

This will involve revision of basic and secondary education curricula and development of new instructional materials intended to develop higher cognitive skills and abilities, reflect up-to-date pedagogy and contemporary issues, and address individual learning abilities and interests. National Curriculum Committees have already been established for each subject. The new curriculum for secondary schools will be introduced in grades 11 and 12 in the 1992-93 school year.

5. Textbook Development

Textbooks and learning materials that are designed to support curricular objectives and to be instructionally more effective are now under development. The plan is to develop, publish and introduce new textbooks in math, science, English, social sciences, Islamic studies and Arabic in six of the ten basic education grades (for about 400,000 students). The new materials will be developed, pilot tested, and phased in on a rolling basis, described in Annex B. Publication will be done by a newly created Textbook Publications Unit, which has been set up in the MOE. The MOE will also improve the national textbook storage and distribution system by constructing a central warehouse and ten district warehouses and implementing an improved distribution system.

6. Teacher and Supervisory Staff Training

The Education Law raises minimum teacher qualification requirements for basic education teachers from two to four years post-secondary and for secondary school teachers and principals from four to five years post-secondary. To accommodate this increase, certification programs to upgrade academic qualifications of basic education teachers started in 1988 at the Higher College for Certification (HCC), branches of the HCC were started in Irbid and Karak, and certification programs were started at three universities during 1989-90. The current plan is to phase out community-college training programs for basic education teachers by 1993-94, and expand teacher training capacity at the Universities of Jordan, Yarmouk and Mutah by an additional 2,000 students per year. The academic and pedagogical capacity of principals and educational supervisors will be upgraded by requiring at least an MA, which can be earned through certification programs to be offered at the Universities.

In addition to the degree training, in-service training will be provided to introduce basic education teachers, principals, and educational supervisors to the reform objectives, new curricula, and textbooks, and to train them in the new pedagogical methods that will help them use the new inputs more effectively.

7. Educational Technology

Under the reform, new and some existing schools will receive laboratories, libraries, and workshops, intended to promote experimentation and practical skill development. Teachers' skills in preparing and using instructional aids will be developed and upgraded. Additionally, educational television programming will be developed to support both teacher training and some direct classroom instruction.

8. Educational Facilities Improvement

The MOE believes that the poor condition of many rented facilities impedes instructional quality and reduces educational efficiency. To reduce the number of students currently in rented facilities, the MOE plans to complete construction of 80 basic education and 10 secondary level schools by 1992 and to phase out rented school facilities. It is expected that the initial capital costs will be offset over time by the lower recurrent costs of owned schools.

In addition to the replacement of the rented schools, the MOE also will provide about 36,000 new student places to accommodate natural increases in enrollment by constructing new schools and expanding existing facilities. The MOE also will provide specialized facilities (laboratories, libraries, workshops) to 80 basic and 10 secondary schools by the end of 1992.

Goal 2: Institutionalizing the Capacity to Sustain Sectoral Reform

9. Strengthen Coordination, Monitoring, and Evaluation Capacity

This is being accomplished by creation of the National Center for Educational Research and Development (NCERD) charged with monitoring and evaluating progress on the Educational Reform.

10. Establish Capacity to Sustain Innovate Educational Practices

The NCERD has been charged with the conduct of large-scale sector-wide research, especially in the areas of applied educational research and policy analysis that will contribute to improving the efficiency of education. The Center is

responsible for interpreting and disseminating results of the research to relevant educational and political leadership.

11. Institutionalize the Process of On-Going Curricular Reform

This will be accomplished through staff development activities to be provided for staff in the Directorate of Curriculum.

12. Institutionalize Textbook Development and Distribution

The Textbook Publishing Unit was established in 1988. The experience it gains from publication and distribution of the new instructional materials over the next eight years is expected to provide the depth of experience necessary for these capacities to be institutionalized over the longer term.

Part 2: Purpose and Key Concepts in Evaluation

Purpose of Evaluation

Evaluation of the Reform will be undertaken by NCERD to provide information for educational planners and program managers which can be used to improve Reform activities and guide their continued implementation. The purpose is not to determine cause and effect relationships (the appropriate domain of research), but to identify points of needed intervention to ensure the success and long-term sustainability of efforts to improve educational quality and efficiency in Jordan. In some cases the impact of the Reform will be evidenced by disproportionate changes to historical patterns of student achievement, teachers' career satisfaction, facilities utilization, etc. For example, under the Reform, it is expected that student achievement will increase. In other cases, success of the Reform will be evidenced by key indicators remaining stable during a time of rapid change. For example, since participation rate is almost universal, it will not increase as a result of the reform, but neither should it decline.

The central evaluation questions to be addressed are:

- (1) Is the Reform being appropriately implemented?
- (2) Are the intended outcomes of the Educational Reform being achieved?
- (3) Are there unanticipated factors affecting progress toward goals of the Reform which need to be considered if continued implementation is to be successful?

A Model of the Educational Process

In identifying indicators of progress on the Educational Reform, it is useful to have a model of the educational process and a clear picture of what components of the educational process are to be affected by the Reform. The model can be used to help identify and organize indicators.

For purposes of this evaluation, the educational production process is understood to have four main parts: inputs, process, outputs, and outcomes. Inputs are the resources used in the educational activity and may be divided into the general categories of student characteristics, teacher characteristics, school characteristics, instructional and equipment characteristics, and facility characteristics. The process stage refers to the means by which educational inputs are transformed into educational outputs. For example, the teaching-learning process might involve classroom lectures, student discussions, use of textbooks, etc. Among the process factors to be considered in evaluating the Reform are the instructional procedures and technologies employed and the actual classroom use of skills provided by teacher training.

Outputs are the direct and immediate effects of the educational process. They include such things as students' cognitive achievement, attitude change, and behavioral change. Educational reforms also have teacher outputs. As reform policies and activities change the workplace demands on teachers, teachers' performance, attitudes, and morale may change. Outcomes refer to the long-term gains from the educational process and depend both on the effectiveness of the educational system and on a series of concomitant conditions (over which educators have little control) also occurring. For example, a frequently intended outcome of education is that graduates will find better employment. However, whether or not this occurs depends on economic conditions that go beyond the particular skill and competence of the graduates.

Important information can be gained by examining indicators at each point in the educational process. However, the most useful information comes by examining the relationship among indicators at different points of the process. For example, the interaction of inputs and process determine educational costs. The relationship of outputs to costs is a measure of internal efficiency. Both costs and internal efficiency are important indicators of progress on the Reform.

Effectiveness and efficiency have been identified as major goals of the Reform. Effectiveness refers to a level of output--the extent that the education system meets its desired goals. Efficiency represents a comparison of effectiveness to costs. Efficiency is the extent that effectiveness is maximized for a given level of inputs (cost) or when inputs

are maximized for given level outputs. Hence, efficiency subsumes the concept of program evaluation. A system that is not effective cannot be efficient.

