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THE IMPACT OF THE THIRD IDA EDUCATION LOAN PROJECT

by

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CHAPTER I

INTRODUCTION

A. Project Background

Among developing countries, the Philippines has one of the most highly developed educational system. Enrolment ratios are high at all levels: almost 100% in the elementary level, 46% at the secondary level, and 21% at the tertiary level. The teaching force is comparatively well-trained. 95% of elementary school teachers are certified, and three quarters of the latter have university degrees. Physical facilities are generally adequate.

Despite the above, the Philippine Educational System is beset by some large weaknesses. Among these are:

1. ineffective management due to an uncoordinated bureaucracy, inadequate planning, and a lack of statistics to guide decision-making;
2. outdated curricula which do not reflect scientific, economic, or political developments of the past decade; and
3. a serious lack of textbooks and other teaching aids (on the average, there is one book for every ten pupils)".

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Because of these weaknesses "the well-qualified teaching staff is handicapped in its work. Reliance must be placed on learning by rote to an undesirable extent. The result is low quality which is manifested in poor examination performance, and a high dropout and repeater rates at the upper stages of each cycle."[1]

A major attempt to remedy this problem is the subject of this study. The 3rd IDA Education Loan is a project of the Educational Development Projects Implementing Task Force (EDPITAF) as part of the program of reforms in basic education of the Ministry of Education and Culture. Implemented thru the Textbook Board Secretariat (TBS), the project aims to strengthen textbook development, publishing, and utilization. Specifically, the project identified three major targets:

1. The development of 100 book titles covering the areas of Science, Mathematics, Social Studies, and Communication Arts from Grade One to Fourth Year.

2. The printing of 60 million textbooks for distribution to 11 million public school children to achieve a ratio of one set of textbooks for every 2 students.

3. The training of approximately 250,000 public school teachers at the primary and secondary level on the use of the textbooks.

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[1] Lecture delivered by Director P.N. Aprieto, Textbook Project, EDPITAF, at the Communication Foundation for Asia Seminar and Textbook Writing. Nov. 4, 1978.

The implementation of the project started in school year 1976 - 1977 with the organization of the Textbook Board Secretariat (TBS) in July 1976. In schoolyear 1977 - 1978, 10 million books were released consisting of 14 titles. Every year after that, the expected production is 15 million books. The project is expected to terminate by the schoolyear 1980 - 1981. Meanwhile, provisions are made to make the project self-sufficient for continuity without the help of external funds.

B. National Level Activities

1. Textbook Development

With the 3rd IDA Education Loan, the Textbook Board was abolished and replaced by the Textbook Board Secretariat (TBS). The 7 divisions of the divisions of the TBS not only monitor but assist in strengthening textbook development. Instead of the process previou adopted by the old Textbook Board, the TBS sees to it that a textbook undergoes the textbook development cycle. A textbook with the accompanying teacher's manual takes at least 3 years to develop: the activities involved are planning, writing, testing, revision, and editing. The book is printed and distributed on the 4th year.

Instead of publishing houses proposing the titles of books to be published, the project has designated 3 curriculum development centers for the writing and testing of textbooks. Thus, the textbooks

are sure to be authored and written by Filipinos. This applies to 109 basic textbooks for the public schools from Grade one to Fourth year high school in science, math, social studies, Pilipino and English. These centers are UP Science Education Center, PNC Language Study Center and MEC Social Studies Center. Two other schools are producing teaching guides - Philippine College of Arts and Trade and Central Luzon State University.

The textbooks are then tested for one school year in at least 40 representative schools. This tryout ensures that it is usable and acceptable nationwide. Feedback on the quality and content of textbooks are elicited during the try out stage which serves as an important source for revision/the revision and editing is then done by the curriculum development centers with assistance from the editorial division of the TBS. The production division of the TBS then prepares the manuscript for printing.

The process of subjecting manuscript to the review of independent editors preserves the high quality of textbooks approved by the TBS. This is done through coordination with curriculum writers along these aspects:

1. preparation of scope and sequence charts which are based on conceptual schemes

2. lateral linkages among subject areas and integration of concepts from different program thrusts and imperatives such as environmental education, health and nutrition, etc.

3. vocabulary control for certain grade levels

4. amount of material (text matter, photographs, number of pages, size of type print)

5. schedule of completion.

2. Textbook Printing

The printing of the textbooks is done by the private sector. The printer is selected through international competitive bidding in accordance with World Bank requirements. Director Aprieto of the TBS reports that of the 30 textbooks awarded for printing involving 20 million copies have been won by foreign printers. This shows the capability of the printing industry to respond to the needs of the project. There are presently 64 pre-qualified local printers on the basis of their plant capacity. Orders for textbooks range from 180,000 copies for 4th year high school to 1.3 million for grade one.

Paper mills were also pre-qualified to supply specified paper for the project. Due to the stringent requirements set by TBS (the paper must last from 3 to 6 years and the brightness sufficient to make the prints readable in unlighted rural classrooms) the quality of

local paper products had to be improved. In addition to paper mills, the graphic arts industry also benefited from the project. Typesetting demands caused the expansion of facilities in typesetting companies. Art and design studies, ink manufacturers, and other related sectors increased productivity and quality standards.

The work of the textbook industry does not end with the project. At this stage, the approved textbooks are already manufactured commercially for the use of private schools. The commercial publication of EDPITAF textbooks is also done by competitive bidding. There are presently 20 publishing companies who are pre-qualified to bid. The books are then sold at commercial bookstores at prices set by the TBS.

3. Textbook Distribution

The project textbooks are distributed through a network of 107 regional and divisional warehouses in the 13 MEC regions. The project constructed 54 of those warehouses at a cost of more than ₱5 million. The books are picked up by commercial forwarders at the TBS warehouse and delivered to the regional warehouses. The delivery contracts are awarded by public bidding. From the regional warehouse, the local MEC structure takes over responsibility for the textbooks.

A mass training of teachers in every level is provided for in the project. This training enables the teacher to use the new textbooks effectively, through appropriate teaching strategies, instructional resources, and evaluation instruments. The target number is 250,000

teachers which is roughly 80% of the teaching force. This target has been reached as of this date.

Finally, continuing evaluation is conducted by the TBS to determine the effectiveness of the textbooks.

C. Local Level Activities

A portion of the project's activities took place in the local level. To obtain data on Implementation of the Textbook Project, Cotabato City division was taken as an example to document the following activities:

Summer Institutes conducted by the RSDCs
Use of trial texts by the participants of the Institutes for a period of one year
Feedback to Curriculum Development Centers for finalization of the texts
Distribution of the final edition to the teachers.

1. Teacher-Training

The textbook project was started in Region XII with the opening of the RSDC (Regional Staff Development Center) at Notre Dame University. NDU was designated as the RSDC for Communication Arts and Social Studies while Notre Dame of Marbel College was designated as RSDC for Mathematics and Science. These two institutions are sub-centers of the Notre Dame

Educational Association which is the official RSDC for Region XII.

As stated previously, the process of institutionalizing the use of the textbooks included the establishment of 14 RSDCs all over the country to train teachers in the use of the textbooks and the other materials produced under the project. The RSDCs were supposed to be assisted by Development High Schools (DHS) and Decentralized Regional Centers (DRC).

In the summer of 1976, NDU started the first summer institute for Communication Arts. It had 26 participants coming from different schools in the region. The schools represented were 15 try-out schools, DHS and DRC. The city division was represented by teachers from both public and private schools. Three other institutes were conducted one each during the summers of 1977, 1978 and 1979.

The summer institutes had a dual purpose - the training of teachers for the use of try-out texts sent by the Curriculum Development Centers and the training of staff for echo seminars on the use of textbooks and of the supplementary teaching materials.

According to the scheme, such echo seminars were to be held at both division and district levels so that ultimately the training inputs would reach down to the classroom teachers who would be using the project textbooks. In addition to these, the TBS conducted mass training of teachers at different levels in the use of textbooks.

2. Textbook Distribution

The scheme for textbook distribution is an extension of the national structure. The books are sent by air freight thru designated cargo companies addressed to the supply officer of the regional warehouse. These are then forwarded to the division supply officer concerned. Although the local MEC takes over the function, funding for distribution at this level still comes from the TBS.

To date, the city division has received book titles. The textbooks supplied under each title includes the teacher's copy and the pupil's copy. In cases where there is an oversupply of copies, this is indicated in the title ledger held by the supply officer and the number of unused copies are kept in reserve at the division warehouse.

The allocation for each school is based on the reported enrolment during school year 1976-77. Due to the unstable conditions in the Cotabato City area, there were significant fluctuations in the enrolment during the succeeding years. This situation has led to various problems relating to the objective of achieving the desired student-textbook ratio of 2:1.

Unlike the regional warehouse which was constructed with TBS funds, the division warehouse was the existing division property office. Its location a few meters away from the port would have made it a convenient storage area. Ironically, the books are sent by air freight rather than sea transport. Also situated adjacent to the city division office and its warehouse. The regional warehouse is situated within the compound of

the City Central School and was built at a cost of ₱144,000.00.

3. Textbook Use

Due to the limitation of funds, only public schools all over the country are provided with textbooks under the project. These are provided free to students at a ratio of 2 students to 1 textbook. When books are forwarded to teachers by the supply officer, the responsibility for their upkeeping is transferred to the teachers.

The division supervisors monitor the progress of both teachers and pupils in the process of using the textbooks. In the city division, one of the supervisors is placed directly in charge of the project. She coordinates with the Textbook Board Secretariat together with the supply officer of the city division.

D. The Monitoring and Evaluation System

The Monitoring and Evaluation scheme covers a) the distribution of the textbooks, b) the utilization of the textbooks, and (c) the implementation of the teacher-training component of the project.

1. Textbook Distribution

The goal of the monitoring and evaluation scheme as far as textbook distribution is concerned is to ensure that the target of "1 book per 2 pupils" is achieved. This component of the project has already been integrated to the structure of the Ministry of Education and Culture. For this purpose, a nation-wide system of textbook warehouses has been cons-

tructed using project funds. This system provides for one warehouse for each school division throughout the country.

The initial data input for the distribution system was the 1976 enrolment reported by the schools to the Textbook Board Secretariat. This data was used to compute an annual projection of enrolment for the years within the project period for each participating school. This projected enrolment is the basis for the number of copies allocated and eventually distributed to the school, allowing for additional copies estimated at the division level which becomes part of the division reserve.

Distribution is under the control and responsibility of the MEC supply officers at different organizational levels. From the central national warehouse, the books are sent to the regional warehouse then to division warehouse where they are finally picked up by the school principal. At each stage of the distribution flow, the number of textbooks are monitored in order to ensure that the copies actually distributed match the allocated number.

At the division level, the supply officer makes use of the division reserve (see above) to correct discrepancies between the allocation and the actual reported enrolment of the schools. At the school level, a thorough physical examination is made of the copies in order to spot defects in production. The number of copies found physically defective are reported to the division supply officer who, in turn, passes the information up to the central supply officer/warehouse. When possible, the division supply officer makes use of the division reserve to make up for

the defective copies. The central warehouse in turn replenish the division warehouse to make up for the total copies in the division found defective.

The books are then turned over to the classroom teacher who becomes responsible for their security and up keep. At the end of the year, a report is made by the teacher on number of books lost or rendered unusable. (Pupils are supposed to pay for books lost or damaged by them. However, if they are unable to do so, teachers are made to pay thru salary deductions.) A school report is prepared and submitted to the division office. A division report is then prepared and submitted to the central office.

2. Textbook Utilization

Unlike the scheme for textbook distribution no formal monitoring and evaluation scheme for textbook utilization exist except at the national level. An elaborate monitoring and evaluation scheme has been developed and is being implemented by the Research and Evaluation Division of the Textbook Board Secretariat.

The goal of this nationwide monitoring and evaluation scheme is 1) to assess the change in pupil achievement level, if any, resulting from classroom utilization of the textbook, and 2) to determine what impact other factors, interacting with the textbook, may have on pupils' achievement.

For this purpose a research scheme was designed which made use of three groups of pupils -- a control group, an experimental group and an

adjunct group. Achievement tests in three subject areas 'Sciences, Mathematics, and Pilipino) were constructed. A nationwide sample was drawn for each of the three groups. Various contributory variables and their corresponding indicators were identified, defined, and incorporated into a questionnaire which was administered in conjection with the achievement test. The information gathered thru the achievement tests and the questionnaires were then analyzed. All of the above were done at a national level by the Evaluation Division of the Textbook Secretariat with minimal participation at the lower level of the MEC structure.

Theoretically, monitoring and evaluation of textbook utilization is supposed to have been incorporated in the regular evaluation and supervisory program of the lower levels of the Ministry's organizational structure. Perhaps, a case can be made that this is in fact being done. However, no formal scheme exists and project-specific data are not gathered.

3. Teacher Training

The teacher-training component of the project was designed at the national level by the TBS staff in cooperation with the CDCs (Curriculum Development Centers) staff. There were two levels of implementation: the Trainors (including try-out teachers) level and the mass level.

Training at the trainors level was implemented at and by the RSDCs (Regional Staff Development Centers). These are institutions of higher learning both public and private previously identified by the TBS staff as having capabilities to perform this service for the region. Training

at the mass level was done through the regular division and district organization.

For the trainors level, there exist a formal monitoring and evaluation scheme. Pre-training workshops and conferences were conducted by the TBS staff with the RSDC staff to discuss the training scheme and to submit their detailed training scheme. Monitoring visits were conducted during the course of training. Post-training conferences were held to evaluate the implementation of the program.

Detailed records of the participants' progress were kept by the RSDC staff. In certain cases, some kind of achievement tests were administered to the participants at the end of the training. In 1980, trainors-training was transfered to the DLRCs (Decentralized Learning Resource Centers). It is not known whether the same kind of participants monitoring and evaluation scheme was implemented.

As stated above, mass level trainings were conducted at and by the division and district levels. The monitoring and evaluation of these training sessions were done by the division and district staff. No evaluation of the achievement of the individual participants was conducted. However, there were detailed discussions of potential and actual problems related to the training program.

