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INNOVATION AND TECHNOLOGY

PROJECT IMPACT FOR MASS PRIMARY EDUCATION

PROGRESS REPORT No 1

Innotech

August, 1974

INNOTECH/IMP-PR-7/74

PROJECT IMPACT

FOR MASS PRIMARY EDUCATION

Progress Report No.1

Concessa Milan-Baduel

Boorham Raspati

SEAMEO Regional Center
for
Educational Innovation and Technology

Saigon

August 1974

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FOREWARD

This document represents the first complete report of the IMPACT system which this Center hopes can provide a means to achieve this Region's vital need to provide at least a primary education for all our children. It also represents the first report of the progress of IMPACT in its two field sites in Indonesia and the Philippines. It is my firm belief that the creative dedication shown by project staffs will allow this Center to report continued progress for a number of years.

IMPACT represents only one approach being undertaken in this Region in an attempt to provide for mass primary education. This Center also is in the early experimental stages of another project which we feel has the potential for providing some of the answers we so desparately need. The project is titled "Reduced Instructional Time" (RIT) and is an effort both to make in-school learning more effective and efficient and to reduce the amount of time that a teacher must spend in "imparting education" to children. The means for achieving these hoped for joint goals is the redesign of instructional materials and procedures so that children can be provided with learning experiences which are both effective and exciting and so that teachers may be freed to some degree from their traditional roles of being full-time classroom lecturers. The time saved would allow a rescheduling of schools so that more children can have access to present facilities and teachers.

A third project with which this Center is cooperating is called the "In-School Off-School Approach" (ISOSA). It is an undertaking of the Philippine Government under the direction of Dr. Liceria Brillantes-Soriano, Director of Public Schools. An

attempt is being made to double the number of children learning under a given teacher by having one-half of the students "off-school" (perhaps for one week at a time) while the other half are "in-school." Off-school learning will be very much like that of IMPACT in the use of "non-teacher" types of learning, i.e., self-instruction, community resource persons, peer and older student tutoring, etc.

The future picture of primary education in Southeast Asia clearly will be quite different from that which we have seen traditionally. What that picture will be cannot be forseen clearly at this time, but the three approaches of RIT, ISOSA and IMPACT undoubtedly will exert a strong influence, and we are confident that what we will be learning in the next several years will have an impact in many other parts of the world.

Pham Van Cung
Director

ACKNOWLEDGEMENTS

We want to express our most sincere appreciation to the following persons and institutions. Their foresight and continued support has enabled the IMPACT field staffs to make the progress reported herein.

Philippines : Dr. Narciso Albarracin, Undersecretary, Department of Education and Culture.
Dr. Liceria Brillantes Soriano, Director of Public Schools.
Dr. Bonifacio Sibayan, President, Philippine Normal College.
Dr. Aurelio Tiro, Regional Education Director of the Central Visayas.

These persons have provided strong guidance and support both as individuals and as members of the Philippine National Steering Committee. Dr. Tiro deserves an especial note of gratitude because of his daily support and encouragement of the field work taking place under his supervision.

Indonesia : Dr. Santosa Hamijoyo, Chairman, Office of Educational Development (BPP).
Drs.Yusufhadi Miarso, Director,

Drs.Sumitro, Director, Institute for Educational Experiments (BPP)
Drs.Parmanto, Acting Rector, IKIP Surakarta

Project IMPACT has been undertaken as a joint project of the Office of Educational Development (BPP) and INNOTECH. The support of the BPP has been essential to our progress. IKIP Surakarta (Surakarta Teachers Training College) has provided the total professional staff in Indonesia from among senior members of its faculty.

The research staff and Director of INNOTECH have guided and backstopped our field efforts throughout this initial period. We have leaned heavily on their expertise, particularly in the development of our own expertise among the field staffs.

Finally, we are deeply indebted to the International Development Research Centre of Canada, and particularly to Mr. Donald Simpson, for the faith shown both in the potential of Project IMPACT and in the ability of the Regional INNOTECH Center to carry out this important work.

Concessa Milan-Baduel
Boorham Raspati

BACKGROUND AND INTRODUCTION

Approximately one-half of the children in Southeast Asia are unable to complete a primary education. Expansion of traditional methods of schooling (more classrooms, teachers, textbooks, etc.) to cope with this problem is not possible. To do so would require a proportionate expansion in educational budgets in countries whose budgets already are strained simply to provide the above inadequate level of educational opportunity. If a solution is to be found, non-traditional alternatives must be sought.

In recognition of both the problem and the budgetary constraints, the Southeast Asian Ministers of Education Organization (SEAMEO) assigned to the Regional INNOTECH Center the responsibility for the "Development of an Effective and Economical Delivery System for Mass Primary Education."[1]

As a first step, INNOTECH hosted a Regional Seminar on the topic in February 1973[2]. One full day of the Seminar was given over to a brainstorming session of a Select Committee of educators from both within and without the Region. Focus of the brainstorming was upon potential means for delivering mass primary education

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1. SEAMES. SEAMEO Educational Development Programmes for The 1970's: Report of the Technical Working Group, Southeast Asian Ministers of Education Organization, Bangkok, July-August, 1972
2. Delivery of Mass Primary Education, A Regional Seminar, INNOTECH/RS-73/7, March, 1973

in Southeast Asia and upon the probable courses that INNOTECH could most profitably take in designing a research program to meet this priority need.

The INNOTECH research staff and consultants, working from the recommendations of the Select Committee, produced an initial Research Planning Document in April 1973[3]. This document outlined a community learning center system that contained the essential components of what has become Project IMPACT. (The Appendix presents selected excerpts from the Planning Document, including (1) Justification for using a single delivery system concept for initial research planning, (2) Justification for adopting the community learning center concept, (3) Limitations on the scope of initial research, and (4) Procedure for Research Planning.)