The internal efficiency of an education system can be improved by lowering costs, by raising quality (effectiveness), or by doing both. It is important to recognize, however, that lower costs is not synonymous with improving efficiency. If modifying an educational activity in order to lower costs causes a disproportional drop in educational quality, efficiency will drop even though the activity costs less. Conversely, an activity is not necessarily less efficient if it costs more, as long as the extra expenditure leads to a disproportionate increase in output.

Described within this framework, The Jordanian Educational Reform seeks to change the outputs and outcomes of education by changing the inputs and processes of basic, secondary, vocational, and teacher education. The expectation is that the efficiency of the education system will be increased, not so much by improving student flow through the system or by reducing costs, but through increasing educational quality. Student flow statistics are already quite favorable--participation is almost universal and attrition and repetition rates are low. Likewise, due to MOE regulations, there is little teacher turnover. It is unlikely that the reform will improve these indicators. Similarly, costs of education may not decrease. Indeed, recurrent costs of education may increase (for example, as teachers are required to have more years of education, the salary budget will go up), but the expectation is that increased student learning will more than offset the increased cost. Efficiency of the education system will increase only as the quality of education increases. The most relevant indicators of progress, then, are those concerned with the extent that the Reform activities are actually implemented and those concerned with the quality of the education students receive.

Indicators of Progress on the Educational Reform

The input-process-output-outcome model described above can be used as a framework for organizing indicators of progress on the Reform. This section suggests how Educational Reform activities will be evidenced at each stage of the model. At each stage, these activities are described with respect to students, teachers, educational administrators, instructional materials, and facilities. While it is not possible (or desirable) to evaluate the Reform on all these indicators, the list offers a systematic way to examine the range of issues that confront those responsible for implementing the reform.

INPUTS Criteria: adequate and appropriate distribution of inputs

**Inputs with
respect to:**

Indicators

students students' demonstrate a motivation to learn and positive attitudes toward schooling

teachers teachers attend in-service training that introduces them to the goals and strategies of the Educational Reform

number of teachers upgrading their teaching credentials is consistent with projected demand for teachers at those credential levels

teachers understand the pedagogical techniques they are expected to use

teachers express commitment to trying the new pedagogical approach

schools are staffed by correct mix of teacher-by-subject area

**educational
administrators** number of principals and educational supervisors upgrading their education is consistent with projected demand for administrators at those levels

principals educational supervisors understand how to use new instructional materials

**instructional
materials**

textbooks are of appropriate reading
difficulty level for intended students

content coverage of textbooks is correctly
linked to material covered in previous and
subsequent grade levels

presentation of material emphasizes new
pedagogical emphasis: problem solving,
student engagement in learning tasks, etc.

an adequate supply of textbooks is published
on time

the correct number of textbooks are
distributed to schools on time

facilities

rented schools are replaced with owned
schools

new student places are built consistent with
the number projected under the Reform

new schools are constructed in geographical
areas of greatest need

existing schools receive libraries,
laboratories, and workshops consistent with
the number projected under the Reform

two new vocational schools are constructed
and equipped

PROCESS **Criteria:** Educators and students effectively use the new instructional materials and pedagogical strategy

**Processes with
respect to**

Indicators

students

students use the new curriculum and instructional materials

students actively participate in learning activities

students engage in problem solving activities that require critical and creative thinking

teachers

teachers correctly use new instructional materials

teachers correctly employ pedagogical techniques emphasized in the Reform. E.g., teachers emphasize active student participation in learning, student-teacher exchanges, and student-student discussion as part of the instructional process

teachers assess student performance and provide students with information about their progress

teachers watch in-service teacher training television programs that are available to them

	<p>teachers implement pedagogical practices presented in in-service teacher training television programs</p>
<p>educational administrators</p>	<p>principals and educational supervisors provide instructional supervision to teachers</p> <p>principals and educational supervisors are able to correctly answer teachers' questions regarding the appropriate use of new materials and pedagogy</p> <p>principals and educational supervisors evaluate teachers on criteria consistent with the teacher behaviors encouraged within the educational reform</p>
<p>instructional materials</p>	<p>students believe textbooks are clear, interesting and appropriately paced</p>
<p>facilities</p>	<p>construction of new schools is on schedule</p> <p>facilities are properly utilized (eg, students have regular access to library, teachers use laboratories, etc.)</p>
<p>OUTPUTS</p>	<p>Criteria: Student achievement will increase;</p> <p>teacher job satisfaction and quality of worklife will increase</p>

**Outputs with
respect to**

Indicators

students

student attainment

**skill proficiency of vocational school
graduates**

**improved problem solving and critical
thinking skills**

**secondary school graduates are able to pass
university entrance examination**

**students hold positive attitudes toward their
educational experience**

**student repetition and drop-out rates do not
increase over pre-Reform levels**

**students have received career advisement and
are aware of the range of employment
opportunities available to them**

students' sense of self-efficacy will improve

teachers

**number of teachers who have upgrading their
credentials is sufficient to meet projected
teacher demand**

**teachers understand goals and strategies of
the Educational Reform and how to use new
instructional materials**

those teachers upgrading their educational credentials demonstrate higher levels of content knowledge and pedagogical skills

teachers implement key ideas presented in in-service training.

job satisfaction and perceived quality of worklife increase

educational
administrators

administrators understand goals and strategies of the Educational Reform and how to use new instructional materials

job satisfaction and perceived quality of worklife increase

instructional
materials

student achievement increases

facilities

the shift of students from rented to owned school structures is related to increased levels of student achievement in those schools

the shift of students from rented to owned school structures results in lower recurrent costs

utilization of facilities (for their intended purpose) increases

OUTCOMES

**Criteria: School graduates are more competitive
for employment opportunities in the
Region**

**Outcomes with
respect to:**

Indicators

students

**increased competitiveness of school graduates
for employment opportunities in the Region**

**employers judge knowledge, skills, and
problem solving ability of school graduates
to have increased**

**parent and community interest in schooling
increases**

teachers

**job satisfaction and perceived quality
of worklife increase**

**teachers continue to emphasize the
pedagogical techniques introduced by
the Reform**

**educational
administrator**

**job satisfaction and perceived quality of
worklife increase**

**principals and educational supervisors
continue to emphasize the pedagogical
techniques introduced by the Reform when
supervising and evaluating teachers**

**teachers perceptions of administrators'
fairness and objectivity increases**

instructional materials	instructional materials continue to be updated on a regular basis, even after the end of the Reform period
facilities	construction of new schools keeps up with demand caused by increasing school age population without need to rent school space

Part Three: Extent to Which Indicators of Progress on the Educational Reform are Already Available in the Management Information System

The MOE and related agencies already collect a substantial amount of quantitative data about inputs, usually on an annually basis, as a means of describing the status of the education system. Comparable types of input data across several years (e.g., numbers of students, teachers, buildings, books, etc) can be used to identify trends and develop projections. Part Four discusses how these inputs data can be used to monitor progress of the Reform.