4. Student Academic Achievement

One of the immediate effects expected from the textbook project is the increase in the academic achievement level of pupils Corollary to this is the increased time given to teachers for the preparation of supplementary teaching materials. This will contribute to the pupil's exposure to a wider scope of learning.

To measure the above-mentioned immediate effects the TBS Training and Evaluation Section conducts a pre-test and a post-test for every book title in some 400 selected schools throughout the nation. Only two schools in the division are included in this sample.

The city division has also its own achievement testing program. Unfortunately, this testing program does not specifically focus on the project textbooks.

The evaluation division of the TBS, called the Program Evaluation Section (PES) functions mainly to determine project effectively in improving the education of Filipino pupils and students. In the past 5 years (1976-81) it has undertaken the following studies

1. Annual evaluative studies of MEC-TBS textbooks:

   These are studies on the impact of the textbooks on the academic achievement of pupils. The research design used was mainly quasi-experimental. There were 21 achievement tests developed in evaluating 16 textbook titles. Findings in some of the data already analyzed showed a

positive effect on academic achievement. The effect, however, is very small. The results of studies for Grade I and II are shown on the following tables.

2. Other related studies: Studies not in direct relation to its summative evaluation function were undertaken such as:

   a) Evaluation of the one year textbook tryout
   b) Teacher training evaluation
   c) A study of the character traits embedded on MEC-TBS textbooks
   d) A survey of textbook damages and losses
   e) Content analysis of front page newspapers

This then is the subject of the present study. The objective of the study is to assess the impact of the textbook project on the ESIA/WID areas of concern: income and income growth, income distribution, production and productivity, employment, population and fertility, environment, energy, participation, health and nutrition, education and literacy. The area most directly affected by the project is education and literacy. To some extent, production and productivity together with income growth and distribution would be affected by the massive inputs of capital and the consequent development of textbook development production and development skills. Effects on the other areas will be mediated through education and literacy.

CHAPTER II

THE ANALYTICAL FRAMEWORK

A. Review of Related Literature

Education is perhaps one of the most researched fields. However, the review of related literature conducted by the investigators reveal a paucity of literature that bears directly on the research thrust of the ESIA/WID Project, i.e., a study of the impact of an educational development project on the specified areas of concern.

The literature which relates directly to the ESIA/WID research thrusts may be divided into two categories: 1) macro-economic studies that focus on the contribution of education and the educational sector to national economic growth or development usually expressed in terms of per capita GNP or income growth; and 2) educational function studies that focus on the relationship of educational outcomes, usually expressed in terms of academic achievement, and relevant educational inputs.

Macro-Economic Studies

W.G. Bowen (1963) made a comprehensive appraisal of many of the macro-economic studies concentrating on the major approaches. Bowen categorizes these macro studies into four major approaches:

1. the simple correlation approach which seeks to compare an over-all index of education activity to an index of economic activity;

2. the residual approach where the residual in the rate of increase of GNP not due to the rate of increases in measurable inputs (capital and labor) is attributed to other inputs specifically advances in technology and education;

3. the direct returns to education approach which seeks to compare net income gain of the individual or the nation to the costs or expenditures in education;

4. the forecasting manpower needs approach which assumes that a certain level and rate of growth or manpower is needed to attain a certain specified level and rate of growth of GNP or national income.

Simple Correlation Approach

An important study using the correlation approach is the work of F.H. Harbison and C.A. Myers (1964). Harbison and Myers constructed a composite index of human resource development using as indicators weighted values of enrolment rates at the secondary and tertiary levels. This index was then correlated with indicators of economic development - GNP per capita and the proportion of agricultural workers to the total labor force. They found a very high positive correlation between the

composite index of human resource development and GNP per capita (0.888); and high negative correlation in relation to proportion of agricultural workers (0.814). Bowen in discussing this simple correlation approach points out that begs the question of the cause- and effect relationship of education and GNP.

Residual Approach

Kendrick (1961) constructed a combined input index of capital and labor inputs using as weights their shares to total GNP and comparing the growth of this index to the index of the total output or GNP. He finds that for the U.S. economy between the period 1889 and 1957, 40% of the increase in output can be attributed to the residual. However, Kendrick does not indicate how much is due to educational inputs. Edwards F. Denison (1962) is more specific in his assessment of the residual effect. He estimates that 23% of the growth in total national income and 42% of the growth in per capita income in the U.S. can be assigned to the educational inputs over the period 1929-57.

Bowen observes two main flaws in the residual approach: first, capital inputs indices fail to reflect quality improvements embodied in these inputs; and second, the residual can embody so many factors that some people call it the measure of our ignorance.

Direct Returns to Education Approach

B.A. Weisbrod (1962) using mainly the previous work of T.W. Schultz (1960) estimates the rates of return of education to the

individual in the U.S. as 35-54% for an elementary or grade school education and 14-17% for a high school education, with the higher value attained if the option value of education is taken into consideration. Weisbrod in his computations assumes a 9% rate of return for college education, the rate obtained by G.S. Becker (1960).

An ILO study (1974) on the economic contribution of Philippine education shows that the social rate of return ranges from 4-7.5% and the private rate of return ranges from 4-9%. The breakdown by educational level is presented in the table below:

Table 1

Rate of Return to Different Levels of Schooling, 1971
(Percentages)

Years of schooling completed	Social rate	Private rate
Primary (1-4 years)	5.0	9.0
Primary (5-6 years)	6.5	8.0
High School (1-3 years)	4.0	4.0
College (1-3 years)	5.0	5.5
College (4 years)	7.5	9.0
College (5 or more years)	7.0	8.0

The above rates are obtained on the assumption that 65% of the earning differentials or income is accounted by the differences in educational level attained.

The forecasting manpower needs approach related literature shall not be discussed here since this assumes a-priori that education contributes to or causes economic growth on the basis of the findings of the simple correlational analysis of education and economic development which have been unable to resolve the cause-and-effect relationship of the two variables.

Education Production Function Studies

Foreign Studies. The development effect of education has long been subject of concern among economists, sociologists, and psychologists alike. Although educationalists would stop at student achievement as a measurable output in the educational process, attempts have beem made to go farther in measuring educational impact. Most of the studies previously made on the educational process made use of the production function as the main analytical tool. Leigh Alexander and John Simmons (1975) gave the formula:

$$A_{it} = g(F_{i(t)}, S_{i(t)}, U)$$

as the most commonly used form of the Educational Production Function.

The formula gives the relationship between A (outcomes for the student i at a certain time t) and the various inputs such as family background, relevant school inputs, peer or fellow student characteristics, external influences such as community and the innate endowments of the students. All the inputs are limited to the student i and cumulative to

time t. U is the error term included in the model. The combination of these inputs will result to output or product A. The authors caution however that interaction between behavioral change and all the other factors can be captured by the Educational Production Function only if the educational outcomes can be simultaneously determined. They also caution that the model is subject to simultaneous equation bias; -- e.g., improvements in academic achievement will improve the self confidence of the student, thus creating at once a change in one of the inputs that contributed to the resulting output. To avoid these biases that tend to disrupt the model, requirements were set for estimation such as the use of multi-regression techniques, choice of the right input coefficient, selection of the input variables.

Another weakness of the model is the variation on the inefficiencies among schools. This tends to give an average production function which is not helpful in allocative policy decisions. Even with multi-stage regression techniques, the more efficient schools cannot be distinguished from the less efficient schools in providing allocations in the educational sector. However, this defect can be remedied by recursive, causal path analysis.

The same study classifies the consequences of the learning process into cognitive and non-cognitive outcomes. These factors influence behavioral change which in turn creates an impact on specific areas of concerns. This cognitive and non-cognitive classification was also adopted by Lawrence J. Lau (1978) in his treatment of education

outputs. Lau definition of cognitive outputs include:

> "subject-specific as well as general improvements in abilities and/or knowledge and are typically measured by achievement test scores or grades. Non-cognitive outputs include changes in attitudes, interests, preferences, and values, degree of socialization, and other similar affective outputs."

The inputs are broadly classified by Lau into five categories: Home resources, School resources, Community characteristics, Student resources, and Peer Group characteristics.

In both studies of the Educational Production Functions the objective was to establish a relationship between the inputs in the schooling or learning process and the outputs in terms of cognitive and affective outcomes. Alexander and Simmons tried to identify these inputs which might be recommended to policy-makers as:

> "having a significant impact on schooling outcomes, specifically cognitive achievement of students in developing countries."

On the other hand, Lau's concern is to find out how the educational outputs can be achieved through the educational production process. The evaluative objective is therefore missing in both studies. However, there is no question as to the importance of the educational production function as an analytical tool for purposes of formulating measures in evaluating the usefulness or effectivity of certain educational inputs.

Philippine Studies. A nationwide project on Philippine Education adopting to some degree the model of Alexander and Simmons is the SOUTELE Project of the Ministry of Education and Culture. SOUTELE (Survey of Outcomes of Elementary Education) had as one of its main objectives, to identify factors in the learning environment which serve to explain variations in scholastic achievement for various categories of individuals. A nationwide survey was conducted using sets of research instruments consisting of:

a. battery of achievement tests designed to measure outcome of elementary education in terms of major curriculum areas;

b. student attitude inventory to measure levels and type of effective learning;

c. socio-economic questionnaires to gather data on pupils, teachers, school heads and school facilities.

Test results for the first set show that elementary graduates can answer only 50% of the test items correctly, implying that at a passing grade of 75% they have learned on the average only 2/3 of what they are supposed to learn; that the areas where learning performance is lowest is in the field of reading, mathematics, and language; and that there is no significant difference between the achievement level of the elementary school graduates and the 5th graders. The second set shows that the pupils possess positive

attitudes towards their teachers and school life while the third set shows that pupils with low socio-economic background have lower achievement level compared to the rest. Although teachers and school-heads are well qualified to handle their positions, school facilities and materials are inadequate and contributed largely to the slow development of the learning process.

The two studies on Philippine Education mentioned above (ILO and SOUTELE) are just two examples of a number of studies dealing with the identification of factors influencing the level of scholastic achievement. In using the Educational Production Function as the analytical tool, previous studies focused on the impact of various inputs on the desired educational outcome - usually the achievement level. There is a dearth of studies on the impact of educational outcomes on intervening variables and specific areas of concern.

One of the studies available that touches this field is the evaluation studies of Project IMPACT of INNOTECH, Ministry of Education and Culture. Project IMPACT (Instructional Management by Parents, Community and Teachers) is a new system of delivering elementary education, using the parents, community and teachers as the managers of the learning process. A recently concluded 5 year experimental project in nine areas in the Philippines, Project IMPACT was studied extensively from various points of view. Main points of analysis were the impact of educational innovations such as learning modules, community learning centers, and the use of teachers as learning supervisors in lieu of their traditional role. J.C. McMaster did a

Cost-Effectiveness analysis of Project IMPACT (1978). He reported that on the basis of SOUTELE tests' results, students at IMPACT schools have achieved a higher level of educational attainment compared with students from traditional schools. His findings showed that:

> "the application of IMPACT technology on a wider scale will reduce the need to train as many new teachers. This could lead to significant cost savings to the economy ..... The low current salaries of teachers compared with people of equivalent education is an indication that the educational sector has been over supplied with skilled manpower. A reallocation of human resources from the educational sector could lead to an increase in economic growth and real income per head."

Findings such as the above give the relationship of the inputs to outputs in education, and the impact is measured as far as the macro areas of concern. In this project, the learning module (input) results in less time involvement of teachers (output or later factor) which in turn results in the reallocation of human resources in the educational sector; which will finally result not only in cost saving for the economy but additional manpower available to other sectors.

Impact of Textbooks Studies

Jose R. Arong (1978) made a study of the nationwide assessments of the performance of the educational system conducted in the seventies by four ASEAN nations: Indonesia, Malaysia, Philippines, and Thailand. Among the assessments' results he reported are:

1. in the Thailand national assessment, it was found out that the variables that relate to achievement but account for small portion of scholastic achievement variations are pupil-teacher ratio, space per pupil, teacher qualification, and textbooks availability;

2. in the Indonesia national assessment, it was found out that at the time of the survey, children who were using the new prescribed textbooks were not achieving the curricular objectives as well as those using other textbooks.

A more relevant study that touches on the effect of textbooks on academic performance is the paper presented by Ernest Schiefelbein and Joseph Farrel (1977) at the Conference on Social Science Research and Educational Effectiveness held at Bellagio, Italy. Entitled "Factors Associated with Educational Achievement in Chile", the study was designed to determine the relative effect on student performance on a national achievement test of a number of variables representing characteristics of the student himself, his classmates, his teachers, school, family, and community.

Among the variables used, textbook availability came out as the single variable most strongly associated with academic performance. The table below shows the correlation between test scores and significant input variables.

Table 2

Correlations Among Four Measures of Family Social Class Level and Four Selected In-school Variables with Total and Part Scores in the Chile National Grade 9 Test, 1970

Variable	Total Score	Math Score	Verbal Score
A. Social Class Variables			
Consumption scale	.31	.25	.29
Father's education	.29	.24	.27
Mother's education	.31	.27	.28
Father's occupational prestige	.21	.21	.16
B. In-school Variables			
Availability of professional specialist	.16	.08	.19
Availability of Textbooks	.36	.25	.38
Number of classrooms	.16	.11	.16
Total school enrolment	.19	.19	.14

The study also specified the effect of textbooks availability in terms of three variables -- social class of student, type of school, and sex of student. The results showed that:

1. Among boys, the greatest textbook effect is found among lower-class students in private schools while the effect among higher-class boys is much smaller and identical in public and private schools;
2. Among girls, the textbook effect is greater for higher class students in both public and private schools.

It was therefore the conclusion of the authors that textbook availability has a positive relationship to academic performance. Its greatest effect could be discerned among children in the lower social classes who would most likely be in need of educational assistance.