The Planning Document was resubmitted to members of the February Seminar's Select Committee for review. It subsequently was revised as a Technical Proposal[4] for submission by the SEAMEO Secretariat (SEAMES) for securing external funds in support of the project.

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3. INNOTECH, Research Planning Document: Setting Priorities for INNOTECH Research on the Delivery of Mass Primary Education. Singapore, 10 April 1973.
4. SEAMES. Technical Proposal: Delivery of Mass Primary Education in Rural Southeast Asian Communities. Southeast Asian Ministers of Education Organization, 10 September 1973.

In advance of formal funding, project sites were selected in Indonesia and the Philippines, and a Project Director and Associate were recruited at each site. These four project staff members met with the research staff in Saigon for four weeks in November-December 1973. This group produced the research design[5] upon which IMPACT is currently based.

Project IMPACT was officially begun in January 1974 as a joint program of the host governments (Indonesia and Philippines) and INNOTECH with the major funding provided by the International Development Research Centre (IDRC) of Canada.

The present report is the first in a series of formal annual progress reports. Because it is the first, we are presenting in Chapter II a fairly complete description of the IMPACT delivery system and the rationale behind it. In addition, Chapter II contains short descriptions of two other projects in Southeast Asia which also are devoted to finding means for delivering mass primary education. One is the In-School Off-School project of the Philippine government and the other is Project RIT (Reduced Instructional Time) conducted by INNOTECH in Vietnam.

Chapter III reports the progress of IMPACT over its first six months of development and the plans for succeeding years. Separate reports of progress and plans are made for the project sites in the Philippines and Indonesia.

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5. Ouy Vanthon, Concessa M. Baduel, Boorham Raspati, Rosetta F. Mante and Saleh Mantasir. Project IMPACT: Initial Planning Document. INNOTECH, Saigon, 14 December 1973.

A DESCRIPTION OF PROJECT IMPACT

The word IMPACT is an acronym for Instructional Management by Parents, Community and Teachers*. The title provides a fairly accurate description of the IMPACT system. "Management" is a key word because the professional teacher's role is drastically changed from one of being a classroom instructor to one of being a manager of learning experiences which are gained primarily through non-teacher sources (community volunteers including older students as tutors and adults with special skills, self-instructional learning modules, remedial classes conducted by older students, self-directed group interaction, possibly instructional radio, peer "buddy system" learning, monitoring of progress by parents, etc.).

IMPACT, in many ways, goes back in time before we had formal schools (and before parents delegated the responsibility for their children's education to professional teachers) when the responsibility for the transmission of knowledge and skills rested with the family and community. The IMPACT system once again insists that the basic responsibility for education resides in the community. What it does provide, however, is for relevant and quality learning experiences which are organized and managed professionally to provide for effective learning.

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* In Indonesia, the acronym is Proyek PAMONG: Pendidikan Anak oleh Masjarakat, Orang tua dan Guru which is translated as Primary Education by Community, Parents and Teachers.

Since the inception of the IMPACT concept, the staff has been questioned numerous times as to whether the system represents formal or non-formal education. We consider it a marriage of the two concepts. It is primarily non-formal in the sense that there is little formal classroom teaching and that it is designed to make optimum utilization of community resources of all kinds. However, it is also formal in that it provides for systematic management of the learning process.

The staff prefers that the reader judge the above distinctions for himself from the following description of IMPACT which first appeared as a "newspaper clipping" in the April 1973 Planning Document[3]. Note, first, that the clipping is dated January 1980. Note also that the article gives a fairly fanciful description of a primary education system that undoubtedly will never come about in exactly the way it is described in the clipping. IMPACT is a concept involving the management of learning experiences; as we gain experience at the project sites with the various components of the system, however, there will be undoubted revisions which will change whatever is actually reported in a newspaper in January 1980.

Newspaper Clipping

Sealand, January 1980

Primary schools throughout Sealand are closing School bells no longer ring. On visits to three isolated villages during the past week this reporter did not see one class in session.

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3. ibid

In response to my questions about the cause of this calamity, I received tolerant smiles from villagers and was told time and again that "our concern is not with schools, it is with the education of our children."

What has happened in Sealand and in other countries in Southeast Asia is a revolution in education. Seven years ago, budgets of these countries were strained simply to provide education for one-half of primary age children; today, even in remote villages, essentially all children are receiving primary education. The concept that has brought about this revolution is the one voiced in my recent visits to Sealand villages - "our concern is not with schools, it is with the education of our children." A totally new system of primary education has been based upon this concept, and it represents a dramatic departure from the familiar and traditional primary school classes of my own youth.

How did this new system come about? It started with the Southeast Asian Ministers of Education Organization (SEAMEO), a cooperative effort on the part of eight countries in Southeast Asia to pool their resources in an attempt to solve pressing educational problems common among the countries of the region. The organization, in planning for the future, documented its planning under the title of "Educational Development Programmes for the 1970's", and a high priority

was assigned to the development of an effective and economical delivery system for mass primary education. The 1970's have passed, and the IMPACT education system which I recently saw in Sealand villages is the outcome of SEAMEO's far-sighted planning for the 1970's.

MOA LIA GOES TO "NO SCHOOL"

Moa Lia is the 10-year old son of a farmer in a small Sealand village. In questioning him, his parents, the district education inspector and others in the village I was able to piece together the following picture of the educational revolution through the eyes of those who are taking part.