Little if any process data currently are collected. Output data are limited, consisting mostly of student attainment scores on the national examinations in the 9th and 12th grades. Outcome data are not explicitly collected by the MOE, though some types of data relevant to assessing outcomes are available from other ministries, such as economic indicators and employment statistics. Appendix B lists data by category and subcategory that are presently collected by the MOE. Progress is now being made to link these data into common data sets to allow for more complete analysis.

Overall, data in the present EMIS will be most helpful in planning for and monitoring implementation of the reform. For example, the combination of student enrollment, teacher supply, and enrollment in teacher training programs can be used to estimate whether teachers are being trained (or upgraded) at a rate greater than the increased aggregate demand for new teachers in the system. If the system is growing faster than teachers can be trained, progress on the Reform is threatened.

The usefulness of the existing data is increased dramatically by the capacity to disaggregate data by subcategories. Aggregate data often mask important variations across geographical areas and population subgroups. The success of the Reform depends not just on upgrading inputs to the education system, but on those improved inputs reaching

the classroom. Dissagregated data can be used to help ensure that the right mix of inputs is being received at the school level.

Part Four: An Agenda for Evaluating the Educational Reform

In early stages of implementation, careful attention to monitoring the distribution of inputs is more important than assessing outcomes. Without proper distribution of inputs, the Reform cannot be properly implemented and, without proper implementation, it is unlikely that the goals of the Reform will be achieved. If the Reform effort is to improve the quality and efficiency of education, educational resources (such as textbooks, teacher training, new schools) need to be distributed in an appropriate and timely manner. This can happen only as planners and program managers have and use the data needed to guide resource distribution. A series of specific monitoring studies that can help provide these data are suggested below.

At the same time, baseline information must be collected to allow for comparisons that will need to be made several years from now. In some cases, new data need to be collected. For example, information on the current pedagogical practices of teachers. In other cases, the necessary data are already collected and need to be properly archived. For example, preparations must be made now for appropriate computer files of student achievement data (and corresponding codebooks) from 1988 and 1989 to be easily available for comparison to 1995 data.

Monitoring Studies Needed

1. Describing Implementation

Success of the Reform depends heavily on the convergence of key inputs (trained teachers, textbooks, facilities) within the school. One monitoring study should chart progress of the Reform by matching actual inputs with intended inputs within each component of the Reform. All the needed data for this study are available from the EMIS.

For each phase of the Reform (Phase I: 1989-92; Phase II: 1993-95; Phase III: 1996-98), the actual numbers of teachers trained, schools built, textbooks distributed, etc., should be compared with the intended level of accomplishment. The chart provides a quick way for a reader to understand the components of the

Reform and visualize the magnitude of the changes taking place within the education sector.

More importantly, it provides a way to monitor whether needed inputs are converging in a manner likely to result in the educational process and outputs desired. Success of the Reform depends largely on multiple inputs converging within an intended pattern. Textbooks will not have the intended impact on student learning if the teacher training in how to use the materials has not yet occurred. Construction of new schools will not have the intended impact if textbooks have not yet been distributed. A proposed format for this monitoring is presented as Figure 1.

2. Monitoring Rate of Implementation Against Population Growth

An important policy study would be to monitor the growth of the education system relative to the increase in school age population. If school enrollments are growing faster than improved educational capacity is being provided, the overall quality of education in Jordan may not improve, regardless of the quality of the particular inputs. The education data for this study are available within the existing EMIS.

The first step in conducting this study is to develop projections of school enrollment (by grade and district) for the next five years. The number of students in each grade that are expected to go into the next grade can be computed by adjusting for grade repetition, attrition and transfer. The estimate for new Grade One enrollment can be based on either (a) national statistics on birth rate, which would indicate the number of school age children, or (b) the average annual increase in first grade enrollment for the last five years, which is can be computed from data already in the EMIS.

Based on these estimated enrollments, the needed number of trained teachers, textbooks, and student places can be projected (separately for each district) by using government policy about student:teacher ratio and number of textbooks per student, etc. These projections of need should then be compared to the estimated supply. Supply is determined by the number of trained teachers, textbooks, and student places that will actually be available (not necessarily the number called for under the Reform). Comparing estimated demand with projected supply will indicate if the Reform is being implemented fast enough and at a scale large enough to meet the growing need for basic and secondary education. The

Figure 2

Sample Schedule for Monitoring and Evaluating the Educational Reform

PROPOSED ACTIVITIES	TIME									
	Phase I			Phase II			Phase III			
	1990	1991	1992	1993	1994	1995	1996	1997	1998	
Monitoring Studies										
1. Describing Implementation		X	X	X	X	X	X	X	X	
2. Monitoring Rate of Implementation Relative to Growth			X		X		X		X	
3. Monitoring Distribution of Teachers-by-Subject	X	X	X	X		X	X	X	X	
Baseline Data Collection										
4. Classroom Observation Study	A			A			A			
5. Quality of Teacher Worklife	A			A			A			
6. Student Achievement in Rented and Owned Schools	X					X			X	
7. Teacher and Principals' Beliefs about Effective Teaching	A			A			A			
8. Cost Analysis		X				X			X	
Evaluation Studies Needed										
9. Evaluation of Textbooks		X	X	X	X					
10. Evaluation of Teacher Training		X	X		X		X		X	
11. Patterns of Change in Student Attainment	B				X		X		X	
12. Student Achievement	B				X		X		X	
Applied Research Studies										
13. Teacher and School Correlates of Student Achievement		X								
14. Analysis of Regional Disparities in Student Flow		C								

Notes:

- Data for the three studies marked "A" can all be collected within the same data collection activity.
- Studies marked "B" indicate need to collect and archive baseline data for use in subsequent studies.
- Studies marked "C" indicate research studies that can be conducted with data already collected in Studies 4, 5, 7, and 10.

Z/a

analysis will also indicate which districts are most seriously falling behind demand. This information can be used to target extra assistance to those districts.

3. Monitoring Appropriateness of Teacher-by-Subject Distribution Across Schools.

A prerequisite to success of the Reform is having a sufficient number of teachers available in each subject area in each school. Good facilities and better trained teachers are of little use if the teachers are not in the appropriate classrooms. Data to examine this issue are already available. An analysis of these data should be conducted as a baseline for evaluating subsequent success in implementing the Reform.

To conduct this study, student enrollment by school should be determined and used as the basis for calculating the number of teachers needed in each school. This should be compared with the actual number of teachers by subject area in each school. One way to summarize and report these results is to list (for each subject area and for all subject areas combined) the number of schools short one teacher, the number short two teacher, etc. The schools short a high percentage of teachers should be further analyzed to show the distribution of these schools by region. This analysis will indicate (a) which schools are most in need of additional teachers by subject and (b) whether some geographical areas of the country are having more difficulty than other in obtaining necessary educational inputs (e.g., teachers). These results can be used to guide further teacher assignment.

Baseline Studies Needed

Evaluation of the Reform will require good baseline data against which future educational activities can be compared. This section suggests four studies that should be conducted to provide baseline data for purposes of later comparison.