The available literature, therefore, are of two kinds: a) those that analyze the impact of education upon national development, both on the macro-country-wide level and b) those that study the impact of the components of the educational process upon learning, both cognitive and affective. The impact of textbooks is not a main concern in practically all of the studies. Where it is alluded to, the conclusions vary quite sharply.

The ESIA/WID concerns are more specific. It identifies a set of social and economic variables as criterion for national development. It also focuses on textbooks as a specific input into the educational process not only as a learning tool but also in its aspects of production, distribution and utilization. Hence the need for a wider and more comprehensive framework for analysis.

B. The General Analytical Model

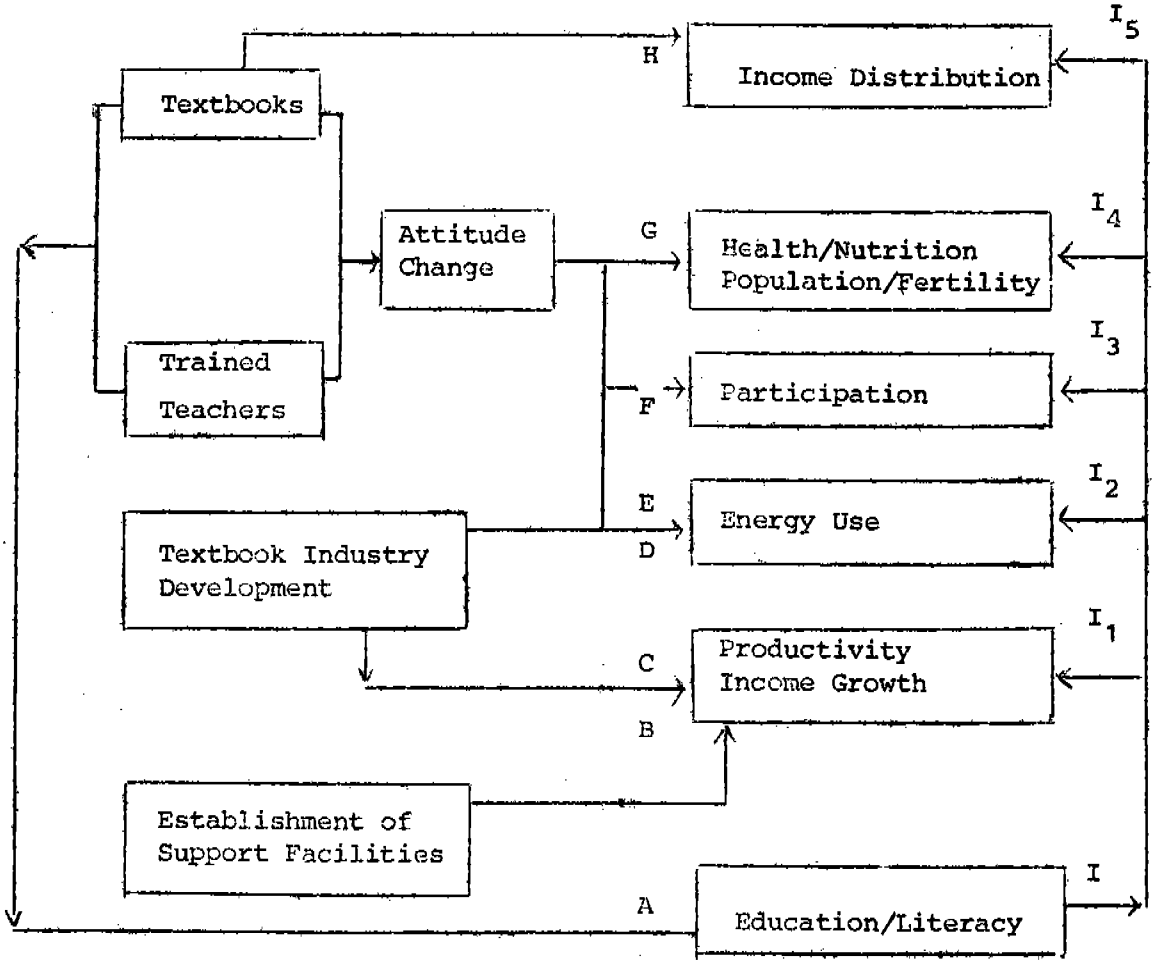
For the purpose of the study, four distinct project outputs have been identified: textbooks, trained teachers, development of the textbook industry, and establishment of support facilities. Textbooks are the volumes actually developed, printed, and distributed under this project to the public elementary and high school pupils/students. Trained

teachers are those elementary and high school teachers who have undergone the various training programs in the use of the new textbooks conducted by and/or under the sponsorship of the EDPITAF Textbook Project staff. Development of the textbook industry refers to the various improvements in the national textbook industry that can be directly attributed to the project. The textbook industry is conceived here to be principally the textbook publishing industry itself, i.e. improvements in related industries such as paper manufacturing are seen as project impact. Establishment of support facilities refer to the warehousing and distribution facilities/network established in connection with the project.

As an initial step in the evaluation of the project, primary linkage paths of the aforementioned project outputs with the ESIA/WID impact areas of concern were conceptualized. These are presented in the following illustration:

Figure 1

PROJECT AREAS OF CONCERN



Linkage path A indicates that two project outputs -- project specific teacher-training and project textbook outputs -- have direct and observable short-term impact on one area of concern, i.e. education and literacy. Linkage paths A-I_s indicate that the same project outputs have only an indirect impact (mediated by their impact on education/literacy) observable only in the long-term on the other areas of concern. The examination of linkage paths I_s is the usual concern of the macro-economic type of studies.

Linkage paths, E,F, and G point to the indirect impact (mediated attitudinal change) of project specific teacher-training and project textbook outputs on the following ESIA/WID areas of concern: health/nutrition, population/fertility, participation, and energy use. It may be argued that the two project outputs will have indirect impact on all the areas of concern; however, it is doubtful whether this will be large enough as to be observable.

It is also indicated in the schema thru linkage path H that the project textbook output will have a direct impact on income distribution, i.e. to the extent that these textbooks are made available for free to pupils educational sector only, then this represents in effect a subsidy to the families concerned and a subsidy withheld to the families with pupils in the private sector.

Linkage paths B, C, and D indicate that the two other project outputs -- textbook industry development and establishment of support facilities -- related directly to the following ESIA/WID areas of concern: energy use, productivity, income growth, and employment.

C. Limitations on the Analytical Model

The above consideration suggests that in order to properly assess the impact of the 3rd IDA Loan project, four distinct assessment models should be developed, i.e. a distinct assessment model for each of the four groups of linkage paths identified above:

1. linkage path A,
2. linkage paths E, F and G
3. linkage path H, and
4. linkage paths B, C, and D.

However, in order to properly assess linkage paths E, F, and G a study must be made on the translation of attitudinal changes into behavioral changes. Even under the most ideal conditions, such study is fraught with difficulties. Thus for the purpose of the project the impact on the relevant areas of concern will be taken to mean impact on attitudes towards the said areas of concern. This translates the assessment into that of the assessment of affective educational outcomes.

Since the 3rd IDA Loan Project is an education project, assessing the project impact on income distribution as such would result in an incomplete picture. To complete the picture, it is necessary to determine the extent to which this income redistribution impact has corresponding educational outcomes (both intellectual and affective). This suggests that linkage path H should be examined in relation to linkage path groups #1 and #2.

Thus for all practical purposes, only two distinct assessment models are needed: one on the impact area of education (linkage paths A; E, F, and G; H) and another for the remaining areas of concern. This also, in effect, means distinct models for the project outputs: 1) textbook and teacher training, and 2) textbook industry development and support facilities construction. But because the principal aim

of the 3rd IDA Loan is to effect improvement in the education sector, the main thrust of the assessment will be along the lines suggested by the "impact on education" model.

For the purpose of the evaluation, the MEC-EDPITAF Decentralized Educational Development Planning (DEDP) goals were used as operational definitions of "impact on education." These are:

1. improved learning level of graduates,
2. reduction of disparity of achievement level,
3. reduction of disabling effect of deprived environment,
4. participation rates,
5. survival rates, and
6. institutional development.

Institutional development can be assumed since to the extent that teachers are given additional training and pupils provided textbook, institutional development occurs. Participation and survival rates are subject to the influence of stronger factors such as health conditions, geographical and climatic conditions, peace and order, etc. Hence assessment of the project outputs along these lines would be difficult and the results will be of doubtful significance. Numbers 1, 2, and 3 above speak of improvement in learning either directly or indirectly. Thus the principal focus of assessment will be on the impact of project outputs on pupil's learning.

D. Impact on Development Concerns Other Than Education and Literacy

In evaluating the impact of the textbook project on development concerns other than education and literacy, analysis will be limited to the project's effect on the textbook industry and its consequent impact on income distribution, employment, productivity, and income. Textbook industry is defined here to include textbook writing, printing and publishing, and distribution. The project also has long-term impact on the above-mentioned development concerns via its impact on education and literacy; but such impact will not be considered here since it is already a well studied aspect. (Cf. literature on macro-economic studies of education and literacy.)

Basic Assumptions. The analysis of the project impact on non-educational concerns hinges on the assumption that the project progress is in accordance with the timetable and operational plan. It is supposed to have produced half of its quota of textbooks; otherwise, the expected project outputs would not have been realized and its impact hardly felt in any of the concerns.

Another assumption is the validity of previous findings that there is a need to develop the textbook industry in the Philippines. This implies that there is an existing base to work on and the textbook project serves to create the stimulus that would make the wheels roll faster.

Project outputs. The relevant project outputs that will be considered here include the following:

1. Development of Filipino authors/writers of textbooks;
2. Development of public school textbooks with Philippine orientation;
3. Development of a network for testing textbooks;
4. Construction of warehouses (for storage) and other support facilities;
5. Development of a market for textbooks.

These outputs are secondary in nature since they are only incidental to the decision to produce textbooks for the country's elementary and secondary public schools. Nevertheless, they need to be given some consideration.

Relationship of Project Outputs to Development Concerns. As previously mentioned, the impact of the project to income distribution, employment, productivity, and income can be traced mainly through the project outputs immediate effect on the development of the textbook industry. Textbook industry development consists of the following components:

1. Filipinization of textbook writing;
2. Institutionalization of textbook writing and adoption process;

3. Integration of the Textbook Industry; and

4. Improvement of the profitability of the textbook industry.

The impact of the project on income distribution is effected through the Filipinization of textbook writing and to a certain extent by the improvement of the profitability of the industry considering the fact that the majority of workers in the industry belongs to the lower scale of income earners. Hence, an improvement of its profitability may mean higher earnings for this type of workers.

The impact of the project on employment can also be traced via the first and fourth components and the integration of the textbook industry. The relationships of these variables with employment are quite straight-forward and do not need further elaboration.

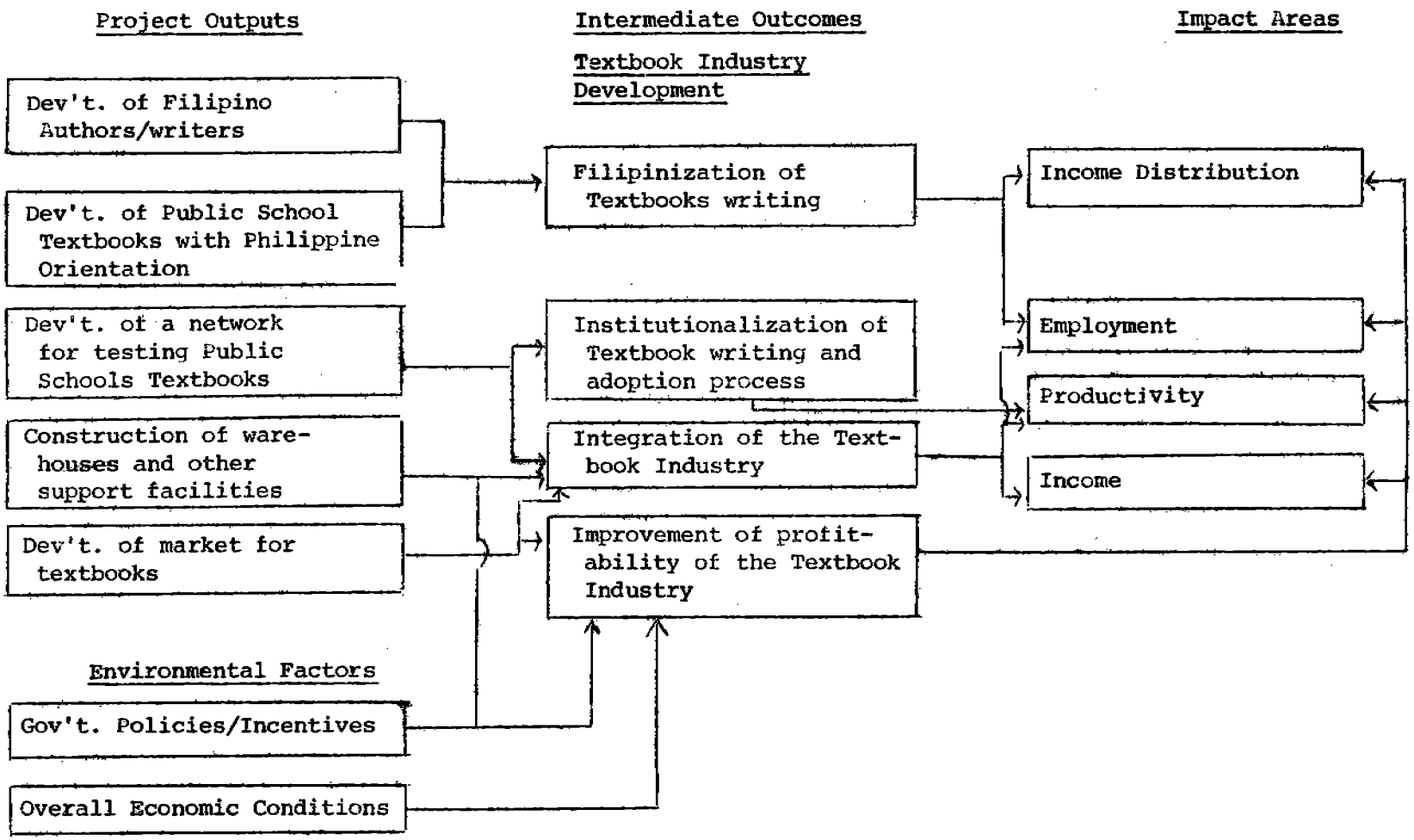
The horizontal integration of the textbook industry can also lead to increases in productivity and income through a higher multiplier effect as a result of greater forward and backward linkages. For example, the improvement of the textbook industry may stimulate the growth of paper and paper products industry and other related industries.