Q: Moa Lia, what grade are you in?
Moa Lia: I don't know.
Father: We don't have grades or classes any more. Moa Lia, tell him what modules you have completed.
Moa Lia: In Language I have completed module 23, in Science module 17, in Mathematics 15, in Social Studies 12, and in Applied Projects 28.
Q: I don't quite understand. What is a module?
Moa Lia: It is a learning unit that usually takes me about a week to finish.
Q: Is it a chapter in a textbook?
Moa Lia: No, I don't have any textbooks. A module can be lots of things. Most

times it is a self-instructional booklet of about twenty pages that I can do by myself. Of course, I do have to ask somebody to help me sometimes. Other times a module might ask me to work with a shopkeeper, or a carpenter or even the village headman. Once a bunch of us helped the district health officer on a project to drain water from some areas to get rid of mosquitos.

Q: Why don't you use textbooks?

District Inspector: We found that it would be a lot cheaper to have modules because we don't need so many. For example, once Moa Lia finishes a module he turns it in and somebody else can use it. Having a textbook is like carrying around twenty or thirty modules, even though a child can only read in one chapter at a time. Moa Lia, let him see your Science module 18.

(Science Module 18, as I examined it, most certainly was not a textbook. In the first place, the pages were fairly thick -- probably some kind of plastic. I was told that much money was saved because the plastic pages allowed the module to be reused

many times without deterioration. It could even be cleaned up after being dropped in a puddle of water -- boys will be boys in any country. The content of the module was in the language of Sealand and I couldn't read it, but it clearly was a lesson on the human heart, and it included a number of three-color pictures. There wasn't much of the usual textbook about it. Obviously, it was some form of programmed instruction with places for Moa Lia to answer and to check his own answers. Pretty sophisticated stuff for a ten-year old.)

Q: Moa Lia, isn't a module like this difficult for you to do?

Moa Lia: I have to work hard, but I know what to do and I can ask for help if I need to. I had to learn to read first and then I had to "learn how to learn", that is, I had to learn how to use each module.

Father: I never went to school, but I know what Moa Lia should be doing at any time. Even though I don't always know what it is he is learning, I know the steps he is supposed to follow. All the parents in this village, thus, can help their children on how to learn. We also can keep track of what they are doing and, because they are our own children, we are responsible for their progress. Moa Lia also is responsible because we both know that both he and our country will benefit from his learning.

Q: Moa Lia, you said that you have "learned how to learn." What do you mean?

Moa Lia: Everytime I pick up a new module, I listen to a cassette tape while previewing the module. I can listen to it as many times as I want until I am sure of what to do.

Q: Aren't cassette tapes expensive?

District Inspector: There are two inexpensive cassette players in the village and each module has only one cassette. The two cassettes are necessary in case one breaks down and has to be repaired. They are a lot cheaper than a teacher.

Q: Moa Lia, you also said that you had to learn to read first. How did you do that? You couldn't have learned from a module like this one on the human heart.

Moa Lia: Even before learning to read, I had to learn to speak.

Q: I don't quite understand.

Moa Lia: Most of the kids here grow up speaking a local dialect. We only know a few words of the national language when we start primary education.

Q: How did you learn to speak?

Moa Lia: When I was about six years old, I started listening to some radio programmes which taught kids how to understand the national language.

Father: We have four or five transistor radios in the village. Much of the time they are used by younger children in language learning but there are also adult programmes which we listen to. I have made several changes on the farm after listening to agriculture programmes.

Q: Moa Lia, so you learned to speak only by listening to the radio?

Moa Lia: No, but the radio helped me get started. Some 8 to 10 of us had a class in the main house of the village where we listened to special cassette tapes. Some of the kids parents who spoke the national language also helped us out.

Q: Did you have a teacher?

Moa Lia: Not really. The same parents helped out; some of the older kids also helped us.

Q: Then you learned to read?

Moa Lia: Yes, but we had to pass a listening test first to make sure that we knew enough to learn to read.

Q: Who gave the test?

Moa Lia: The Instructional Supervisor was here one day and gave it. Sometimes parents or older kids give it.

District Inspector: The Instructional Supervisor (IS) is the professional who manages the whole primary system here. The IS for this village also is

responsible for two other villages in the district and makes regular rounds of the villages.

Q: I would like to find out more about the IS. But first, Moa Lia what happens if you don't pass the listening test?

Moa Lia: They find out what we do and don't know, and parents and older kids coach us.

Q: How long did it take you to learn to speak and understand the national language?

Moa Lia: About four months; it was fairly easy. Some kids take one or two years because they weren't able to learn it full time; they had to help their fathers.

Q: O.K., once you learned to speak, how did you learn to read?

Moa Lia: By programmed teaching and by modules which I could take home.

Q: What is programmed teaching? Is it a special method that your teacher uses?

Moa Lia: The person who taught us wasn't really a teacher; it was a parent who had graduated from primary school and could read.

Q: Not a teacher?

District Inspector: Moa Lia is right. The people who act as teachers here are not graduates of a TTC, and they only have a primary education. In this village, for example, three members of the community have volun-

teered to work part-time in the programmed teaching programme for reading. They are paid by the hour at a rate of about one-third of what it would cost for a teacher who had graduated from the TTC. We give them two weeks of specialized training in very specific techniques for teaching reading. Two older children who are in approximately their last year of primary education also have become programmed teachers All older children are required to spend time in helping younger ones learn different subjects, quite often by individual tutoring. This scheme has been very successful. Not only do the younger children learn quite effectively, but the older students also report that they themselves have learned a lot by teaching others. Because these villages have very little money, the free time given by older students in the teaching of the younger ones represents real savings. Before we had the new system. any teaching had to be done by a qualified teacher who was paid a regular salary, and there was no way that this village could afford to pay a full-time teacher. In several places in my district military servicemen fulfill some of

the teaching aide functions.