4. Classroom observation study of teachers' pedagogical behavior

Success of the Reform relies, in part, on teachers making appropriate use of the new textbooks and instructional materials and implementing the different pedagogical behaviors advocated under the reform (e.g., more active student involvement in the learning process, more attention to problem solving activities). It is proposed that a classroom observation study be conducted within selected grade levels and schools to provide a description of the pedagogical behaviors now

employed. These data are a baseline against which future data on pedagogical behavior can be compared.

This baseline data also can be used to evaluate teacher training. The pedagogical behaviors of teachers before and after they return to school to upgrade their teaching certification should be compared as a means of assessing the impact of the added training on actual classroom teaching. This issue is of particular importance, since the large scale upgrading of teachers credentials represents the major recurrent cost of the Reform.

5. Quality of teacher worklife

Teacher morale and job satisfaction are described as low. Moreover, many teachers may view the pedagogical demands placed upon them by the Reform as further increasing the complexity of their worklife which, in turn, may lower their job satisfaction even further. Over the long term, however, job satisfaction is expected to rise as teachers gain experience with the new materials and techniques. It is posited that job satisfaction will increase to the extent that teachers' perceive the new materials and training to have enhanced their teaching effectiveness and increased positive community regard for their work.

In order to assess the impact of the Reform on raising the quality of teachers' worklife, it is important to collect baseline data prior to full implementation of the Reform. A measure of job satisfaction and attitudes toward teaching should be administered to a representative sample of teachers early in the Reform. The data have two uses. A descriptive analysis of teachers' attitudes toward teaching can help inform the new teacher training. Secondly, the data serves as baseline information against which subsequent changes can be compared.

6. Differences in student achievement between rented and "owned" schools over the last five years.

One assumption of many Jordanian educators is that the quality of education that students receive in rented school facilities is inferior to that provided in schools owned by the government. Rented schools tend to be in poor physical condition and frequently are crowded. The schools built to replace the rented facilities are expected to provide better conditions for learning. To date, this assumption has not been empirically tested. While there may be many good reasons to replace rented schools with owned structures, the eventual evaluation of this policy in terms of increased student achievement only is reasonable if it can be shown that there is

presently an achievement discrepancy. A comparison of student achievement between these school types using data from the last five years will help indicate whether achievement is an appropriate indicator and will provide baseline evidence against which future data can be compared.

7. Teachers and Principals' Beliefs About Effective Teaching

Effective teaching requires three conditions be met: teachers must have the necessary content knowledge and pedagogical skills, they must believe those knowledges and skills are important, and they must perform those skills in the classroom. Even when teachers have the pedagogical skills, they may not use them in the classroom if they do not believe that these behaviors represent a good way to teach. Teachers' beliefs about teaching have to change along with their pedagogical skills if the Reform is to be successful.

To examine this output, baseline data on teacher and administrators' beliefs about teaching should be collected. In the short term, results of this analysis may suggest needed revisions in teacher training. In the long term, they provide baseline data for eventual claims about the impact of the Reform.

8. Cost Analysis

Increased efficiency of the Reform is expected to be achieved through increasing the quality of education rather than through lowering costs. Indeed, the recurrent costs of education may increase, particularly as teachers with more training qualify for higher salaries. It is important, however, to monitor the unit and cycle costs of education during the time of the Reform. This data will be needed in the consideration of efficiency (the relationship of effectiveness to costs) and in planning and budgeting.

Evaluation Studies Needed

9. Evaluation of New Textbooks

Textbooks define, organize, sequence, and pace the content to be covered. Research suggests textbooks often have the single greatest impact on student learning. It is essential, then, that the new textbooks developed under the Reform be carefully evaluated for curricular integration, appropriateness, and impact. It is proposed that a series of pilot studies of the new textbooks be conducted by

NCERD early in the Reform process so that findings can inform development the continuing materials development process.

10. Evaluation of Teacher Training

This evaluation should examine the consistency of the teachers' training (as it is actually delivered) with the content and pedagogical skills teachers are expected to use once they return to their schools. For example, is the training based on the actual material teachers will be expected to teach? Does the training "model" the behaviors teachers are being encouraged to employ in their own classrooms?

This evaluation also should examine the extent that teachers' content knowledge, pedagogical behaviors, and beliefs about teaching change as a result of the additional training. (This study can be conducted as an offshoot of Studies 4 and 5 above.) Changes should be examined to make sure they are in the intended directions. If little or no changes are observed, the efficiency of the Reform needs to be reexamined.

11. Patterns of Change in Student Attainment

The assumption of the Reform is that the convergence of better trained teachers, principals, new textbooks, and better facilities will result in higher levels of student learning. Consequently, a central element of the evaluation should involve an examination of student attainment before, during, and after implementation of the Reform. The MOE already collects a national measure of student attainment at the end of 9th and 12th grades which can be employed for this purpose. It is expected that the patterns of student attainment during and after the reform should be meaningfully greater than it was during the ten years prior to the reform.

Since, under the Reform, the 9th and 12th grade examinations have been dropped as a requirement for passing those grades, it may be necessary to administer these examinations on a special basis to a representative sample of students at the 9th and 12th grade levels at intervals during the Reform.

12. Patterns of change in student achievement

Attainment refers to students' performance at one point in time.

Achievement refers to students' knowledge gain and is measured as the change in performance between two points in time. One of the most direct ways to test the instructional effectiveness of the Reform is to compare student achievement between schools that have and have not received benefits of the Reform. Even a

small study, perhaps pre- and post-testing students in 50 schools that have been upgraded under the Reform with 50 that have not, could provide direct evidence of the effectiveness of the Reform interventions. While care would need to be taken in the sampling and testing procedures used, the results would allow direct claims about the effectiveness and (potentially) the efficiency of basic and secondary education as a result of the Reform.

Applied Research Studies Needed

In addition to evaluating progress in implementing the Reform, NCERD is charged with conducting applied research on issues of concern to Jordanian education. The following suggestion is offered as an example of one type of research that could be done.

13. Teacher and School Factors Related to Student Achievement.

What investments in education most contribute to student learning? Given limited funds for education, is it better to spend them on textbooks, teacher training, facilities construction, or something else? One way to examine these questions is to examine teacher and school factors related to student achievement, using multivariate statistical procedures. Results of such a study will not indicate whether the Reform is succeeding, but may suggest what elements of the Reform which should be emphasized during continued implementation.

14. Analysis of Regional Disparities in Student Flow

While the overall student progression rates in basic and secondary education are high, anecdotal data suggests there is wide variation

A Sample Schedule for Evaluating Progress of the Reform

Figure 2 offers a sample schedule for implementing the studies described previously. It is offered to illustrate two points:

- (1) Not all of the studies have to be done at the same time, they can be spread across the life of the Reform. A long-term schedule can help ensure that data are collected at the most appropriate times.
- (2) The data for several studies can be collected at the same time, often within the same data collection activity.