The institutionalization of textbook writing and adoption process can result to a reduction of time spent in the writing and review process and consequently to an increase in productivity of the industry.

Environmental Factors. Some environmental factors may have a significant influence on the intermediate outcomes of the project. Government policies/incentives such as tax exemptions or tariff protection for imported textbooks for instance may have a positive effect on the profitability and integration of the textbook industry. Since the textbook industry forms only a small part of the economy, its activities will also be largely determined by the overall economic health or conditions. The influence of the economic health variable particularly on the industry's profitability, however, may be captured by a proper choice of indicators, so there may be no need to include it as a separate determining variable.

Figure 2 (p.39) shows the schematic diagram of the relationship involved among the variables.

Figure 2. Analytical Framework of Textbook Project Impact on Development Concerns Other Than Education and Literacy



E. The Statistical Model

The main focus of this study, therefore, will be the impact of the textbook project upon student learning. Given the nature of the available data and the basic objective of estimating the unique contribution of textbooks to the explanation of variability in learning, a production function statistical method is most appropriate. Many attempts have been made to develop production function models for the education system. Educational researchers themselves are the most brutal in criticizing the use of educational production functions.

One of the reasons for this is, aside from many statistical restrictions, that the educational system is highly inefficient. Most statistical models explain little of the overall variance. This is due mainly to the fact that large proportions of the variance in academic and affective outcomes are explained by factors outside of the educational system, e.g. socio-economic background. Secondely, the most important factors which determine academic achievements are characteristics with which students enter the schooling system. Finally, the impact of education upon society at-large is felt only after long periods of time.

In trying to analyze the impact of textbooks on learning, it must be understood first of all that a textbook is only a tool for learning. (Cf. Deighton) It is one among many components of learning environment which contribute to pupil's learning. Among the more significant other components are pupil's background characteristics, school facilities, teachers' background characteristics, peer group, etc.

These components of the learning environment interact among themselves to bring about pupils' learning or better to help the pupils to learn. Aside from their impact as parts of an environment however, these factors have their own direct effect upon the learning of the child.

A second assumption that has to be made is that the most important variable which explains variations in learning is a set of variables called the pupils' background or antecedent characteristics. These include their socio-economic status, their I.Q., and their academic achievement levels. Several studies have shown that these antecedent variables taken together explain practically all of the variations in learning as measured by standard tests.

The above assumptions suggest that the assessment of textbook impact should be posed operationally not in terms of isolating or separating the specific contribution of textbooks to learning but in terms of estimating the contribution of textbooks to learning in relation to the other constituents of the learning environment.

The principal components of the educational process most relevant to the present study and for which data are available are as follows:

Y_1 = Scores in standardized achievement tests in three subject areas: Social Studies, Pilipino, Mathematics. This is the criterion or dependent variable #1.

X_1 = Measures of Textbook Utilization.

X_2 = Measures of Teacher-Training specific to the Utilization of project textbooks.

X_3 = Measures of Teacher Quality.

X_4 = Measures of School Characteristics.

X_5 = Measures of Socio-Economic Status of project beneficiaries.

The statistical analysis will be in two stages. The first stage will be an attempt to reduce the mass of available data into a set of composite scales or indices. The second stage will utilize these composite measures in a series of hierarchical stepwise regressions aimed at estimating the unique contributions of each of these indices.

Stage 1: Index Construction

Reducing the number of variables in a data set into manageable subsets appeals to the scientific principle of parsimony. The most direct way of accomplishing this is to simply analyze the obvious face value of the various measures and combine them into subgroups of conceptually coherent composite indices. A more sophisticated and statistically justified method is to estimate the degree of coherence and the relative weights of each of these measures. Thus the resulting composite scale or index will capture the proportionate contributions of each of the measures that compose the scales.

Several techniques are available. This study will make use of the common factor analysis method. From the array of variables several factors will be extracted and appropriate labels will be given them. The factor loadings will be used as weights in the computation of the overall score on the composite measure of each individual respondent.

Stage 2: Regression Analysis

After the composite indices have been constructed, a series of hierarchical stepwise regressions will be computed on the various test score. The advantage of this analytical model is that once the order of the variables have been specified, a unique partitioning of the total dependent variable's variance accounted for by the K variables ($R^2_{y.123....k}$) may be made. This model is also appropriate in cases of correlated independent variables, which is assumed to be the situation in this study.

Since in this study, there are three dependent variables and five independent variables, fifteen equations will be formed (five for each dependent variable).

Equation #1: Textbook Utilization (x_1) will be the only predictor. Since this is the variable of interest in this study and in the project itself, this variable is entered first in the regression analysis.

$Y = A + B_1X_1$

where B_1 = regression coefficient

A = Y intercept.

Equation #2: The second prediction, project-specific Teacher-training (X_2) will be entered into the equation. This variable is entered second since this is the second variable of interest in the study and in the project itself:

$$Y = A + B_1X_1 + B_2X_2$$

Equation #3: Teacher Quality (X_3) is entered into the equation. Of the remaining variables, this is assumed to locally have the most direct impact on the dependent variables hence it is entered third into the equation.

$$Y = A + B_1X_1 + B_2X_2 + B_3X_3$$

Equation #4: School Characteristics (X_4) is entered into the equation. Of the non-project specific variables, this is assumed to have the least direct impact on the dependent variables. Hence, it is entered into the equation only at this point.

$$Y = A + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4$$

Equation #5: Socio Economic Status (X_5) is entered into the equation. Related studies have shown that SES explains a large part of the variance in the dependent variable - learning achievement. Its entry into the equation has been deliberately postponed to this point because the

above fact.

$$Y = A + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5$$

The semi-partial (part correlation) squared (sr_i2) at each stage is the increase in R^2. Associated with X_1 when all previously entered variables have been partialled. Thus an ordered partitioning procedure is made possible by:

$$R^2_{y.123...k} = r^2_{y1} + r^2_{y(2.1)} + r^2_{y(3.12)} + \ldots$$
$$+ ry^2(k.123...k) + r^2_{y1} + sr^2_{2.1} + sr^2_{3.12}$$
$$+ \ldots sr^2_{k.123...k-1}$$

At each step the increase (or change in R^2) which represents the amount of variance in Y that can be accounted for by X_i that is entered at that point will be examined. The change in $R^2(R^2_{y.12...k} - R^2_{y.12...k-1})$ can then be tested for each significance, i.e., whether it is significantly different from zero (t-test for sr_i).

CHAPTER III

THE DATA SETS

To test the impact assessment models described in the previous chapter, two sets of data were analyzed. The first of these part of the data bank created by the Textbook Board Secretariat (TBS). The second set of data was generated through a small project undertaken by the Notre Dame University Socioeconomic Research Center (NDU-SERC) in Cotabato City. To fully appreciate the statistical treatment to which these data sets were subjected, a comprehensive description is necessary.

A. The TBS Data

The TBS data files contain several data sets on the Textbook Project, mainly academic achievement test and field evaluation of the textbooks. The Monitoring and Evaluation Section of TBS has been conducting a series of data gathering activities since late 1978. Each subsequent research instrument has been altered to some extent in an effort to improve on the previous one but the basic areas of concern have not changed very much. The data sets generated by these activities are of varying quality and in different stages of "data cleaning". Some of them have been keypunched and stored on computer tapes.

Two basic data sets are found at the different levels of the MEC structure involved in the textbook distribution flow. These data sets are aggregated according to the relevant level, i.e. at the division level, the data are aggregated up to the division level. The two data

sets include all relevant information related to:

1. the titles and number of textbooks received to date;
2. the titles and number of textbooks distributed to date.

At the division level, the following additional data are aggregated, kept, and reported directly to the national level:

1) all relevant information related to the titles and number of textbooks in the division reserve;
2) all relevant information related to the titles and number of textbooks found with manufacturing defects;
3) all relevant information related to the titles and number of textbooks reported lost/damaged by the end of the schoolyear.

No data are kept at the district level since the distribution flow process skips this level.

Two of the above-mentioned data sets have their origin at the school level:

1) relevant information related to the titles and number of textbooks reported lost/damaged by the end of the schoolyear;
2) relevant information related to the titles and number of textbooks found with manufacturing defects. At the

classroom level, the teacher keeps records of such relatively rare instances as when textbooks are issued out to pupils to be brought home.

As indicated above, an elaborate monitoring and evaluation scheme has been developed and is now being implemented by the Research and Evaluation Division of the Textbook Board Secretariat. To date, this scheme has been implemented only for the Grade II level. The data sets generated are kept at the TBS computer files.

Three main files have been generated:

1) the control group file. The total number of cases in this file is 1,652 Grade I pupils;

2) the experimental group file. The total number of cases in this file is 902 Grade II pupils who were given both pre and post-tests on the subject areas under evaluation;

3) the adjunct group file. The total number of cases in this file is 1,546 Grade II pupils who were given post-tests on the subject-areas under study.

All the individual cases were drawn through a stratified random sampling scheme from the total national population of the relevant Grade levels (exclusive of pupils of private schools).

For the purposes of the ESIA/WID, the most appropriate data set for illustrating the proposed analysis model is file-named "ADJ79PO2", or the data on the "Adjunct Study Post Test-Grade 2". The sample is a group of 2,005 second grade students from 51 schools randomly selected from Regions I, II, IV, VI, VII, X, XI, XII and the NCR.

There is a total of 171 variables contained in the data set, including the 90 test items of the three academic achievement tests in Science, Mathematics and Pilipino (30 items each). From among these variables, the following were selected as components of the indicators for the areas of concern of the present analysis:

A. Academic Achievement

1.	SCISCOR2	Science test scores
2.	MATSCOR2	Mathematics test scores
3.	PILSCOR2	Pilipino test scores

B. Socioeconomic Status

1.	INCOME	Monthly family income
2.	FATEDU	Father's education
3.	MOTEDU	Mother's education

C. Teacher Quality

1.	TEACHAGE	Teacher's age
2.	EFFRATING	Teacher's efficiency rating
3.	SELRATING	Teacher's self-rating
4.	COURSE	Teacher's undergraduate degree

5.	TEACHEDU	Teacher's highest educational attainment
6.	INSERSCI	Hours of inservice training in Science
7.	INSERMAT	Hours of inservice training in Mathematics
8.	INSERPIL	Hours of inservice training in Pilipino

D. School Quality

1.	LOCATION	Location of school
2.	PUPILPOP	Schools pupil population
3.	CLASSROOM	Number of classroom
4.	FACULTY	Number of teaching staff
5.	NEARSCH	Number of nearby schools
6.	SECTIONS	Number of section in grade 2
7.	CLASSIZE	Number of pupils in the class

E. Textbook Utilization

1. Science

a)	SCIRTY	Tryout class in science
b)	SCITMUSE	No. of weeks the teachers used the teacher's copy for science
c)	SCIRATIO	Book to pupil ratio for Science 2
d)	SCITXUSE	No. of weeks the pupil used the Science 2 textbook
e)	WKSCI	No. of weeks the pupil used the Science 1 textbook
f)	SCIIDIST	Book to pupil ratio for Science 1

2. Mathematics

a)	MATTRY	Tryout class in Mathematics
b)	MATTMUSE	No. of weeks the teacher used the teacher's copy for Mathematics
c)	MATRATIO	Book to pupil ratio for Mathematics 2
d)	MATTXUSE	No. of weeks the pupil used the Mathematics 2 textbook
e)	MATIDIST	Book to pupil ratio for Mathematics 1

3. Pilipino

a)	PILTRY	Tryout class in Pilipino
b)	PILTMUSE	No. of weeks the teacher used the teacher's copy for Pilipino
c)	PILRATIO	Book to pupil ratio for Pilipino 2
d)	PILTXUSE	No. of weeks the pupil used the Pilipino 2 textbook
e)	WKPILI	No. of weeks the pupil used the Pilipino 1 textbook
f)	PILIDIST	Book to pupil ratio for Pilipino 1

Note that for Textbook Utilization, there are three groups of variables corresponding to the three subject areas for which TBS has completed the production and distribution of textbooks, i.e., Science, Mathematics, and Pilipino. Note that some of the pupils included in the sample had been exposed to two other textbook related activities: the tryout and the Grade 1 textbooks. Finally, note that the book to pupil ratio, actual number of weeks use by the pupils and the teacher's use of the teaching guide are variables. These are functions of distribution

delays, mis-estimates on the number of pupils in a class, and a host of other factors that can not be controlled by TBS.

Teacher quality contains variables on the amount of training a teacher has had specific to each of the subject areas. One could argue that, therefore, teacher quality should be divided in such a way as to correspond to those three areas. We opted for the alternative of lumping these training variables into one that groups together general teacher quality, and this for two reasons: first, at Grade 2 the same teacher teaches all of these subjects, and second, we want to capture the commonly accepted educational theory of "transfer of training". Thus, the training in one subject area often flows into another area and affects the teaching quality in that subject area.

The Measures of Academic Achievement

The data contain two sets academic achievement measures in Science, Mathematics, and Pilipino the grades given by the teacher range from 1 to 4 which are categories of descriptive judgements from poor to excellent. The TBS test scores range from 0 to 25. The population averages are as follows:

Table 3

Mean Academic Achievement Scores

	SCHOOL GRADES	TBS TEST SCORES
Science	1.98	17.64
Mathematics	2.02	14.67
Pilipino	2.12	16.12

Overall, the two measures indicate about the same idea: the average pupil is "passing" and, on the TBS test, they score about 60 percent correct. In other words, the "average" pupil is average. Notice, however, a slight difference between the school grades and the TBS scores in the ranking among the three subject areas. School grades indicate that the pupils scored lowest in Science. But on the TBS scores, Science has the highest mean score.