Q: During all the time that we have been talking today, I have yet to find out what the school teachers do.

Moa Lia: We don't have any -- just some of the parents and older kids.

District Inspector: Moa Lia is right. Under the new system we don't have teachers and classes and textbooks in the same way that we used to. We simply cannot afford it.

Q: But I have seen some fairly sophisticated instructional materials -- learning modules, transistor radios and cassette recorders. How can you afford these things?

District Inspector: For the simple reason that we do not have teachers. Traditionally, more than 80 per cent of education costs have been teacher costs -- salaries, retirement, training, etc. The most revolutionary change made by the Project IMPACT was to eliminate the use of professional teachers who were tied to the classroom and to retrain them to become Instructional Supervisors. The usual student-teacher ratio in the past was 35:1. Our present student -- Instructional Supervisor ratio is 200:1. The IS's make a much better salary than they did as teachers, but we still have realized at least a four-fold savings

in teacher costs. The money we have saved in this way is used for instructional materials of various kinds and to pay modest stipends to local instructional aides (community members with special skills).

One other benefit of this new scheme has been our ability to retain good IS's in the rural communities. We had a very difficult time in the past in attracting and keeping good teachers in the villages. The increased responsibility, prestige and income of IS's seems to have played a big part in making rural education more attractive to top people.

Q: I now have a fairly clear idea of the kinds of learning experiences which children such as Moa Lia have under the new system. I also understand to some extent how the community draws upon its own resources to assist in primary education. But, I am not clear exactly what part the Instructional Supervisor plays in all this.

District Inspector: Throughout my district, each IS has the responsibility for about 200 primary children. In some of the larger towns there are two or three IS's. For small villages such as this one, however, there is only one -- and he is responsible for two

In larger towns, an IS will have an office in a permanent learning centre. Here, however, the learning centre is mobile. The IS travels in a small van which is his mobile learning centre.

The learning centre is the hub of the primary education system. It contains the appropriate learning modules, the cassette instructions for each module, tests for each module, instructional materials for use by programmed teachers and by other kinds of teaching aides, and progress records of each student.

Q: Moa Lia earlier mentioned that he had to take a test on understanding the national language when it is spoken before he could begin to learn to read. Does each module have such a test?

District Inspector: Yes, each module has several kinds of tests. First, when a child selects a new module he takes a readiness test to insure that he has all the necessary prerequisites to benefit from the module. The results of a readiness test may, at times, indicate that a child needs to take another module first -- or it may indicate that he should complete a

review module, especially if he hasn't been able to take any modules for a long time because of illness or work on the farm.

Most modules of the self-instructional types also have quite a bit of built-in self evaluation to help a child monitor his own progress and be ready for the post-test when he finishes the module. Successful completion of the post-test itself indicates that a student has achieved the objective of the module and his achievement is entered on his record, one copy of which is kept by the Instructional Supervisor and the other copy is kept by the student so that he can keep track of his own progress.

The system is very flexible since it allows a student to take a post-test even if he hasn't studied the module -- if he feels confident that he can achieve the objectives of the module.

Q: What about adults, can they take the post-tests?

District Inspector: Of course, anyone in this village can take any of the modules or any of the tests. Primary education is no respecter of age. We used to worry about the dropout and wastage problems a lot more than we do now,

and one reason for that worry was that if a child didn't finish primary school by the time he was about 14 years old we felt that the education system had failed. We even designed non-formal systems to upgrade the competencies of "over age" persons -- and non-formal education was kept fairly separate from primary school. What SEAMEO has done in Project IMPACT is to incorporate much of what was called either "non-formal" or "community" education into a single system of achieving the educational objectives of primary education.

A person can progress through primary education at his own pace. A number of children now start school at a later age. (We have found students who begin at an older age actually progress faster -- providing some additional savings in our educational resources.) Many students are working, usually on their parents' farms. At certain periods during the year they do not have time to keep up their studies. However, they usually don't drop out as they used to when they would have been forced to repeat a grade on returning to school. Now they can come back and pick up where they left off, perhaps starting out

with a review module to cover previous work.

Q: What form are the tests in?

District Inspector: There are all kinds, depending on the objectives of the module. Sometimes there are performance tests on some practical skill, quite often there are knowledge questions, but the most usual form concerns the application of what has been learned.

Q: Does the Instructional Supervisor give all these tests?

District Inspector: It is not possible. On the average some 100 students complete a module each week, perhaps 30 in each village. It takes about 15 hours each week in each village for testing alone. Volunteer aides give the tests. They have been trained by the supervisor to do so.

Q: Isn't there a chance for aides to score a child a little more favorably than he really deserves because of village pride?

District Inspector: We suspect that, when we first started and people didn't fully understand the system, some favoritism was shown. But, villagers soon learned that the tests were for a student's own good -- to show his strengths and weaknesses as a basis for improvement. Since most persons now finish primary education there is no particular need

for any examinations other than the tests associated with the modules. After all, the amount of education a child receives is up to himself and his family -- and they have come to realize that what they are learning is relevant to their lives as community members and as productive members of society.

Children who desire to go on to higher levels of education must pass readiness tests before going on. These examinations are conducted periodically by the central government.

Q: We have been talking all afternoon about modules, but I have no idea how many modules constitute primary education.

District Inspector: The number varies in each subject, but the average number is about fifty.

Q: Getting back to the Instructional Supervisor -- it appears that he is more a manager than a teacher.