Figure 2

Sample Format for Describing Implementation

REFORM ACTIVITY	PHASE I 1989-1992		PHASE II 1993-1995		PHASE III 1996-1998		ALL PHASES COMBINED 1989-1998	
	<u>intended</u>	<u>actual</u>	<u>intended</u>	<u>actual</u>	<u>intended</u>	<u>actual</u>	<u>intended</u>	<u>actual</u>
Upgrade Teachers								
Upgrade academic qualifications of educators								
basic		4,000						
secondary		1,500						
Upgrade academic qualifications of administrators	360							
Provide in-service training to teachers	12,000							
principals	4,000							
supervisors	800							
other staff	750							
Expand capacity of education colleges		2000 per year						
Upgrade Curriculum/Textbooks								
Arabic								
textbooks		904,000						
teachers guides		19,550						
English								
textbooks		1,210,000						
teachers guides		51,050						
Islamic								
textbooks		811,000						
teachers guides		15,200						
Math								
textbooks		1,001,000						
teachers guides		18,550						
Science								
textbooks		843,000						
teachers guides		29,050						
Social Studies								
textbooks		342,000						
teachers guides		11,500						
TOTAL								

REFORM ACTIVITY	PHASE I 1989-1992		PHASE II 1993-1995		PHASE III 1996-1998		ALL PHASES COMBINED 1989-1998	
	<u>intended</u>	<u>actual</u>	<u>intended</u>	<u>actual</u>	<u>intended</u>	<u>actual</u>	<u>intended</u>	<u>actual</u>

Upgrade Facilities

Build new school places	80 basic		80 basic					
	10 secondary		10 secondary					
	(36,370 places)							
Replace rented schools with new construction	52,300 places							

Educational Technology

Science laboratories	295						745	
Audio-visual/storage facilities	34						560	
Libraries	246						820	
Learning resource centers			11				11	

Vocational/Technical Training

Expand and upgrade existing VTC centers			2					
Construct and equip new centers								to be specified by May, 1990

APPENDIX A

**Summary of Components of Educational Reform
from World Bank Appriaisal Report**

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or progress with respect to the introduction of new and revised policies, institutional changes and improvements covered under Phase 1 of the reform program, the Government and the Bank have agreed on following key actions, target dates/performance indicators. These would form the basis of semi-annual progress and would be reviewed jointly by the Government and the Bank during the annual and the mid-term reviews.

MEASURES	ACTIONS/TARGET DATES	QUANTITATIVE TARGETS/INDICATORS
1. ENHANCING STUDENT ACHIEVEMENT LEVELS		
POLICY MEASURES		
<p>STRUCTURE THE SCHOOL SYSTEM</p> <p>a) Extend basic (compulsory) education from nine to ten years and reduce secondary education from three to two years.</p>	<p>New Education Law was enacted in 1988. New structure to be introduced nationwide starting 1988/89 school year.</p>	
<p>b) Revise the "streaming" structure in the secondary cycle to (i) address diversified interests and abilities of individual students; (ii) promote specialization; (iii) use resources of the formal secondary education system more effectively by focusing on increasing the academic and technical quality of the flow into post-secondary education; and (iv) continue to transfer those vocational training programs that are geared to immediate labor market entry to the VTC.</p>	<p>Provide three major streams: science/math; arts/humanities; and technical/technology. Application of new structure to be finalized in 1989/90.</p>	<p>Content of technical/technology stream to be completed by February 1990; curricula for all streams approved by December 1990; and new textbooks introduced on a phased basis starting in September 1991.</p>
<p>c) Expand the intake capacity of vocational training centers under the VTC and broaden the specializations offered.</p>	<p>1. Broaden specializations in two existing centers and upgrade equipment.</p>	<p>To be completed by November 1990.</p>
	<p>2. Conduct a demand survey to serve as basis for the VTC vocational training capacity expansion.</p>	<p>The methodology of the demand survey to be agreed with the Bank by September 1989; findings & recommendations reviewed April 1990; mutually agreed action program to be implemented starting in July 1990. Subproject appraisal criteria and fund allocation guidelines to be mutually agreed upon by May 1990.</p>

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MEASURES	ACTIONS/TARGET DATES	QUANTITATIVE TARGETS/INDICATORS
<p>REVISE THE EXAMINATION SYSTEM TO ASSESS STUDENT ACHIEVEMENT LEVELS AGAINST LONGER-TERM PERFORMANCE AND AREAS OF SPECIALIZATION.</p>	<ol style="list-style-type: none"> 1. Replace the current basic education completion examination with a new system of promotion from the tenth grade to secondary education (11th grade) based on performance in the previous three grades. 2. Replace General Secondary School Completion Examination with a new system of specialized examinations in line with the streaming structure. 	<p>Development of the new system underway. Application of new system to start with students who will be in the eighth grade during the 1989/90 school year; system to be fully operational by the 1991/92 school year.</p> <p>To be implemented in June 1994.</p>
<p>USE SECTOR RESOURCES MORE EFFICIENTLY AND INCREASE COST RECOVERY LEVELS.</p>	<p>The study conducted under mutually acceptable terms of reference to be completed by the MOE by June 1989; reviewed jointly by the Bank and Government by December 1989; and implementation of the mutually agreed action program to start in March 1990.</p>	<p>Implementation progress to be provided in semi-annual progress reports and discussed at annual review meetings.</p>
<p>IMPROVE THE QUALITY OF TEACHING AND LEARNING</p> <p>CURRICULUM DEVELOPMENT Revise basic and secondary education curricula to help develop higher cognitive skills & abilities; reflect up-to-date pedagogy and contemporary issues; and address individual learning abilities and interests.</p>	<p>National Curriculum Committees have been established for each subject. All basic education curricula to be approved by the Board of Education and submitted for manuscript preparation by December 1989 (math curriculum has already been approved). New curricula for secondary schools to be introduced in Grades 11 and 12 in the 1992/93 school year.</p>	

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MEASURES	ACTIONS/TARGET DATES	QUANTITATIVE TARGETS/INDICATORS
<p>EXTBOOK DEVELOPMENT</p> <p>a) Provide textbooks and learning materials that are designed to support curricula objectives and are instructionally more effective.</p>	<p>1. Set up Textbook Publishing Unit at MOE (see under 11.4)</p> <p>2. (a) Publish and introduce new textbooks in math, science, English, social sciences, Islamic studies and Arabic in six of the ten basic education grades, for approximately 400,000 students.</p>	<p>1. Introduce:</p> <p>(a) new math & science textbooks for grades 1, 5, 9; and new English textbooks for grades 5 and 9 by September 1990;</p> <p>(b) new math & science textbooks for grades 2, 6, 10; and new English textbooks for grades 6 and 10 by September 1991;</p> <p>(c) new math & science textbooks for grades 3 and 7; and new English textbooks for grades 7 by September 1992;</p> <p>(d) new Arabic, social sciences, Islamic studies in grades 1, 5, 9 by September 1991; in grades 2, 6, 10 by September 1992.</p> <p>2. Complete 50% of the publishing process for new math & science textbooks for Grades 4 and 8, and new English textbooks for Grade 8 by December 1992.</p> <p>3. Complete the manuscript preparation process for new social studies, Arabic language and Islamic education textbooks for the basic cycle by January 1993.</p>