It is difficult to attempt an explanation for this. Obviously, the school grades and the TBS tests are either measuring different academic skills or are different measures for the same skills. The differences among these measures are highlighted even more when one studies the intercorrelations among them.

Table 4

Correlations Among TBS Test Scores

SCISCORES2	X	MATSCORE2	=	.78
	X	PILSCORE2	=	.70
MATSCORE2	X	PILSCORE2	=	.71

Table 5

Correlations Among School Grades

SCIMARK	X	MATH MARK	=	.95
	X	PILMARK	=	.95
MATHMARK	X	PILMARK	=	.94

Table 6

Correlations Among TBS Test Scores
And School Grades

	SCISCORE2	MATSCORE2	PILSCORE2
SCIMARK	.32	.26	.30
MATHMARK	.33	.27	.31
PILMARK	.32	.27	.30

The TBS test scores show that there is a high correlation among pupil achievements in Science, Mathematics and Pilipino. This especially high for Science and Mathematics, as expected. But note that among the school grades, the correlations are so high that one would suspect that school grades measuring exactly the same academic skills; or that teachers are teaching about the same academic skills; or that they did not develop evaluation instruments that can capture differences among academic skills in Science, Mathematics and Pilipino. Whatever it may-be, there is something wrong with school grades on the assumption that skills in the three academic areas are not only different but also that they are found in different degrees in one individual. In other words, the school grades, if taken seriously, would describe the elementary second grades as one who knows just about as much in Science as he or she does in Mathematics and Pilipino and vice versa.

The intercorrelation between school grades and the TBS test scores are relatively low. This confirms the earlier observation that the two are either measuring different sets of academic skills or that they are very different measures of the same set of academic skills. From the previous observation on school grades, one should favor the TBS test scores as the more accurate measure.

The amount of variance explained by home background variables, (Mother's education, Father's education, income), however, are not too different (Table 5). As has often been mentioned, it is these background variables which have been found to explain most of the variance in

academic achievement scores. Later in this analysis, these variables will be computed to form the school-related measure of socioeconomic status (SES).

Table 7

Percent of Variance Explained by Home Background Variables

	School Grades			TBS TEST		
	SCIMARK	MATHMARK	PILMARK	SCISCORE2	MATHSCORE2	PILSCORE2
MOTEDU	17.5%	18.3%	18.0%	18.6%	16.6%	16.5%
FATEDU	13.2%	14.4%	13.8%	17.5%	17.5%	14.3%
INCOME	2.6%	3.2%	2.2%	1.6%	1.6%	4.4%

The magnitudes of these statistics are within the range of the findings of most other previous studies, except for **INCOME.** The amount of variance explained by INCOME is often higher than the magnitudes listed above. This is probably due to the poor quality the income data in the TBS data set.

The evaluation staff has made some preliminary analyses on the test score of Grades 1 and 2. Their findings show that there are small but statistically significant differences between the mean scores of the experimental and control groups in the three subject areas tested: Mathematics, Pilipino and Science. The tables below summarize these findings:

Table 8

Differences between Grade I Control and Experimental Group Post-tests, Philippine Textbook Project Evaluation, SY 1977-78

		$\bar{X}$	sD	n	t	df
Mathematics	Control	12.05	424	1594	6.01	2721
	Experimental	13.13	4.86	1128		
Pilipino	Control	13.00	4.79	1594	9.43	2721
	Experimental	14.88	5.34	1128		
Science	Control	12.24	4.12	1594	9.43	2721
	Experimental	14.87	4.87	1128		

Table 9

Differences between Grade 2 Control and Experimental Group Post-test, Philippine Textbook Project Evaluation, SY 1977-78

		$\bar{X}$	sD	n	f	df
Mathematics	Control	13.98	4.37	1601	63.87	2/2719
	Experimental non-pre-tested	15.12	4.65	328		
	Experimental pre-tested	16.20	5.34	902		
Pilipino	Control	15.43	5.00	1601	22.90	2/2719
	Experimental non-pre-tested	15.99	5.34	218		
	Experimental pre-tested	16.88	5.34	902		
Science	Control	15.95	4.42	1601	142.39	2/2719
	Experimental non-pre-tested	19.15	4.83	218		
	Experimental pre-tested	18.92	5.23	902		

B. The Micro Survey Data

An examination of the existing monitoring and evaluation schemes and the corresponding data sets shows that said scheme skip over the most important organizational level in the public elementary education system, i.e. the district level. The regular supervisory and evaluation program of the system is based at this level; authority to effect adaptive changes in higher level programs implementing strategies is already possessed at this level; action at this level has immediate and direct impact on classroom instructions.

The analysis done by the TBS Research and Evaluation Division on the data sets generated by its evaluation scheme shows that textbooks have statistically significant impact on pupil's achievement. Said impact, however, is quite small and not at all impressive. This findings, however, runs contrary to the commonsense judgment of pupils, parents, and educators themselves. Perhaps the source of this apparent contradiction lies in the inaccuracies of the measures used in the TBS evaluation.

For example, the TBS measure for textbook utilization is the pupil:book ratio. This assumes, among others, that given the 2:1 ratio, pupils are exposed to and use the textbooks in exactly the same manner. The preliminary survey conducted by the investigators showed that even with the 2:1 ratio, the mode and length of pupil's exposure to the textbooks vary highly along classes and teachers.

The TBS analysis also studied the various other factors usually assumed to be contributory to pupils' achievement level. The result very much mirrors the results of similar studies conducted abroad and here

in the Philippines. Such factors as Socio-Economic Status, Teacher Quality are shown to explain most of the variance in pupils' achievement. However, for purposes of devising relevant action programs, it is not enough to know the existence of such contribution. It is as necessary to know how said factors operate in practice to effect his contribution.

Given that, for example, at this stage of national development, a large majority of pupils have parents of low educational attainment; what possible action program is suggested by the finding that most likely such pupils will have low achievement level? However, if some understanding can be gained regarding the process by which parents' educational attainment contribute to low achievement, a possible preventive or corrective program can be devised. This requires, however, more in-depth data gathering and data analysis.

The local survey was therefore undertaken with the following objectives in mind:

1. to explore alternative monitoring and evaluation scheme for the Textbook Project which will be most effective and practical at the district level;
2. to arrive at more refined indicators for the variables included in the TBS evaluation;
3. to study in-depth the process through which said variables operate to effect their contribution to pupils' achievement level.

The local survey focuses on the following variables:

1. Textbook Utilization. The TBS study makes use of pupil: textbook ratio as its indicator for textbook utilization. The proposed survey will look at the various modes of textbook utilization in practice.

2. Teacher Quality. The TBS study makes use of the following indicators among others: number of hours of in-service training, awareness of SOUTELE findings, etc.. The proposed survey will study more in-depth these indicators as well as try to establish other and hopefully more accurate indicators.

3. Pupils Background. The proposed study will investigate in-depth the process through which the given indicators operate to affect pupils' achievement.

4. Classroom Climate. Through actual observations, the proposed study will hopefully surface other and more significant indicators than those included in the TBS scheme.

An initial sample of 30 teachers was randomly drawn from the teacher population of one urban and one rural school districts. These two districts were drawn from two divisions, one district (urban) from the Cotabato City division and the other (rural) from the adjoining North Cotabato division. The pupils of the sample teachers were then

taken as samples for the class study.

The pupil respondents used in the micro survey were the Grade III pupils in the two areas. The pupils were on the average around eight (8) years old and were grouped by class based on academic achievement. This grouping by average grade is more pronounced in the city where the maximum number of Grade II classes is 8 compared to only 4 in the rural area. Thus, the urban classes tend to be composed of pupils with similar academic achievement in their previous grades while the rural classes tend to have a more varied composition.

These figures also show that there is not much difference in sex in terms of educational opportunities up to grade VI level. However, women tend to lag behind at higher levels. This is probably due to the preference given the men since they are the acknowledged breadwinners in the family unit.

The rural-urban difference in educational opportunities is also evidenced by the results that there are more brothers/sisters in the urban areas who are still going to school compared to the rural average, (2.88 2.63). Considering that the number of brothers/sisters living with parents is less in the urban area ($\bar{X} = 4.64$) compared to the rural area ($\bar{X} = 5.03$).

Occupation of Parents:

The fathers of pupils in the urban area have a variety of occupation compared to the rural areas where 64.7% of the pupils have fathers who are farmers. The 5 leading occupation held by fathers in the urban area are:

1. driver - 22.3
2. clerk - 14.3
3. farmer - 7.0
4. storekeeper - 5.7
5. carpenter - 5.7

These account for only 55% of pupil respondents.

The mothers, on the other hand are mostly housekeepers - 50% in the urban area and 72% in the rural area. The other 50% of mothers in the urban area have work that varied from: storekeeping (12.7%), clerk (9.7%), teaching (9%), and dressmaking (5.3%). In the rural areas, those who are not purely housekeepers help in the farms (9.3%), are teachers (3.7%) or dressmakers (2.7%).

The socio-economic status of pupils were determined by asking them their parent's educational attainment, parents' educational attainment, parents' occupation, and the ownership of consumption goods.

Educational Attainment of Parents:

Most of the respondents had parents who had at least 6 years of education. In both rural and urban samples the majority (60% to 70%) indicated that their parents reached Grade VI and above. Surprisingly, there were more pupils in the urban area whose parents had no formal education. They comprise 6% for the fathers and 15% for the mothers. The rural pupils were only 1.3% and .3% respectively.

The rural-urban difference is more pronounced at higher educational levels. Half of all the urban pupils (51.4%) have fathers with at least 4th year high school education. This was only slightly lower in the case of mothers (41.0%). In the other hand, among the rural pupils, only 24.4% have fathers with at least 4th year high school education and 24.0% in the case of mothers.

These figures are much more lower at the college level where 25.1% among urban pupils had fathers reaching 4th year college compared to only 5.3% in the rural areas. This pattern is the same with mothers 20% in the urban areas and 5.3% in rural areas.

These figures give credence to the observation that there are more educational opportunities in the urban areas. Although there are still people with no formal education especially among the urban women, everyone has access to formal education up to Grade VI. After this level, educational opportunities are confined in the urban areas.

Only 53% of the farmers in the rural areas own the land they cultivate compared to the 81% of farmers in the urban area. The area they cultivate is also proportionately lower ($\bar{X}$ = 2.21) than in the urban area ($\bar{X}$ = 3.4).

Other Socio-economic Indicators

The pupil respondents were asked to point out which among the following items were found in their homes:

car

tricycle/motorcycle

television

radio

refrigerator

stereo

gas or electric stove

magazines

newspapers

In the urban area, more than 50% of the pupils indicated ownership of radio - 86.0%; newspapers - 58.7%; and magazines - 51.7%. These were followed closely by gas/electric stove - 47.3% and television - 41.7%. In the rural area, the only item owned by majority of the respondents is the radio - 74.7%. A small number own items such as newspapers - 24.7%, stove - 20.3%, and stereo - 19%.

Teachers' Profile

The teacher respondents of the micro survey were all female. They have been in the teaching profession for a relatively long period - an average of 14.3 years for the teachers in the urban area and 17.8 years for those in the rural area. They have spent 82% of the time handling Grade 2 class (for urban) and 78% (among the rural teachers). A small number have temporary status - 6.7% in the urban and 13.3% in the rural area. New teachers are usually assigned to the rural areas where vacancies often exist.

Although the rural teachers have more teaching experience on the average than the urban sample, the latter have more access to educational opportunities. More urban teachers have MA units (53.3%) and have passed the civil service examination (86.7%) compared to the rural sample - 40% and 60% respectively.

Most of the teachers (86%) were trained on the use of textbooks. The rest (13%) who were not trained all came from the rural area. Those trained found the seminar very useful in teaching with the new textbooks.

The dialect spoken by the teachers at home varied greatly in the urban area. Forty percent spoke Tagalog, and the rest were Ilocano, Ilongo, Cebuano, or Chavacano speaking. In the rural area, most (93.3%) of the teachers spoke Ilongo.

Medium of Instruction

Of the 5 major subject areas taught in Grade II, Science and Mathematics are taught in English while Social Studies is taught in Pilipino. These languages were used strictly as the medium of instruction in both rural and urban schools. The other two subjects English and Pilipino - were sometimes taught with the use of the pupils' dialect. In the rural areas, a big percentage (46.7%) teach English with the help of the local dialect. Only 26% in the urban area rely on the help of the local dialect; most of the teachers (60%) teach English with the help of the Pilipino language.

Table 10

Percent Use of Language Mix in Teaching English and Pilipino Subjects

	Urban		Rural	
	English	Pilipino	English	Pilipino
with local dialect	26.7	33.3	46.7	33.3
with English/Pilipino	60.0	60.0	33.3	46.7
NA	13.3	6.7	20.0	20.0

The predominant use of the dialect in teaching in the rural area is due to the commonality of the Ilongo dialect among pupils and teachers unlike in the urban area where Pilipino has to be used for lack of a common medium of communication.

School Characteristics

The sample schools in both areas were taken from the list of public schools in the 2 districts. A discrepancy already exists from the start among samples due to the overcrowded conditions of schools in the urban area. Multiple sections exist in one grade level - sometimes reaching 10 sections in one urban school compared to only two or three sections in a rural school. The average class size in the urban area is 53 while the average class size in the rural area is 39. The ratio of teachers to pupils also differs in the two areas.

Table 11

Teacher/Pupil Ratio in Sample Area

	Urban	Rural
School level	1:40	1:30
Grade II level	1:50	1:34

This shows that the teacher-pupil ratio is higher in the urban areas, further aggravating the already high classroom-pupil ratio.

However, in terms of other resources available to help in the learning process, the urban schools are better off than the rural schools. The teachers in the urban schools rated their resource materials and teaching aids higher than the rating made by the rural teachers.