District Inspector: That's very close to the truth. Let me list some of the duties of the IS:

... Select and train teaching aides from the community in specific duties,

... assign tutorial responsibilities to older students and train them in these functions,

... conduct PTA meetings to orient and train parents for the self-management of their children's studies,

... survey community resources and enlist persons with specific skills to assist students to "learn by doing" for some of the applied modules,

... monitor all instructional and evaluation activities,

... maintain student records of progress, giving particular attention to those who are progressing unusually slowly as a basis for counseling with students and parents,

... maintain a complete inventory of the learning centre, including instructional modules, equipment and tests, repairing or replacing as needed,

... provide feedback to the central government on the assets and liabilities of given instructional modules as a basis for improvement,

... serve as an advisor to the communities on educational matters.

Q: I'm still confused. It was a lot more understandable when there was the school, the teacher and textbooks. It seems that everybody in the village is somehow involved with the new system.

Father: That's about right. Students are helping

students, parents are helping their children and specialists in the community as acting as part time aides. We couldn't do this on our own, though. We need the structure that is provided by the learning modules, and we need the organization, management and counsel of the Instructional Supervisor.

Q: I can guess your answer to this last question: How is the system working?

Father: If you mean if there are problems, the answer is yes. There is often some kind of mixup, but it is getting sorted out fairly well.

If you mean if children are getting a primary education, the answer is a definite yes. No matter how fast they are progressing, there has yet to be a student in this village who has given up and stopped.

If you mean if children are in school, the answer is no. This is a Project IMPACT village. OUR CONCERN IS NOT WITH SCHOOLS, IT IS WITH THE EDUCATION OF OUR CHILDREN!

The above "newspaper clipping" appeared in the May 1973 issue of the INNOTECH Newsletter. A few readers at that time got the impression either (1) that the IMPACT system already was operable or (2) that INNOTECH was going to develop a system exactly as described. Neither impression was correct; the project is only in an early research stage

and the staff expects that it will need to make many changes to the IMPACT system as it gains experience and experimental data. The key concept of the management of a variety of learning experiences by a trained professional (the Instructional Supervisor) is what is being developed and tested. The various components and methods of learning may be altered without changing the management concept of the IMPACT system.

To some, Project IMPACT may seem revolutionary because the traditional classroom is replaced by a community learning center which provides educational experiences outside the classroom*. However, if the reader will examine the various components of the system, he will find that all have been used in a variety of educational settings in the past. Self-instruction, older student tutoring, ungraded self-pacing, community volunteers, programmed teaching by older students, parental guidance, radio, cassettes, etc... no single component has not been tried successfully at one time or other. What is revolutionary (new) is the IMPACT system of managing these various learning components, and it is this concept that is being tested experimentally at the field sites.

What is The Rationale behind Project IMPACT?

Following the February 1973 Seminar on the delivery of mass

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* Grades I and II probably will receive much more classroom instruction than the later grades until children learn basic reading skills and are able to undertake self-directed instruction.

primary education[2], the INNOTECH research staff developed the following rationale which became the basis for the design of Project IMPACT.

... approximately one-half of children in Southeast Asia do not complete 4-5 years of primary education,

... this condition is most prevalent in rural communities in which some 70% of the population lives,

... educational budgets are already strained, and the direction of INNOTECH research should not concern ways to increase funding,

... traditional means of education (teachers, classrooms, etc.) cannot simply be expanded because funds are not available,

... non-traditional alternatives must be found which are both effective and economical,

... mass media is expensive (TV) and limited (radio) as a means for delivery of rural primary education,

... 80 to 90% of educational costs are those associated with teachers,

... ways must be found to increase the student-teacher ratios (perhaps to as much as 200:1),

... with increased student-teacher ratios, classroom teaching is unlikely, and the role of the teacher may change to one of managing educational experiences,

... inexpensive community resources of all kinds (parents, skilled workers, older students, materials, buildings, etc.) should be utilized,

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2. ibid

... students/parents may have to be responsible (self-directed) in taking advantage of educational orportunities,

... most learning may have to be self-instructional (or at least "non-teacher") under the management of the teacher, but under the direction and tutoring of parents, community members and older children,

... a means should be provided for individual learning rates and exit and reentry into the educational system at any time (as one means to avoid dropouts and wastage).

INNOTECH designed the IMPACT system in an attempt to meet the specific needs and constraints represented in the above rationale. Undoubtedly other systems may satisfy the rationale, but we felt justified in designing a single (but flexible) system* in order to provide a framework for project development and tryout. The characteristics of the initial IMPACT framework are listed below.

1. An Instructional Supervisor represents the only institutionally trained professional educator. The traditional teacher's role is eliminated, and the Instructional Supervisor acts as a manager of instruction providing the needed direction and organization in the use of a variety of learning resources. One Instructional Supervisor manages the instruction of as many as 200 primary students.

2. Community members with particular skills (carpentry, homemaking, agriculture, health, religion, etc.) are enlisted to provide specialized instruction. They are unpaid

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* See "Justification for Using a Single Delivery System Concept for Initial Research Planning" in Appendix.

volunteers who have been recruited by the Instructional Supervisor on the basis of a survey of community resources in relation to educational needs.

3. Other community volunteers and older students, who are primary school graduates, are trained by the Instructional Supervisor to conduct specific courses, i.e. beginning reading on a part-time basis. Their training is very specific to the course they teach, and they probably function as programmed teachers. Some assist in the operation of the community learning center, including record keeping and evaluating student progress.

4. Older students are expected to assist younger students through tutorials and remedial instruction. They are unpaid.

5. Parents are trained to monitor the instructional activities of their own children and are expected to take responsibility for their children's progress. Students and parents jointly are self-directed in terms of student progress, age of beginning formal education and age of completion.

6. There are no particular age limits. Except for learning reading skills, students need not be encouraged to begin at an early age.

7. Education is modular, each learning module covering the amount of instruction that normally takes one to two weeks. Each module is designed for the learning of specific educational objectives and contains both a readiness test and a post-test.