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MEASURES	ACTIONS/TARGET DATES	QUANTITATIVE TARGETS/INDICATORS
<p>BOOK DEVELOPMENT (cont.)</p> <p>(b) Improve textbook storage and distribution system.</p>	<p>(b) Test new textbooks for a full year and revise them in line with feedback from "users".</p> <p>Construct one central warehouse and ten district warehouses by the end of Phase I. Conduct a feasibility study, prior to proceeding with plans to design & cost the proposed distribution subproject by June 1990.</p>	<p>Complete user testing of:</p> <p>(a) math & science textbooks for Grades 1, 5, 9 & English textbooks for Grades 5 & 9 by July 1991; and</p> <p>(b) math & science textbooks for 2, 6, 10; English textbooks for Grades 6 & 10 by July 1992; and Arabic social sciences and Islamic studies for Grades 1, 5, 9 by July 1992.</p>
<p>TEACHER/SUPERVISORY STAFF TRAINING</p> <p>(a) Raise teacher qualification requirements: for basic education teachers from two to four years post-secondary; for secondary school teachers and principals from four to five years post-secondary.</p>	<p>1. Legislated by the 1988 New Education Law:</p> <p>2. (a) Certification program to upgrade academic qualifications of basic education teachers started October 1988 at the Higher College for Certification (HCC).</p> <p>(b) Branch of HCC started in Irbid in February 1989. branch in Karak scheduled for September 1989.</p> <p>(c) Certification program at three universities to start in academic year 1989/90.</p>	<p>Annual intake of 300 in 1988 completed. Annual intakes during the 1989/90 - 1992/93 period will be about 375.</p> <p>Annual intake of about 375 at each campus during Phase I.</p> <p>Annual intake of 500 by the University of Jordan; 300 by the University of Yarmouk; and 200 by the University of Mutah.</p>

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MEASURES	ACTIONS/TARGET DATES	QUANTITATIVE TARGETS/INDICATORS
/SUPERVISORY STAFF TRAINING (cont.)	(d) Certification programs to be evaluated.	HCC program being evaluated. Results to be available February 1989; appropriate modifications to be incorporated into the program; annual evaluations to be conducted throughout Phase I and results made available for program modifications for the next year's intake.
	3. To phase out community-college training programs for basic education teachers tentatively by 1993/94 academic year and expand teacher training capacity of the Universities of Jordan, Yarmouk & Mutah by an additional 2,000 students p.a. during Phase II.	University programs to be evaluated annually; results to be available by end of academic year and revisions to be incorporated in the following year's program. Expanded capacity to be in place for additional intake of 2,000 teacher candidates as of academic year 1992/93. Visiting faculty and overseas fellowship training programs to start as of academic year 1989/90. Construction to start October 1990.
b) Improve the academic and pedagogical leadership capacity of principals and supervisors.	Upgrade academic qualifications of principals to a BA + pedagogical diploma equivalency and of education supervisors to an MA through certification training at universities.	Annual intake of 60 for each group starting in the 1989/90 academic year.
c) Introduce basic education teachers and other staff to the reform objectives, new curricula, textbooks; and train them in new pedagogical methods to use the new inputs more effectively.	1. Strengthen the content and delivery mechanisms of the current in-service training program; provide the equivalent of 60 hours of training locally.	1. Launch "train-the-trainer" program in October 1989. 2. Train about 12,000 basic education teachers; 120 lab assistants and 640 librarians, a/v technicians by September 1992.

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MEASURES	ACTIONS/TARGET DATES	QUANTITATIVE TARGETS/INDICATORS
TEACHER/SUPERVISORY STAFF TRAINING (cont.)	2. Introduce principals and supervisors to the reform objectives, new curricula, textbooks, new pedagogical methods and prepare them for their new academic leadership role.	Provide in-service training to about 4,000 principals and to 800 education supervisors by September 1992.
<p>EDUCATIONAL TECHNOLOGY</p> <p>(a) Promote experimentation, practical skills development and self-learning by the provision of specialized facilities (labs, libraries, workshops) in new and some existing schools.</p> <p>(b) Develop, upgrade teachers' skills in preparing instructional aids and using them effectively.</p> <p>(c) Supplement curricula and classroom instruction by educational TV broadcasts and audio/video cassettes.</p>	<p>Construction and equipping covered under "educational facility improvement" below. Training of specialized facility staff covered under "in-service teacher training".</p> <p>Develop "software" programs primarily for in-service teacher training programs and for a selected number of grades on a pilot basis.</p>	<p>Review jointly the MOE study and agree on the plan of action to maximize effectiveness by January 1990.</p>
<p>EDUCATIONAL FACILITY IMPROVEMENT</p> <p>Improve the quality of classrooms and introduce of specialized facilities.</p>	1. Replace rented facilities with purpose-built schools.	During Phase I, start construction of about 45 schools annually; by December 1992, complete construction of 60 basic education and 10 secondary level schools. These schools to accommodate 52,300 students currently in rented facilities.

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MEASURES	ACTIONS/TARGET DATES	QUANTITATIVE TARGETS/INDICATORS
EDUCATIONAL FACILITY IMPROVEMENT (cont.)	2. Accommodate natural increases in enrollments.	These facilities to accommodate about 25% of the natural enrollment increase by creating about 36,000 new student places by December 1992.
	3. Provide specialized facilities (labs, libraries, workshops) in new and some existing new schools.	Provide specialized facilities to 80 basic education and 10 secondary schools by December 1992.

II. INSTITUTIONALIZING THE CAPACITY TO SUSTAIN SECTORAL REFORM

Strengthen the Technical Unit established within the Higher Council for Science and Technology to monitor, coordinate and appraise projects and to coordinate and monitor their implementation.	The Intermediary was established in March 1988 by Prime Ministerial Decree.	The Intermediary's capacity to be assessed on an ongoing basis during Bank supervision missions as well as mid-term and annual reviews.
Establish institutional capacity for innovation in education over the long term.	Establish a National Center for Education Research and Development with responsibility to conduct policy-based and other large-scale sectoral research; disseminate state-of-the-art knowledge through seminars and visits by leading educators; and conduct longitudinal assessment of the reform.	Center to be established by December 1989. Recruit core staff by March 1990. During each annual review of progress, Bank and Borrower would review Center's research output and outcomes during the preceding year, discuss Center's work program for the following year, and propose areas of study for inclusion in the program.
Institutionalize the process of on-going curriculum reform.	Strengthen the capacity of MOE's Directorate of Curriculum to manage curricula preparation and the revision process.	Progress in implementation of the mutually agreed staff development program and work program of the Directorate to be assessed during mid-term and annual reviews.

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MEASURES	ACTIONS/TARGET DATES	QUANTITATIVE TARGETS/INDICATORS
) Institutionalize textbook development and distribution.	A Textbook Publishing Unit was established in the GDCET and fully staffed in November 1988 to handle all aspects of textbook publishing, contracting, production supervision, and for the management of textbook distribution.	Progress in implementation of the mutually agreed staff development program and work program of the Unit to be assessed during mid-term and annual reviews.