Textbook Utilization

All the teachers of Grade II classes interviewed during the survey have received the complete set of textbooks from EDPITAF. The number of textbooks received even exceeded the original target of the project - which is to supply one textbook for every two pupils. Survey results showed that the textbook-pupil ratio in the urban schools is 1:1.5 (approximately 2 books for every 3 pupils per subject). The ratio in the rural area is almost similar to the target - 1:1.9. The teachers claim that all the books received are being used.

However, the use of books outside class period differs among teachers and among subjects. Generally, only 80% of the teachers in the urban area allow the use of books outside class period. In the rural area, only 60% allow this practice. It is also worth noting that in both urban and rural areas, a relatively much lower percentage of teachers allow science textbooks to be used outside the class period.

The survey also showed that both urban and rural teachers are strict in allowing pupils to bring the books home. On the average, only 40% in both areas allow the practice. The pupils in urban areas who are allowed to borrow the textbook can keep the book at an average of 2 days per week while the pupil in the rural area is allowed from 3 to 5 days. The books are being used regularly by the teachers and these are used as basis for seat work and class exercises.

Test Results

The mean scores achieved by pupils in the test given for 5 subject areas are shown below:

Table 12

Pupil Mean Score by Subject

	Urban	Rural
Language	15.27	15.45
Reading	14.85	15.25
Mathematics	18.71	18.01
Pilipino	22.46	18.53
Science	17.35	20.30

It would be noted that the pupils from urban schools scored highest in Pilipino while those from the rural schools scored highest in Science. The factors that may possibly influence these variations will be discussed in detail in the next chapter.

CHAPTER IV

DATA ANALYSIS

Two sets of data, therefore, were used to assess the impact of the textbook project upon the various areas of ESIA/WID concern, i.e., the data gathered by the TBS Monitoring Staff and the data gathered by the micro-survey. The variables contained in the two data sets do not exactly correspond to each other. They are not supposed to. The micro-survey was undertaken precisely to improve and simplify the data collection process and the measures used for assessing the impact of the textbooks. Secondly, the micro-survey was undertaken after the field try-out period of the textbook project. Hence there are no data on try-out activities which correspond to those gathered by the TBS Monitoring Staff.

However, the main conceptual framework of analysis are similar to each other. The impact of textbooks upon student learning was assessed relative to intervening factors measured by both studies: student home background, school quality, teacher quality and variations in the actual use of the textbooks.

A. Analysis of the TBS Data

Data Reduction

Because of the large number of variables that has to be dealt with, an attempt was made to combine the variables into a smaller number of multi-dimensional composite scales or indices. There are a number

of techniques available for this purpose. This study made use of the factor-analytic method. The variables were first grouped into blocks which measure a conceptually relevant concept. These groups of variables were then factor analyzed. After the terminal solutions were obtained, a composite scale was created using the factor-score coefficients as weights in the computation of the scale or index score for each respondent. The result is therefore a weighted composite measure that represents the theoretical dimensions associated with the variables of interest for the analysis.

Below are the results of the factor analytic solutions for SES, Teacher Quality, School Quality, Textbook Utilization for Science, Mathematics and Pilipino.

Table 13

Factor Score Coefficients for SES Variables

INCOME	0.33061
FATEDU	0.43082
MOTEDU	0.42881

Eigenvalue = 2.08%
Pct. Var. Exp. = 69.6%

The SES variables from one simple linear combination which explains 69.6% of the total variance among them. Father's and mother's education have approximately equal factor loadings which are both higher than that of family income. One should therefore think of the resultings SES index as essentially measuring the combined educational background of the pupil's parents together with, but to a lesser degree, the family's total monthly income.

Table 14

Factor Score Coefficients for Teacher Quality Variables

	FACTOR 1	FACTOR 2
TEACHAGE	0.02596	-0.37988
EFFRATING	-0.08670	-0.17307
SELRATING	-0.02642	0.17307
INSERPIL	0.34177	0.01048
INSERSCI	0.38230	-0.03677
INSERMAT	0.38020	0.01783
COURSE	0.3790	0.40832
TEACHEDU	-0.00822	0.45200
Eigenvalue = 2.62%		Eigenvalue = 1.91%
Pct. Var. Exp = 32.8%		Pct. Var. Exp. = 23.9%

Two orthogonal factors are extracted from the teacher quality variables. The first explain 32.8% of the total variance and the second explains 23.9% more. Cumulatively, therefore, the two variables explains up to 56.7% of the total variance.

The first factor is heavily loaded with the inservice training of the teachers in Science, Mathematics, and Pilipino. The second factor consists mainly of contributions from the teachers educational attainment, the undergraduate degree attained by the teacher and the teacher's age. To a much lower degree, the efficiency rating and the self rating of the teachers also contribute to the second factor. "Teacher quality" has therefore been split into two scales: one measuring the amount of inservice training, and the other measuring the teachers educational qualifications and efficiency ratings.

Table 15

Factor Score Coefficients for School Quality Variables

	FACTOR 1	FACTOR 2
SECTIONS	0.23650	-0.09462
LOCATIONS	0.19255	-0.09933
PUPILPOP	0.23170	0.10777
CLASSROOM	0.23229	0.00832
FACULTY	0.18818	0.12015
CLASSIZE	0.6597	0.78132
NEARSCH	0.11870	-0.55851
Eigenvalue = 3.93%		Eigenvalue = 1.03%
Pct. Var. Exp. = 56.1%		Pct. Var. Exp. = 14.8%

The school quality variables, like those of teacher quality, decompose into two factors. The first factor which explains 56.1% of the variance, is a composite of the number of sections in grade 2, the pupil population of the school, the number of classrooms, the location of the school and the size of the faculty. The second factor, which explains only 14.8% more of the total variation is basically a measure of the size of the class to which the pupil belongs and the number of nearby schools. Cumulatively, the two factors explain 70.9% of the combine variance among the seven variables.

Table 16

Factor Score Coefficients for Textbook Utilization Variables in Science

SCITRY	0.19977
SCITMUSE	0.24389
SCITXUSE	0.24480
SCIRATIO	0.21825
WKSCII	0.20276
SCIDIST	0.22821

Eigenvalue = 3.33%
Pat. Var. Exp. = 55.5%

The Science textbook utilization variables load almost equally. The factor has a high eigenvalue of 3.33 and explains 55.5% of the total variation.

Table 17

Factor Score Coefficients for Textbook Utilization Variables in Mathematics

MATHTRY	0.22297
MATTMUSE	0.44663
MATTXUSE	0.43888
MATRATIO	0.21914
WKMATI	-0.16263
MATIDIST	-0.14932

Eigenvalue = 3.26629
Pct. Var. Exp. = 54.4%

In the case of Mathematics, textbook utilization variables the factor loadings are unequal. The number of weeks the pupils used the Mathematics I textbook and the distribution ratio of those textbooks have an almost negligible and negative contribution to the total scale value. The extent of actual use by the students and the teacher of the instructional materials load highest.

Table 18

Factor Score Coefficients for Textbook Utilization Variables in Pilipino

PILTRY	0.22024
PILTMUSE	0.38446
PILTXUSE	0.38785
PILRATIO	0.32650
WKPILI	-0.17135
PILIDIST	-0.12132

Eigenvalue = 3.27161%
Pct. Var. Exp. = 54.5%

The statistical configuration of the Pilipino textbook utilization variables are very similar to that of Mathematics. In the case of Pilipino, however, the book to pupil ratio is as important as the actual use of instructional materials by both students and teachers.

The Regression Analysis

After computing the index or scale score for each individual pupil, a series of regression equations on the TBS test scores were computed using the newly created variables as predictors. The purpose is to estimate the unique contribution of each predictor to the explanation of the variance in the TBS test scores. The central variables of interest are of course, Science, Mathematics and Pilipino textbook utilization (TUSCI, TUMATH, TUPIL) and teacher quality (TQ1 and TQ2)

A combination of hierarchical and stepwise regression procedures were used. This was to accommodate, first, the theory-based priority ordering of the predictors in the following hierarchical orders: Textbook Utilization, Teacher Quality (TQ1 and TQ2), School Quality (SQ1 and SQ2) and Socioeconomic Status (SES). Second, a stepwise mode was used because the predictors "Teacher Quality" and "School Quality" are split into two indices, as suggested by the results of the previous factor analysis.

The three tables below present the pertinent regression statistics for the TBS test scores in Science, Mathematics and Pilipino. There were six regression equations computed for the test scores of each subject area. The predictors were entered one at a time. The corresponding Beta weights

are shown in the tables below, and these are intuitively interpreted as the "unique" contribution of the variable to the explanation of the variance in the dependent variable (the TBS Test Scores). The R^2 for each equation are also indicated in the tables because they are estimates of the proportion of the total variance that is explained by all of the variables entered in the regression equation.

Table 19

Stepwise Regression Statistics for Pilipino

	Beta Weights					
Variables Entered	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Textbook Utilization	.228	.174	.169	.067	.063	.081
Teacher Quality (2)		.128	.128	.028	.026	.005
Teacher Quality (1)			.016	.001	.003	.002
School Quality (2)				.547	.520	.457
School Quality (1)					.042	.018
SES						.264
	R^2=.052	R^2=.065	R^2=.066	R^2=277	R^2=278	R^2=331

Table 20

Stepwise Regression
Statistics for Science

Variables Entered	Beta Weights					
	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Textbook Utilization	.466	.383	.365	.167	.155	.134
Teacher Quality (2)		.212	.211	.151	.154	.137
Teacher Quality (1)			.059	.057	.062	.064
School Quality (2)				.376	.415	.367
School Quality (1)					.050	.100
SES						.212
	R^2=.217	R^2=.255	R^2=.258	R^2=.347	R^2=349	R^2=.383

Table 21

Stepwise Regression
Statistics for Mathematics

Variables Entered	Beta Weights					
	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Textbook Utilization	.385	.355	.305	.119	.116	.086
Teacher Quality (2)		.146	.142	.117	.121	.121
Teacher Quality (1)			.112	.068	.069	.056
School Quality (2)				.361	.397	.351
School Quality (1)					.057	.108
SES						.225
	R^2=.148	R^2=.169	R^2=.178	R^2=.262	R^2=.264	R^2=.303

A number of interesting changes happen as variables are hierarchically entered into the equation.

1. The beta weight of Textbook Utilization in all of the three subject areas reduce dramatically as more predictors are entered into the equation.
2. The largest amount of change occurs during step 4 when School Quality (SQ2) is entered into the equation
3. Reductions in the magnitude of the beta weights also occur in the other variables that have been included in the equation prior to the entry of SQ2 at Step 2.
4. The entry of Socioeconomic Status (SES) has a fairly large impact upon the magnitudes of the beta weights of variables that preceded it. SES reduces even the beta weights of SQ2 itself.
5. The R^2 increases as more and more variables are entered into the equation. This is to be expected. But sudden jumps are observed upon the entry of SQ2 and SES in steps 4 and 6.
6. In the last equation, after all of the predictors have been included, the unique contribution of Textbook Utilization is almost negligible. The two most important explanatory predictors are School Quality (2) and Socioeconomic Status.

SQ2 is the second factor extracted from the set of school quality variables. It consists mainly of the measures of class size and the

number of schools that are near the school used as a test site for the evaluation activity. One might interpret this predictor as measuring the size of the educational milieu of the school and the intensity of teacher-student contract. Compared to measures of teacher training (TQ1) and textbook utilization, there appears to be no a-priori or theoretical reason for expecting that this variable would behave in the way it does. Several other educational studies seem to indicate that class size does not make any outstanding contribution to the explanation of measured academic achievements.

The researcher is forced to theorize that the impact of the other aspects of education are focused by the intensity of teacher-student relationship, on the one hand, and by the size of the educational milieu of the student on the student on the other hand. In other words, it may be that the factors that contribute to learning are all catalyzed and coordinated by teacher-to-student and student-to-student interaction.

To return to the original interest of this analysis, it is clear that textbook utilization and teacher quality contribute at most a less than substantial contribution to the explanation of variables in the TBS test scores. Whatever contributions these two predictors might have are essentially mediated by the intensity of student-to-student and teacher-to-student interaction. These findings take one back to some very trite and traditionally definitions of the educational process, as being essentially one of human relationship. The data of course limit us to the early years of the education of the young.

The Alternative Hierarchical Procedure

An alternative model was explored whereby the hierarchical entry of variables was reversed. This was done to test the possibility that the entry of SES before Textbook Utilization may have confounded the impact textbook utilization. In the previous analysis, the textbook utilization variable was entered first and then the other environmental factors were entered. In the present model, SES was entered first, then school quality, teacher quality and finally the textbook utilization measure was entered. The three tables below present the results of these computations.

Table 22

Stepwise Regression Statistics for Mathematics

	Beta Weights					
Variables Entered	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
SES	.39	.22	.24	.24	.23	.22
SQ 2		.38	.43	.41	.39	.35
SQ 1			.10	.11	.11	.10
TQ 1				.13	.13	.12
TQ 2					.08	.05
TUMATH						.09
R^2	.15	.26	.28	.29	.30	.30

Table 23

Stepwise Regression Statistics for Science

	Beta Weights					
VARIABLE	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
SES	.41	.21	.24	.22	.22	.21
SQ 2		.44	.51	.45	.45	.36
SQ 1			.12	.12	.13	.10
TQ 2				.17	.16	.14
TQ 1					.09	.06
TUSCI						.13
R^2	.17	.33	.34	.36	.37	.38

Table 24

Stepwise Regression Statistics for Pilipino

	Beta Weights					
VARIABLE	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
SES	.44	.25	.26	.25	.25	.26
SQ 2		.41	.42	.41	.42	.46
SQ 1			.01	.01	.01	.02
TQ 1				.02	.02	.00
TQ 2					.01	.01
TUPIL						.08
R^2	.19	.32	.33	.32	.33	.33

As expected the beta weights in the final solution (Step 6) do not differ from the magnitudes arrived at using the previous model. Second, the amount of variance in the academic achievement scores explained by all of the variables in the final equation at Step 6 is the same as in the previous model. There are, however, a number of interesting results.