8. Many modules are in the form of individualized instructional packages. Students typically seek tutorial help from assigned older students whenever they experience difficulty.

9. Some learning modules are in the form of small group instruction under the direction of teacher's aides from the community. Others are tied to instructional radio programmes, small group exercises, etc.

10. Printed modular materials are reusable by other students as soon as they are completed by those who progress more rapidly.

11. There are very few set class periods. Students are able to drop out and reenter at any time.

12. Primary education is ungraded; progress is indicated by learning modules satisfactorily completed rather than by school levels (grades).

13. All materials and records are maintained in the community learning center.

A developmental program to try out the above concepts cannot be implemented at the start as a complete system; there is too much to learn, too many errors and revisions to be made on the way to developing a complete system for primary education. The project, thus, has been phased incrementally, beginning with the simplest introduction of IMPACT components and progressing by small steps into the implementation of a complete system. Only approximate schedules are possible because the staff must be satisfied that each phase is working satisfactorily before progressing to the next step. For example:

Initially, only the fourth grade* is taking part in the

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* Note that although IMPACT will be ungraded, grade references are used here to indicate present curriculum levels.

experiment. This is the grade at which the language of instruction is not the local dialect. At Solo in Indonesia, Bahasa Indonesia is used as the language of instruction rather than Javanese. In Naga, Philippines, English is first used rather than Cebuano.

At the start there will be no learning center, as such, IMPACT learning will take place in the classroom during normal school hours. Present teachers, who have assisted in the development of instructional materials and procedures, play a triple role: They act as Instructional Supervisors in managing children's learning; they act as parents in monitoring each child's learning activities and they act as tutors in evaluating progress and giving remedial help. (The teacher is also expected to step in at any time to give additional instruction should they feel that the IMPACT materials and procedures are faulty. At this stage, we cannot sacrifice a child's learning for the sake of some rigid experimental design. Feedback from teachers, tutors and students... including results on comprehensive examinations... will assist in the revision of IMPACT materials and procedures.)

At the start, only two subjects are to be learned in a given school. One of the subjects always is the language of instruction so that reading skills can be upgraded more rapidly. The other subject can be social studies, mathematics, language (other than the language of instruction), science or applied skills (agriculture, homemaking, etc.)

In the school at the beginning, therefore, the fourth grade teacher uses only two class periods for IMPACT instruction, and the normal class schedules are followed. Project staff will be at the schools at least one-half time

during this first critical phase of one or two months. There will be no change in a child's school attendance at this time; the only change being the kinds of learning experiences he has during his normal class periods.

Only after teachers and project staff are satisfied (that children are able to learn by way of the IMPACT modular instruction and that teachers are "comfortable" with their roles) will a second phase of assigned homework be given. This phase is the start of non-classroom instruction. Children will be given "homework assignments" of instructional modules, and parents will be instructed in the best ways to monitor their own children's learning. (Even illiterate parents can monitor the process, i.e., what the child is supposed to be doing, even if they are unfamiliar with the content.) We would expect that such homework assignments can be given after the first month or so.

Even at the start, student progress in his two subjects will be self-paced; some children will progress more rapidly than others. Progress will be charted at the school and reports of progress (completion of a module) will be made to parents.

Once the out-of-school (homework) process is going well, older students will be trained as tutors, taking over this role from the teacher. The primary responsibility of tutors will be to administer modular post-tests and to help in the remediation of any learning deficiencies.

After approximately six months, all fourth-grade subjects will be included in all villages. At this point one complete age group will be learning totally under the IMPACT system.

At the same time, methods will have been developed to make optimum use of community resource persons, i.e., volunteers who can either assist at the community learning center or can impart special knowledge and skills to students.

After one year all subjects will be included in the fourth through the sixth grades. When this stage is reached a number of present teachers will be reassigned to other schools, increasing the student-teacher ratios* to approximately 100:1.

In approximately two years, all primary learning would be included in the IMPACT system.

The above phasing of the project allows the gradual development and implementation of IMPACT which is necessary (1) to insure that every step is functioning well before attempting new activities and (2) to permit needed modifications of the original concept to be made as the system is being built.

INNOTECH is confident that the dedication of both the Philippine and Indonesian staff members will ultimately provide a viable system for the delivery of mass primary education. This dedication is clearly evidenced by the amount of progress that has been made over the past six months, as reported in the chapter to follow.

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* More appropriately: student-Instructional Supervisor ratios.

PROGRESS AND PLANS

PRELIMINARY PLANNING & IMPLEMENTATION

In August 1973, at the INNOTECH Governing Board Meeting in Saigon, Project IMPACT was first formally presented for consideration. The Center at that time was invited by the Philippines and Indonesia to visit the two countries and to seek ways in which the project could be implemented. The subsequent visits were extremely gratifying and resulted in:

(1) Establishment of National Steering Committees
(2) Selection of Field Sites
(3) Location of Project Offices
(4) Recruitment of Project Directors and Associates
(5) Scheduling of a Formal Planning Conference

1. National Steering Committees

In Indonesia the Committee is composed of:

a. The Chairman of the BPP (Educational Development Office) Department of Education and Culture

b. The Governor of Central Java

c. The Rector of IKIP (Teachers' Training College) Surakarta

In the Philippines, the Committee is:

Dr. Narciso Albarracin, Undersecretary of the Department of Education and Culture, Chairman

Dr. Liceria Brillantes Soriano, Director of Public Schools

Dr. Bonifacio Sibayan, President of the Philippine Normal College

Dr. Aurelio Tiro, Regional Education Director of the Central Visayas.

Functions of the National Committees are:

(1) Determine policies for implementation of Project IMPACT, a twin field study conducted in the Philippines and Indonesia.