APPENDIX B

Indicators Currently Available in the Education Management Information System

The following list indicates data that are regularly collected and maintained by the Ministry of Education or a related agency. While not all data elements are contained in the same data sets, efforts are now underway to develop an integrated data base which will allow the merging of data elements into a common data set (at least on an as-needed basis).

INDICATORS

Administrative Structure

- number of employees by
 - cycle (primary, preparatory, secondary)
 - district
 - MOE office
 - type of work
 - administrative unit in the MOE
 - length of service

Schools

- number of schools by
 - cycle (primary, preparatory, secondary)
 - district
 - shift
 - urban/rural
 - ownership
 - gender
 - controlling authority

Classes

- number of class units by

cycle
 shift (1st/2nd)
 rural/urban
 controlling authority
 ownership
 gender
 number of general education classes
 number of multi-class rooms in
 MOE schools
 number of rooms (other than
 classrooms)
 usage

Students

number of students by:

cycle (primary, preparatory, secondary)
 district
 urban/rural
 ownership of school
 gender (male/female)
 controlling authority
 shift (1st or 2nd)
 enrollment status
 religion
 age
 promotion
 repetition
 drop-out
 attainment

9th grade examination
 12th grade examination

by subject
 by district
 by school

2/9

Teachers

number of teachers by:

cycle (primary, preparatory, secondary)

district

level of training

urban/rural

ownership of school

gender (male/female)

controlling authority

shift (1st or 2nd)

enrollment status

religion

age

turnover

secondment

resignations

retirement

deaths

salary level

Expenditure Data

Overall expenditures

recurrent expenditures

personnel

others

transportation

rentals

utilities

other services

supplies

furniture

equipment

overall

transfer expenditures by

grants

contributions

scholarships
capital expenditures
equipment
buildings and structures
others
studies and research
work and construction
overall

Annex A

Indicators of Progress in the Jordanian Educational Reform A discussion paper

by

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Ms. Amal El-Kharouf
Dr. David Chapman

May, 1990

A Proposal for Evaluating TEACHER TRAINING

Improved efficiency of education in Jordan will only come through improving the quality of instruction at the classroom level. This will occur only as teachers' content knowledge and pedagogical skills are improved. Teachers determine the instructional events in the classroom, deliver instruction, mediate students' encounter with instructional materials, and do much to shape students attitudes and values about learning. Improved classroom instruction is central to the success of the Educational Reform. Consequently, evaluating the success of the teacher training should be a priority activity.

A second reason to undertake evaluate the training is the substantial financial implications of posed by this activity. Within the Educational Reform, the single greatest impact on the national recurrent education budget is posed by the plan to expand teacher training and require substantial upgrading of teachers' educational credentials. Costs are experienced directly, as the Universities increase their annual teacher training effort, and indirectly, as teachers at higher levels of certification qualify for higher salaries.

Indicators of success in teacher training can be formulated with the model of inputs, process, outputs, and outcomes suggested in the Indicators paper. Five general criteria should be considered in designing the evaluation:

INPUTS

1. Fidelity of Pedagogical Strategy

The Educational Reform is expected to improve student achievement by shifting the emphasis of instruction to greater student participation and engagement in their learning, more emphasis on problem solving activities, and less teacher centered instruction.

However, it was left to the teacher training and textbook writing teams to operationalize these goals in ways that reached the classroom. Specific criteria for evaluating the fidelity of pedagogical strategy are suggested below.

- (a) the clarity with which the new pedagogical behaviors are defined within the training;

This issue can be addressed through a content analysis of the instructional materials employed within the teacher training and an observation study of the training itself. It is important that this study be conducted by evaluators who have a strong grounding in the research literature on effective instructional practices.

- (b) the clarity with which the new pedagogical behaviors are presented within the training;

This should be conducted through actual observation of training and by a structured interview with trainees. It will be important that the intended pedagogical strategies be clearly defined prior to designing the observation and interview protocols.

- (c) the extent that trainees are given the opportunity to practice the target behaviors within their training;

This can be determined by observing the teacher training and may be collected within the same data collection activity described above (1.b).

- (d) the clarity with which the new pedagogical behaviors are monitored within the training;

Not only do trainees need to have the opportunity to practice the intended pedagogical behaviors within the training setting, they need to receive clear feedback on their performance and specific suggestions for how they might improve. The extent this happens should be examined within an observation and study of the training and further considered in an interview study of trainees.

PROCESS

2. Extent Training is Focused on the Material Teachers are Expected to Teach

The training should teach participants to understand and use the materials they will have available to them once they are in their classrooms. This is especially important during the Reform, since teachers will be working with new textbooks. One

criteria of the evaluation, then, should be the extent that the content presented in teacher training is consistent with the content presented in the textbooks. This can be assessed through observation of actual instruction within the teacher training program by observers familiar with the new curriculum and textbooks.

3. Instructor Modeling of Intended Pedagogical Behaviors

Effective teacher training requires that instructors in the program model the behaviors they advocate that teachers use in their own classrooms. For example, if teachers are asked to encourage more active student participation in their classrooms, University instructors should be employing those same techniques within the teacher training. This "modeling" helps trainees clarify their understanding of how to implement the intended teaching methods. The extent that this happens can be determined through observation of the teacher training.

Outputs

4. Teachers' Mastery of Content

Teachers must demonstrate both knowledge and understanding of the content they are expected to teach. These should be examined through a pre and post-test of trainee knowledge and understanding of the material taught.

5. Changes in Teacher Attitudes and Beliefs About Teaching

Overall implementation of the Reform will require a shift in teacher attitudes and beliefs about teaching, particularly with respect to how teachers view the teaching-learning process. Only as beliefs and attitudes change are teachers likely to implement the learning methods advocated within the Reform. At the same time, intended long-term outcomes of the Reform include improved job satisfaction and perceived quality of worklife. Changes in teachers' attitudes and beliefs about teaching during the time they are in training should be assessed. Several instruments are available which address these issues and have been used in other countries. Their relevance and appropriateness to the present evaluation should be examined.

GUTCOMES

6. Teachers' Ability to Implement the New Approaches Upon Returning to their Classroom

One of the most direct criteria of whether training is effective is whether teachers implement improved instructional methods in their classroom. This can be examined through a classroom observation study of trainees after they return to their classrooms. Observers should follow a structured observation protocol that focused on teachers' use of instructional strategy emphasized within the Reform, for example, active student participation, opportunity for students to practice their new learning, use of problem solving approaches within instruction, effective use of the textbooks and other instructional material available in the classroom, etc.

7. Improved Student Achievement

The goal of teacher training is to improve instruction as a means of improving student learning. While factors other than instruction influence student achievement, some gain in student performance is expected as a result of teacher training. This can be assessed by comparing student performance before and after their teachers have received training or by comparing student performance between classes taught by teachers with different levels of training. Both of these studies present serious methodological problems, but also address one of the most direct criteria of progress of the Reform.