1. The contribution of SES in explaining variations in academic achievement scores is up to 44%. But with the entry of school quality, this figure reduces quite substantially.

2. The amount of variance in the equation explained by SES is only up to 19%. But with the entry of SQ 2, this goes up to a maximum of 32%.

3. The beta weights of all the other variables in the equation are relatively small. Likewise, the additional R^2 resulting from the entry of other variables beginning at Step 3 are negligible.

These findings reconfirm the results of other studies which point to the overriding importance of social and economic factors in the learning process. The quality of the students' home environment and the type of schools they attend almost exclusively explain how much and what they learn from the educational system. The process seems to be that those who come from more favored home environments tend to go to better schools. In turn they perform much better in academic achievement tests.

One might have expected that the measures of teacher quality would do better in the regression computation. It turns out that the statistical impact of these variables is relatively small. One reason might be the quality of the measures used. This is always a possible explanation for any unexpected statistical results. In the present case, this may have something to do with the fact that the measure of teacher quality are made-up of "inputs" to being a good teacher, i.e., degrees, seminars, age and experience. The more direct measures of teaching efficiency are often not used because of the difficulty of gathering data on them. These would include intellectual and aptitudinal characteristics which are more directly required for good teaching.

The textbook utilization variables also do poorly in the regression equations. Again one can fault the accuracy of the measures used. But many other studies show that textbooks do not statistically contribute much to the explanation of variations in academic achievement scores. However, it is simplistic to conclude that textbooks are useless in the learning process. What these findings underline and the quality of the schools which students attend and within which textbooks are used.

B. The Micro-Survey Data Analysis

The micro survey was undertaken to find out if simpler and more observation-type data could be gathered. It was hoped that this would improve the quality of data that might be useful for counterchecking

the data gathered on a nationwide level. Two areas of improvement were targetted: the textbook utilization measures and school quality.

Textbook utilization measures were identified as priority area because this was the most important criterion variable in the analysis of the impact of textbooks upon learning. It was felt that the mere delivery of textbook to the school site was too gross and rough a measure. The more important question was whether or not the textbooks were used, and how they were used.

The micro-survey confirmed that in fact the textbooks were used by the teachers. But many of the teachers were so afraid that the textbooks would be damaged or lost that they did not all allow the students to bring them home. Besides, there were not enough books for every student in most of the schools. Hence, most of the time the textbooks were distributed during the class and retrieved right after the class period.

Some teachers allowed their pupils to bring their books home by turn to give everyone a chance. The figures below give some idea of this method of textbook utilization:

Table 25

Percent of Teachers Reporting that they allowed their Students to bring their textbooks home, by subject area.

Pilipino	48.3%
Mathematics	29.8%
Science	28.6%

The second measure of textbook utilization decided upon was the number of days that a pupil is allowed to bring their books home. The average is two days. Some of the teachers also allowed their students to use the textbooks outside of class hours but within the school building. This data was used as one more indicator of textbook utilization.

School quality was measured by the composite score of ratings made by trained researchers on various aspects of school and curricular facilities: library, periodicals, references, course of study, teacher's guides, teaching aids, behavioral objectives, laboratories, classroom facilities, etc. Each of these were rated "Inadequate, Barely Adequate or Adequate". The ratings were given values 1 to 3 and then summed up to compose the Overall School Rating (OSR).

These measures were in addition to those used by the TBS Monitoring staff although not all of their measures were used by the micro-survey. It was felt that there was too much superflous data included in their questionnaire. The micro-survey tried to reduce the quantity of data gathered but tried to gather them accurately through more prolonged indepth observations by trained researchers.

Regression equations were computed on each of the academic achievement scores on Mathematics, Pilipino and Science. A combination of hierarchical and stepwise methods were used. The independent variables were grouped into conceptual blocks and entered hierarchically. The student background variables were entered first, then school quality, teacher quality and finally the textbook utilization variables. The

variables within the block were entered in stepwise fashion such that those variables with the highest predictive capability were first allowed to explain the variance on the criterion variable and so on down to the variable with the least predictive capability.

Below is the list and description of the independent variables used in the regression runs:

Block A: Background Characteristics

1. VAR002 = Father's educational attainment
2. VAR003 = Mother's educational attainment
3. CONITEMS = consumer items found in the student's home

Block B: School Qualities

1. VAR091 = class size or the number of students in the class.
2. VAR089 = the total school population
3. OSR = the overall school rating as judged by the researcher

Block C: Teacher Quality

1. VAR079 = the number of years that a teacher has been teaching
2. VAR080 = the number of years that a teacher has been teaching in Grade 2.
3. VAR081 = the highest educational attainment of the teacher.

Block D: Textbook Utilization

1. TBPR = pupil to textbook ratios
2. XCU = the proportion of students in a class who regularly use the textbook outside of class hours.
3. VAR054 to VAR058 = the number of days per week that a pupil is allowed to bring a textbook home.

Table 26

Beta Weights of Textbook Utilization Variables by Subject Area

Variables	Science	Mathematics	Pilipino
No. of days allowed to bring books home	N.S.	-.536	-.631
Extra classroom use	.954	.781	.895
Textbook-pupil Ratio	.449	-.604	N.S.

It is difficult to make a final judgment on these findings. The quality of the micro-survey data can be questioned. The sample was much smaller and localized in one region of the country. It may also be pointed out that the measures used in the micro-survey were different than those used in gathering the TBS data. All of these can be accepted. But these conditions do not necessarily affect the relationship between the variables used.

The results of the regression runs on the micro-survey data are very different from those obtained on the TBS data. Of course it is not possible to make a variable-by-variable comparison because the variables of interest (Background Characteristics, School Quality, Teacher Quality and Textbook Utilization) were measured in different ways. However, the overall impression that one gets from an examination of the patterns and magnitudes of the various statistics is that results of the two computations are almost diametrically different.

First of all, the total variance explained (R^2) by the regression equation is much larger in the micro survey data, as shown below:

Table 27

Total Variance Explained

	Data Set	
Subject Area	TBS	Micro-Survey
Science	38.3%	49.9%
Mathematics	30.3%	43.7%
Pilipino	31.3%	49.2%

The second interesting fact is that the block of textbook utilization variables contribute substantially larger magnitudes to the increases in variance explained as they are entered in hierarchical fashion, even after all of the other blocks of variables have themselves been entered into the equation. The table below tabulates the percent of variance explained by each block of variables for each subject area.

Table 28

Percent of Variance Explained (R^2) By Blocks of Independent Variables, By Subject Area

	Subject Area		
Variable Blocks	Science	Mathematics	Pilipino
Background (SES)	14.2%	27.8%	27.7%
School Quality (SQ)	20.0%	29.3%	31.7%
Teacher Quality (TQ)	32.7%	33.7%	40.1%
Textbook Utilization	49.9%	43.7%	49.2%

The third difference in the results of the regression analysis is that the textbook utilization variables consistently register higher beta weights when compared to the other variables in the case of the micro-survey data. The range of beta weight values for all other variables is .017 to .558. Compare this with the beta weight values of the textbook utilization variables summarized in the table below in the equation. That is, the magnitudes of the variable values may differ from one data set to another. But there is no internal necessity that the interrelationships of variables within each data set should differ.

In another sense, these differences were expected as a result of a deliberate attempt to improve on the quality of the data. The micro-survey was intentionally observational and in-depth. The data gathered were not just a result of paper-and-pencil questionnaires but were the results of prolonged interviews and observations by trained researchers. This was possible because the sample was very small when compared to that of the TBS data set.

All of these attempts to gather accurate data may have resulted in the reduction of random variations. Hence the magnitudes of the explained variance are substantially larger than that of the TBS data set.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

A. Impact on Areas of Concern

Among the ESIA/WID areas of concern, the most direct and salient impact of the textbook project is upon student learning. Its impact upon the other areas are mediated through improvement in the education and literacy levels of the country. The main analysis, therefore, has concentrated on that area of concern.

The Participation of Women in Development stands out as an area of concern that is quite directly affected by the textbook project. To begin with, there are slightly female students in both samples as there are males. This finding is not unique to this study since most every other educational data set from this country reveal about the same proportion of females to males in the educational system. It is surprising however in relation to the situation in other developing nations around the world where equal educational opportunities for women is still an ideal to be obtained.

The second interesting fact is that females tend to score higher in the academic achievement tests. The differences are not too large nor statistically significant in every subject area. However the trends are quite consistent. One could argue that females tend to perform better on paper-and-pencil tests, and that probably males tend to do better in actual job performance tests. But these are conjectures that need to be

verified and about which the data sets do not have pertinent data.

The target clientele of the textbook project are elementary and high school students ranging in age from 6 years old to 16 years old. It is therefore quite difficult to assess its impact upon Production and Productivity as an ESIA/WID area of concern. The impact on this area is a long term one. However, it goes without saying that increases in education and literacy, all other factors being equal, will lead to improvements in Employment and Income Growth. It is interesting to note that the data from both data sets show that the students sampled for the study have, on the average, already reached the educational level of their mothers. Data from other studies show that by the time students finish their elementary schooling they already have had more education than their parents.

There is another aspect of Production and Productivity which the textbook project has affected. This is the nation's ability to prepare and distribute textbooks on a massive scale. Much is left to be done. The quality of the textbooks' content has been criticized by some quarters. The quality of printing and binding has likewise been criticized. Finally, there were many delays in the production and delivery schedules. There are internal documents in the TBS Monitoring Staff files which describe these problems in detail. These documents understandably cannot be released for publication but the TBS does not deny the existence of these problems. However, they are quick to reply that these are expected problems inherent in a first attempt at a nationwide textbook production venture. Secondly there is ample evidence from World Bank documents that the

Philippine Textbook production project has fared much better than those of other countries. The overall outcome has in fact been satisfactory enough to justify a second round of activities on textbook production.

The nation's ability to fully utilize the textbooks is one more area of difficulty for the project. The teacher-training component has not been very successful. There are also bureaucratic constraints that have worked against the proper use of the textbooks. Accountability requirements, for example, are so stringent that many teachers would rather not allow the students to fully use the textbooks for fear of damage or loss which they have to answer for. Data on this will be presented in subsequent sections of this paper.

The overall assessment of the textbook project has been muddled by concerns over the role of the private sector. The development phase of the project has been implemented by government agencies. Whether this is more efficicient or not, the fact is that it has affected the initiative and viability of private textbook writers and publishing. This is a serious problem. The capability of the private sector for textbook production has been proven by its outputs over the past years, long before the textbook project come into being. This is now being threatened. A national policy has to be formulated in this regard because the production of textbooks is only one aspect of a national attitude towards the role of the private sector in the overall development of the country.

Income distribution is affected by the impact of textbooks upon student learning. In other words, the impact to the textbook project is

mediated by its more direct effect upon how much and what students learn. The effect turns out to be apparently counter-productive.

The results of the regression equations which are discussed below show that the social and economic status of the student's parents explain large proportions of the variance in academic achievement scores in every learning area tested. The impact of the textbooks is therefore mediated or affected by the antecedent characteristics of the student. The result is that students who come from more favored home backgrounds tend to profit more from the use of textbooks than those who come from less favored families. The net effect therefore, is that there appears to be a trend towards increasing gaps between the socioeconomic strata of the country with regard to the outcomes of education. Expectedly this trend would have repercussions later in terms of widening gaps in employability and hence, income distribution.

This is not a direct effect of the textbook project. It is an inherent phenomenon of the education system itself and of its relationship to social and economic factors. The present educational system tends to reinforce the existing socioeconomic stratification system. And textbooks are only one of the main components of the educational process.

The textbook project was intended to redress imbalances in the quality of educational facilities of the country, from a ratio of one set of textbooks for every 10 students to one set for every two students especially in the public school system. Those few (about 10%) of the population who go to private schools and who have more than enough of

textbooks and reference enrichment materials have not been included in the project. The project has potentials for accomplishing that supply objective. But then again, even within the public school system there are just as much home background disparities as there is for the country as a whole. The textbook project does not seem capable of decreasing the inequalities that arise from the educational system itself.

The content of the textbooks are deliberately designed to teach students about information and issues on population and fertility, environment, energy, health and nutrition. In the language of TBS documents, these ESIA/WID concerns are "integrated" into everyone of the textbooks that have been produced. The project may even be faulted by its over-concern for integrating these matters into the textbooks. There is a saturation point in the learning process. While there is no suggestion here that this saturation point has been reached, it should be pointed out that the integration of these subject matters into the content of the textbooks are quite noticeable even from a cursory reading of them.

The overall outcomes of the textbook project are expected to be in the affective and attitudinal areas of the students. We attempted to investigate these areas by analyzing the test items used by the TBS Monitoring Staff. The test items are designed to elicit information-level outcomes rather than those of the affective domains of learning. There are a few items that could be interpreted to test attitudinal learning. However we felt that it would be reading too much into the data if we

decide to use them as desired. In any case, given the present content of the textbook, it does not seem as if student attitudes will develop in any other direction than those intended by the producers of the textbooks. The full impact of what is learned now can only be fully assessed when students move up to social roles where they have to make decisions about the areas of concern that they are now taught through these textbooks.

B. Impact Analysis of Textbooks on Learning

The statistical analysis of the impact of textbooks upon academic achievement test scores resulted in different results. If one were to use the TBS data set, textbooks would have a relatively small contribution to the explanation of variance in test scores. The opposite is true if one examines the data gathered by the micro survey.

As far as the impact of textbook is concerned, the TBS data set reveals that whatever effects textbooks may have are mediated by the quality of the school, the students background characteristics, etc. The micro-survey data show that textbooks have an impact on learning which is independent from background and environmental variables, and that this impact is substantially larger than that of the other variables.

It is not possible to make a judgment on which data set is better. Both have their own advantage over the other. But the fact is that the results of statistical comparatives on them differ quite sharply.