(2) Define duties and functions of all educational agencies, school officials, department and bureau personnel who are involved in the project.

(3) Assist the Project Staff in the full implementation of a continuing acceptance strategy designed not only to reduce resistance but also to maintain a positive attitude and cooperative support from among the elements of the community involved in the project.

(4) Provide adequate administrative resources for the success of the project.

2. Field Sites

It was determined in early planning that the project would concentrate initially on primary education in rural areas where some 70 per cent of the population in this region lives and where the problems of schooling are the most extreme*. Rather than bas our conclusions on a single village at each site which, by chance, might be a typical, it was further

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* If sucess of the system seems probable in present rural sites during the next year, the project may be expanded to cope with the unique problems of urban education as well.

decided to include four or five villages in close geographical proximity, and we are using the term "village clusters" to describe each site.

In selecting village clusters, an effort was made to insure that they would be as representative as possible of conditions in the region, and the following criteria were applied.

a. Is rural and typical of country;

b. Has approximately 50 per cent (or less) of children currently receiving a primary education (or has a need to reduce educational costs);

c. Include some 5-10 villages of different sizes within fairly close geographical proximity;

d. Contains a sizable proportion of children who do not speak the language of instruction (which typically is used beginning in the fourth grade);

e. Has a total primary school age population in excess of 1,000.

f. Has relatively easy access to Saigon;

g. Exhibits a willingness of villages to participate in study;

h. Is close to institutions (universities or colleges) from which staff and advisors can be drawn.

The village clusters chosen have proven to be excellent in terms of pupil and school characteristics, parental concern, teacher involvement and convenience for travel and office location. They are:

1. Naga, Cebu, Philippines
   a. Naalad
   b. Pangdan

c. Lutac
d. Balirong
e. Uling

2. Solo, Central Java, Indonesia
   a. Kebak
   b. Alastuwo
   c. Banjarharjo
   d. Malanggaten

THE FIVE BARRIOS OF NAGA, CEBU, PHILIPPINES

The Philippines is a tropical country of more than seven thousand islands. One of the bigger islands is Cebu, which is located in the heart of the Visayas. Cebu City is the capital city of the province of Cebu. It is one hour away from Manila by plane. Manila is two hours away by plane from Saigon.

Cebu has five cities and forty-eight municipalities one of which is Naga. Located twenty-two miles south of Cebu City, Naga is easily accessible by car or bus. The town has evidences of urban influence, but west of the town are mountain ranges upon whose sides have thrived a cluster of villages.

Two miles from the town of Naga is the barrio of Naalad, situated in a valley surrounded by green hills. Proceeding further by road, one reaches the barrio of Pangdan, the elementary school of which is high on a hilltop which is reached by a combination of concrete ramp and almost a hundred concrete steps. Criss-crossing a winding river twice over wooden bridges one reaches the barrio of Lutac, three miles away from Pangdan and two miles away from Balirong. A baby bus, known peculiarly to the Philippines as a

jeepney enables one to reach Balirong, a barrio situated on a plateau. Three miles from Balirong is the barrio of Uling which is only a few miles from a rich copper mine being developed by a big company. The people of Uling however have remained typically rural. It may be said that the five barrios involved in Project IMPACT are typical of the barrios of rural Philippines.

Cebu is an agricultural province. Although Cebu City is definitely urban and ranks second to Manila in culture, commerce and industry, the towns of Cebu are a long way from being industrialized.

The barrios chosen for Project IMPACT are agricultural. Farming is the chief industry. For Naalad there are tobacco and corn farms along whose borders are coconut and banana trees. Corn is raised in all of the five barrios either on the plateau or on the hillsides. Coconuts and bananas abound and some families have orchards and vegetable gardens. Because of the Green Revolution campaign most households grow vegetables in the yard for home consumption. Piggery and poultry raising are engaged in by a number of familites.

In addition to farming, there are merchants, tailors and dressmakers, retailers, storekeepers, weavers, carpenters, laborers, electricians, security guards, mechanics, and plumbers whose technical skills may be availed of as community resources.

Naalad has a population of 2350 as of 1970. There are 420 families and the average monthly income is $45. Pangdan has a population of 2062 with 294 families. The average monthly income is $70. Lutac has a population of 1486 with 152 families, the average monthly income of whom is $15. The population of Balirong is 2200. There are 300 families and the average monthly income is

$75. Uling has a population of 2700 with 305 families. The average monthly income is $80.

All the barrios have assembly halls or multipurpose buildings constructed from barrio funds. These are usually located near the chapel or near the school. These one-room or two-room buildings are used for community meetings. The resourcefulness of the barrio captain is easily seen in the facilities a barrio has, like for instance a public address system. The PTA president, elected annually is usually one who is dynamic and full of initiative.

Naalad Elementary School is the nearest barrio school to the town proper. It is accessible by tricycle. As of schoolyear 1973-1974 its enrolment was 325. Of these 43 were grade three children who are now in grade four and involved in project IMPACT.

Pangdan Elementary School is combined with the Pangdan Barrio High School in the same area under the elementary school principal. The enrolment from grade one to six for schoolyear 1973-1974 was 345. Of these 40 were grade three children who are now in the fourth grade.

Lutac Elementary School overlooks the river and one gets a good view of the mountain sides where grow healthy coconut trees and fruit bearing banana trees. Its enrolment for schoolyear 1973-1974 was 228, of which 38 were grade three pupils who are now in grade four.

The most ideally situated barrio school is that of Balirong. It sits prettily on a clean plateau with the surrounding verdant hills invitingly green enough to make the visitor wish to stay

on forever. The enrolment for schoolyear 1973-1974 was 240, of which 45 were grade three pupils who are now involved in the project as fourth graders.