Annex B

**Indicators of Progress in the Jordanian Educational Reform
A discussion paper**

by

**Dr. Kapur Ahlawat
Ms. Amal El-Kharouf
Dr. David Chapman**

May, 1990

**Outline for a Proposed
TEXTBOOK EVALUATION**

Research suggests that textbooks often have the single greatest impact on student learning. Textbooks define, organize, sequence, and pace the content to be covered. Within the Jordanian Educational Reform, they represent a primary mechanism by which new content and improved learning strategy are conveyed to the classroom level. Because of the centrality of textbooks in determining the quality of classroom instruction, it is important that they be carefully evaluated early in the Reform process and any problems detected be corrected immediately. Six areas that should be considered in a materials evaluation are described below.

1. Appropriateness of curricular integration.

Content coverage of textbooks at each grade level should be appropriately linked to the content students covered the previous year and that which they will cover in the next year. While the Curriculum Writing Teams have worked to address this issue, it is still an appropriate and necessary consideration for the evaluation. Such a study is most easily conducted using expert review. An independent, outside team should review the curriculum and textbooks across grade levels with the particular purpose of examining curricular integration.

This panel of experts should also be asked to evaluate the books across an addition set of criteria concerned with pacing of the material, clear expression of ideas, use of clear examples, adequate range of examples to illustrate ideas, etc.

2. Fidelity of Pedagogical Strategy

The Educational Reform is expected to improve student achievement by shifting the emphasis of instruction to greater student participation and engagement in their learning, more emphasis on problem solving activities, and less teacher centered instruction. However, it was left to the teacher training and textbook writing teams to operationalize these goals in ways that reached the classroom. An important criteria for evaluating textbooks, then, is the extent and clarity with which they convey the new pedagogical approach. This evaluation might be conducted through expert review of the textbooks, perhaps combining it with the review of curricular integration discussed above.

3. Reading difficulty.

A frequent problem in textbook preparation is that the materials are written at too high a level of reading difficulty relative to the intended users. Several reading difficulty formulas are available, but the basic concept is to define reading difficulty in terms of word length, sentence length, paragraph length, and complexity of punctuation. The more complicated the sentence structure, the more difficult the text is to read and understand. The reading difficulty of any given passage is compared to the reading difficulty level that previous research has found to be appropriate at each grade level. Reading difficulty indexes have been developed for many languages and efforts are underway to see if such a formula is available for Arabic.

4. Ease of teacher use.

Within the classroom, teachers ultimately determine how textbooks will be used. For textbooks to have the intended impacts on student learning, it is important that teachers understand how to use them and regard them as easy to use. For example, many teachers appreciate textbooks that suggest the length of reading assignments, pose review questions, and suggest supplemental student activities. One way to determine ease of teacher use is the use of a "focus group" methodology. Groups of 5-10 teachers who have used the textbook are invited to discuss their experience using the book and to suggest specific ideas for revising it. The leader of the focus group guides the discussion with a series of prompts that direct participants' attention to key issues (e.g., length, clarity, pacing, review questions, etc.), and encourages teachers' to express their ideas. It is important that the focus group not be used as an opportunity to explain or defend the

textbook, but as an opportunity to elicit the reactions and suggestions of the teachers on how it could be improved. A second way is to ask a sample of teachers who have used the book to complete a written survey in which they identify specific strengths and weaknesses of the text and suggest ways it might be improved. Early in the textbook development and implementation process, it is recommended that the focus group procedure be used.

5. Student reactions to the textbook

Additional information about ease of use can be gained by conducting focus group discussions with students who have used the materials. They should be asked to identify portions of the text that were unclear, words or ideas that needed to be explained, and places in which the pacing of content was too fast or too slow.

6. Distribution of Textbooks Across Schools

Even the best textbooks will have no impact on student achievement if they are not in the hands of the students. In addition to evaluating the quality and usability of the textbooks, the study should examine the adequacy of their distribution to the schools. This is particularly appropriate, since improving the textbook distribution system is an important part of the Educational Reform. This evaluation should begin with a random check of the textbooks available in the schools that should have received them. This will determine if the books are being received at their intended destination.

Sometimes the problems in textbook distribution are widely known to the individuals most directly involved in their distribution but not fully understood by people at higher levels of the organization who are in a position to make the changes necessary to improve the system. One role of evaluation is to systematically collect and present such information to people in positions to solve the problems being encountered. A second part of the study, then, should involve systematic interviews with key persons in the distribution sequence to identify the primary problems being encountered in getting the textbooks published and into the correct schools on time.

Annex C

Indicators of Progress in the Jordanian Educational Reform A discussion paper

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May, 1990

Outline for a Proposed Classroom Observation Study

Improved quality of instruction and enhanced student performance are major goals of the Educational Reform. However, they will be achieved only as improved pedagogical practices are implemented at the classroom level. Direct classroom observations of teachers can provide important data on the extent that these changes are occurring. While observation studies generally are expensive and labor-intensive, the importance of the information gained often warrants the effort.

Within the model proposed in the Indicators paper, classroom observations yield process data. These process data can be used in the evaluation of specific inputs that were intended to alter process, such as teacher training and textbooks. Process data also can be used to monitor overall progress of the Reform, separate from any particular input, for example, changing patterns in classroom instructional practices. It also provides an important data base for policy research on the factors related to teacher

Collecting valid and reliable classroom observation data requires that :

- the behaviors to be observed be carefully and clearly specified,
- the observer use a well defined protocol for recording observations,
- observers have professional training in education and preferably experience as teachers
- observers be well trained in the use of the observation protocol,
- each teacher be observed several times, preferably by different raters,

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- interrater reliabilities across observers be computed and data collected by individual with particularly low agreement be dropped from the study, and
- the manner which the data will be analyzed and reported be clearly worked out in advance of data collection.

To keep the observation study cost effective, it is important that observation time be spent collecting only data that have clear implications for practice. This requires careful planning and a full understanding of how various possible outcomes of the study might shape subsequent teacher training, instructional supervision, textbook preparation, etc. Costs can be minimized further by having observers also collect data needed in other aspects of the evaluation. For example, the observations teams might administer a questionnaire on the quality of teacher worklife or teacher job satisfaction while they are in the schools.

The following categories of observation are examples of the types of data that can be collected through a classroom observation study.

availability of instructional materials within the classroom

frequency of teacher's use of instructional materials (teachers' guides, textbooks) and teaching aids (e.g., chalkboard, posters, etc.)

frequency of student's use of instructional materials (textbooks) and teaching aids (e.g., chalkboard, notebooks, etc.)

type and frequency of active students' participation

type and frequency of teacher-student verbal exchanges

type and frequency of student-student verbal exchanges

teacher's use of instructional time

frequency of specific instructional strategies (e.g., clear objectives, teacher's use of feedback, class organization, use of informal assessment, logical presentation, etc.

observers' rating of classroom affect

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