Whatever may be the reasons, there is enough reason to propose that if further studies are to be made on the impact of textbooks on learning, and through learning upon other areas of development concerns, considerable effort should be made to improve the measures of textbook utilization. Pupil to textbook ratios are, for all practical purposes, of very little relevance unless some additional measure of how textbooks are used are included in the data gathering instruments.

Likewise, school quality measures must be improved. The sheer enumeration of physical facilities are of little use. These have very small significance with regard to learning. What is more important, are curriculum-related facilities such as teaching aids that are actually used.

Finally, measures of teacher quality need to be improved by way of focusing on measures of actual teaching competence. Educational attainment of teachers is of little use in this regard. There is a minimum requirement for teachers. Therefore, there is very little variability in educational attainment. The few "who have MA units" will not be able to increase variability to any statistically significant degree. Likewise, the number of hours of training in all kinds of seminars is not too useful. What is more important is the quality of those seminars and the quality of what seminar participants have learned.

Most education-oriented research projects invest large amounts of time, effort and money in the development of excellent measures of academic

achievement. Proportionately less is invested in the development of measures of those factors which are supposed to be related to academic achievements. But the quality of the results of statistical analysis is not dependent on the best indicators included in the analysis. It is rather dependent on the worst measures used by the study.

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A N N E X

II. MICRO SITE PROFILE

Geographical Location

Cotabato City and Pigcawayan are located in southwestern Philippines (ef. Map). Historically a population center since the pre-Spanish era, Cotabato City has maintained this status - both politically and economically - due to its strategic position on the mouth of the Rio Grande. In earlier days, the river was the major means of circulation among the settlements in the region. The city became the outlet for agricultural products from up-river and was the stronghold of the old stone for "Kuta Wato". The first is located on a hill which has a commanding view of traffic in and out of the city. Modernization has diminished the importance of the river transport but the area has already been built up as a center in the network of physical, social and economic facilities of the region.

Pigcawayan is an agricultural municipality, 26 kilometers east of Cotabato City. Due probably to its proximity to the city, it has remained rural in both to economic and social environment. Its location along the Rio Grande contributes to the high productivity of its fertile plains.

Socio-Economic Structure

The total land area of the city is 176 kilometers or 17,600 hectares of which only 10,900 is usable. Pigcawayan has 450 square kilometers all

of which is devoted to farming. Population in 1975 was 66,756 for Cotabato City. This provides a population density of 6,078 persons per hectare of usable land. On the other hand, Pigcawayan has a population of 26,845. The population is evenly divided by sex. It grows at an average almost unbelievable rate of 9% for the city and for Pigcawayan. Thus the area's population is highly heterogenous ethnically.

The biggest ethnic group in the areas is the Maguindanaon. Some Iranon and Manobo tribes are found in the north of Pigcawayan. This is followed in rank by migrants Cebuano, Tagalogs and Hiligaynons. The rest is a mixture of Chavacanos, Ilocanos, Chinese, and Maranaos. Based on religion, the Catholics compose the biggest group, followed by Islam.

Income in Cotabato City is derived mostly from commercial and service establishments. Its economy is unique in the sense that the labor force is partly employed in the nearby municipalities. Although more secondary industries thrive outside its boundaries because of its limited usable land area, the city is still relied upon to provide the manpower and facilities needed to make them operational such as electricity, communication network, etc. Other facilities such as the airport in nearby Awang and the Cotabato river port help much in boosting the city's economy. As a result, the city at present has a total of 1,384 commercial and service establishment, and 116 industrial establishment. The latter are mostly agriculture-based industries.

Agriculture and service industries employ most of the city's labor force. In 1975, the economically active population was 20,955. (ef. Table 2) That censal year also reported a dependency ratio of 1 is to 1.25 among persons 10 years old and over.

Like most cities in the south, Cotabato could still boast of its agricultural products. A well-known delicacy called "Pigek" a specie of fish spawns at the Tamontaka and Rio Grande rivers which bound the city at the northern and southern limits. The western coast is devoted primarily to fishpond culture. This is the source of "bangus" and crabs which are exported to other parts of the country. The rest of the area is devoted to low-land farming.

Agriculture forms the basic income source of the populace of Pigcawayan. Its geographical location provides fertile plains best suited for agricultural purposes. Upland and lowland farmlands, most irrigated benefit the farmers. Rice and corn are the two major crops raised. Rice is the most widely cultivated, giving a bulk of rice production for the region and other parts of the country. With the wide implementation of irrigation system and with the massive financial and technical assistance extended by the government to the farmers, the district yields a favorable harvest seasonally. Other endeavors like poultry yards are also vital in the area. A few number of stores selling farm implements cater to the needs of the area's farmers.

Aside from agriculture, trade, commerce, and industry employ some of the area's labor force. Some of these, but to a minimal number are Textile dealers, Appliance dealers, Hardware firms, Furniture shops, Bakeries, Logging concessions, and others. They are mostly located in the heart of the town.

In the area of health, there are 3 hospitals to service the medical needs of the city residents. The Regional Hospital is located within the city and the Cotabato City Hospital has been recently established for the indigent city residents alone. Due to the distance of sitios from the city proper, the city offers the services of a mobile clinic. A private hospital run by the Dominican sisters - Notre Dame Hospital - is located on the outskirts of the city and caters to the middle and high income class. Centers have also been established for both preventive and curative treatments - the Cotabato Chest Center, the Puericulture Center and Maternity Hospital, and the family planning clinics.

Unluckily, because Pigcawayan maybe considered a rural area, no hospital is available to meet the needs of the residents. However, two clinics, one health center and one puericulture center are present in the area. Five boticas, two doctors, one dentist, four midwives and five pharmacists are serving the residents of Pigcawayan.

"Slum area" in the city cannot be considered a decay brought about by urbanization. Most of the "slums" are found beside a river or a stream. The reason behind this is the river orientation of the

Maguindanaon. Historically, they are river dwellers so they insist on living beside the rivers or streams forming what appears to be disorderly groups of houses. This condition is worsened by the influx of evacuees who try to make do with shelter they can put together. Efforts are being made to provide order to settlements thru a number of housing projects by the catholic hierarchy and the government. The first housing project opened was the ND Village in 1967 provided by the Bishop of Cotabato. This was followed by another project of the Notre Dame Social Action Center. And, recently, the city government put up a BLISS project.

Housing has been a critical problem in the city especially with the opening of the Regional Development Complex. Branches of agencies of the National Government have opened their offices in the city in conjunction with the regionalization scheme. This has increased the number of city residents and the need for housing in the city.

In North Cotabato division under which Pigcawayan as a district belongs, 38 housing loans were approved in 1977. Said loan grants were financed by the Development Bank of the Philippines (DBP). Among the resettlement sites in Region XII, under the DAR Resettlement Program, provided with a total area of 356,575.5 hectares, North Cotabato has acquired two sites. These settlement sites are provided with facilities like school buildings, health centers, motor pool, public market and others. Under the PANAMIN Resettlement Program, North Cotabato was chosen as one of the sites of 13 resettlement projects

from which it has acquired 8 resettlement projects.

A set back to the economy of Cotabato City and Pigcawayan was the troubled peace and order situation in Mindanao. Evacuees from the troubled areas place a burden on the areas' facilities. Military operations always create an atomosphere of tension among Cotabato City and Pigcawayan populace. On the outskirts of the city itself, particularly Pigcawayan, a number of houses were abandoned and schools were closed temporarily. Attempts are being made to promote better understanding among the Moslems and Christians with leaders especially from the educational and religious sector taking an active role.

Educational Institutions

Public Schools. In school year 1979-80, there were 20 elementary schools and one high school in the public school system. The number of pupils enrolled in the elementary level was 14,292 composed evenly of Moslems and Christians. (ef. Tables 3 and 4). The only public high school in the city has 8,000 students with 153 teachers. The city is divided into 4 supervisory districts. Due to the peace and order condition in some areas, 4 schools were temporarily closed but only one remained unopened this school year.

Pigcawayan has fifteen existing public schools, two are offering kindergarten level courses, ten are offering elementary level courses, and three are offering secondary level courses.

Private Schools. There are four private schools offering elementary level courses and five private schools offering secondary level courses. There are also five privately owned vocational schools in the city. Tertiary education is handled by two institutions - the Notre Dame University and the Philippine Harvardian College. Both institutions service not only the city but the entire Cotabato group of provinces.

Pigcawayan has one private secondary school - the Notre Dame of Pigcawayan.

The Public School System: Cotabato City Division

Student Profile. The enrolment figure from school year 1971 to 1977 show negligible increases or decreases during the five year period (cf. Table 5). However, the year-end enrolment is consistently lower than the opening-year enrolment. The division registered during those years an average drop-out rate of 5.15%. The biggest number of drop-outs occurred during SY 1974-75 when the rate reached 7.54%. That year was the height of MNLF-government forces armed clashes in the area.

The participation rate for 7 year olds is approximately 90%. However, the data show that 40% of the Grade I enrolment were overaged, i.e. above the ordinary age for Grade I which is 7 years. Enrolment records for SY 1979-80 reflect lower participation rates as grade levels go up.

The survival rates for Grades I to IV average 79.13%. However, from Grade V to Grade VI the survival rate is 100%.

Teachers' Profile. The shortage of trained and academically qualified teachers is still evident in the division. Although there is an average teacher-pupil ratio of 1:38, the geographical distribution of schools as well as unstable peace and order conditions create conditions of either very low or very high teacher-pupil ratio.

Facilities. In SY 1977-78, the four city districts had a total of only 247 classrooms out of the 272 needed in order to service the number of pupils enrolled in the division. Although by SY 1979-80, the number of classrooms increased to 318, this increase barely kept pace with the increase in enrolment thus the division remains facing the problem of classroom shortage.

In order to meet the above problem, the division had adopted several strategems. Among them are (1) multi-grade classrooms; (2) double shift, i.e. one class holds session in the morning only while another class holds its session in the afternoon only using the same room.

Besides classrooms, the division also lacks the standard industrial and agricultural arts shops. Sports, music and art facilities are also lacking if not altogether non-existent.

The North Cotabato Division

Student Profile. Based on the estimated school - going age population for SY 1977-78, North Cotabato to which Pigcawayan district belongs recorded 104.9% enrolment participation rate, 2.9% higher than that of 1975. For the secondary level, North Cotabato is one of the two provinces with the highest enrolment participation rate, 57.9%. This high percentage of enrolment recorded in North Cotabato and the other province among the five provinces of Region XII could be attributed to the presence of more schools and high population concentration in the said two areas.

Teachers' Profile. Among the nine school divisions of Region XII as of SY 1977-78, North Cotabato has the most number of elementary and secondary levels teachers, a total of 3,285. An average teacher-pupils ratio 1:31, higher than the standard of one teacher for every forty pupils is maintained for both elementary and secondary levels in North Cotabato division.

Facilities. As of the SY 1977-78, North Cotabato has the most number of elementary and secondary schools, 408 and 79 respectively. Of the 408,396 are public and 12 are of the private category. Of the 7,955 are public and 24 are privately owned schools. Figures rank highests as compared to the eight school divisions of Region XII.

In the same school year, North Cotabato division has maintained an adequate number of classroom facilities, 2,641 for the school year's total enrolment of 103,198 both in the elementary and secondary levels. Classroom-pupils ratio is slightly higher than the standard ratio of one classroom for every forty pupils both in elementary and secondary levels. This favorable classroom-ratio is attributable to the presence of more schools in this division.

Percent Breakdown of Pupils According to Education of Parents

Educational Level	Urban		Rural	
	Father's Ed.	Mother's Ed.	Father's Ed.	Mother's Ed.
Doctorate/Masters	1.4	.7		.3
College Graduate	25.1	20.0	5.3	5.3
Undergraduate	34.4	28.0	10.7	10.7
H.S. Graduate	51.4	41.0	24.4	24.0
Elementary Graduate	67.7	61.0	65.3	71.6
Primary Graduate	72.7	67.3	80.9	86.0
Grade I	76.4	70.6	88.9	92.3
No formal schooling	6.0	15.0	1.3	.3
Don't know	17.6	14.3	8.7	7.3

Percent Breakdown of Pupils According to Parents' Occupation

Type of Occupation	Urban		Rural	
	Father's	Mother's	Father's	Mother's
Housekeeper	1.0	50.0	.7	72.0
Storekeeper	5.7	12.7	1.0	3.0
Carpenter	7.7	-	6.3	-
Farmer/Fishermen	8.0	1.3	65.0	10.0
Driver	22.3	-	8.7	-
Tailor/Dressmaker	2.3	5.3	-	2.7
Clerk	14.3	9.7	1.7	1.0
Teacher/Other Professions	5.6	10.0	1.0	3.7
Military	5.3	.3	4.7	-
Others	20.5	6.4	7.2	3.3
No answer	7.3	4.3	3.7	4.3

% Grouping of Pupils According to Ownership of Goods
(100% per category)

	Urban	Rural
Radio	86.0	74.7
Newspapers	78.7	24.7
Magazines	51.7	18.7
Gas/Electric Stove	47.3	20.3
Television	41.7	8.0
Refrigerator	34.0	8.3
Stereo	30.7	19.0
Car	13.0	3.7
Motorcycle	12.7	8.7

Weights: 3 = very adequate
2 = barely adequate
1 = inadequate

Resource Materials	Urban	Rural
Library	2.3	1.7
Periodicals	2.3	1.6
Gen. Reference	1.9	1.7
Average	2.2	1.7

Instructional Resources for Teachers

	Urban	Rural
Course of Study	2.3	2.7
Teachers Guide & Manual	2.9	2.7
Resource Units	2.5	2.5
List of Obj./Learning Task	2.4	2.1
Bulletin Memo Circular	2.7	2.0
Average	2.6	2.4

Instructional Resource for Pupils

	Urban	Rural
Supplementary books	2.51	2.1
Workbook/exercise book	2.0	2.0
School Magazines	2.0	1.7
Average	2.2	1.9

Teaching Aids

	Urban	Rural
Av Materials	2.4	2.2
Laboratory	1.8	1.4
Classroom	2.3	2.8
Average	2.2	2.1

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