Uling Elementary School is situated on top of a hill accessible only on foot but rewarding enough because it affords a view of nature rarely experienced by a city-dweller. Its enrolment as of schoolyear 1973-1974 was 280, of which 46 are now in grade four.

The school buildings housing the grade four classrooms are typical one-storey low-roofed, wooden constructions which have seen better days. Naalad Elementary School has five buildings in one of which is the grade four classroom. There are the Home Economics building, the Industrial Arts building and the Allied Nutrition Project building, in addition to two buildings housing the classrooms. The grade four "classroom" is not the standard size but the teacher, Mrs. Natividad Ramireg has managed to make the room neat and clean. The desks of the children, the table of the teacher and the blackboards are several years old.

Pangdan Elementary School has a big school site on top of a hill. There are four buildings which are being constantly repaired. Mrs. Evangeline Lara of Pangdan holds her grade four class in an elevated classroom which has excellent ventilation. The equipment in the classroom is no longer new, and the furniture needs to be replaced but funds are not available.

Lutac Elementary School has managed to start a concrete fence around the four very modest buildings, one of which has no walls. The grade four classroom of Mrs. Dalisay Manugas can stand a lot of improvement.

Balirong Elementary School has made a bold attempt to make its buildings semi-concrete. It has fairly succeeded. It has four buildings including the building for the Balirong barrio high school. Miss Lolita Tesio of Balirong has what you might call comparatively speaking, the newest classroom, but still far from being standard. The desks of the children, the table of the teacher and the blackboards are no better than those of Naalad.

Uling Elementary School, situated uniquely on a high plateau has an adequate campus. It has three buildings, one of which does not look happy in spite of its green surroundings. In fact, it is the color of sadness. From out of this building came the grade three children of schoolyear 1973-1974 who are now the grade four children under Miss Myrna Repollo. With the approval of the community and the PTA officers, the grade four class in Project IMPACT is being housed in the multi-purpose building of the barrio.

All the schools have a community stage for school programs and community functions. All of the teachers have charts, flash cards and simple audio-visual devices. Under these very limited resources, the barrio officials and the school administrators and teachers have accepted the challenge of Project IMPACT.

THE SEVEN VILLAGES OF KEBAKKRAMAT, SURAKARTA, CENTRAL JAVA PROVINCE, INDONESIA

The site of INNOTECH Solo Project Pamong is in Surakarta, Central Java Province, Indonesia. Java is one of the bigger islands in Indonesia, where the capital, Jakarta, is located.

Solo is a municipality, and formerly was the capital of Surakarta residency. Solo is approximately one hour away by plane, and approximately 12 hours away by train, from Jakarta.

Surakarta, together with Yogyakarta (the former capital of Indonesia during the independence revolution) are major sites of Javanese Culture. In Solo there are the Surakarta and Mangkunegaran Palaces. Solo is located on the Bengawan Solo (Solo River) bank.

The seven village schools of Kebakkramat are located in four villages i.e. Kebak (Kebak I and Kebak II Elementary schools), Alastuwo (Alastuwo I and Alastuwo II Elementary schools), Malanggaten (Malanggaten I and Malanggaten II Elementary schools) and Banjarharjo (Banjarharjo Elementary School). These villages are approximately 15-17 km from Solo, and accessible by car or motorcycle. The distance between villages is 2-3 kilometers.

The villages chosen for Project Pamong are agricultural. The main occupation is farming, and the main crops are rice, corn and sugarcane.

There are some home industries i.e. pantile, bamboo plaiting, and there is a sugarcane factory in the vicinity.

Some local cultural and religious institutions can be used as means of education or to improve education, i.e. "gotong-royong" (Mutual assistance) spirit, the mosque puppet play.

In the villages concerned there are some organizations which could help education change, i.e. Parent Teacher Associations (P.T.A.) Boyscout Movement, Rural Youth Organization (Kader

Taruna Desa), Youth Serving Club (Sinoman), Listening Group, Institution For Rural Welfare (L.S.D.), etc.

Types of person in the villages concerned with special skills which can be mobilized for education consist of farmers, artisans carpenters, bricklayers, smiths, nurses.

There are some external educational programs, i.e. agricultural education, health and family planning education, home economics education.

The average population in these villages are 3,000 persons in each village. The average number of children in each family is 3-4 children.

Average school enrolment is 150 pupils. Average number of teacher in each school is 8 teachers, giving an average teacher-pupil ratio of 1:20.

Each school has its own school building, although one uses a temporary school building. Teaching-aids are very limited.

The ratio of post primary students to primary students in these villages is 1:7.

3. Project Offices

It was agreed that the central location of the staff offices of Project IMPACT and Proyek PAMONG during the first year should not be in the villages themselves. Instructional materials development requires access to printing services, publications, requisitions , graphic arts services and

university assistance. The field offices in both countries are in cities near the village clusters:

Cebu City in the Philippines
Surakarta (Solo) in Indonesia

The office of the INNOTECH Naga Project IMPACT is located in one of the many buildings of the Cebu Normal College in Cebu City. It is a one-storey, one-room affair, equipped with a telephone, two electric fans and nine tables for the Senior Staff, the Advisor and the subject specialists.

The Production Center is housed in another one-storey, one room building. Managed by the instructional materials officer, the Center has a mimeographing machine, two electric typewriters, one manual typewriter, two drawing boards and several tables. The facilities of the Cebu Normal College are availed of by the INNOTECH Production Center.

The office of the INNOTECH Solo Proyek PAMONG is located in 47 Dr. Muwardi Street, Solo, Indonesia. The building consists of five rooms: Two professional staff rooms, one conference room, one clerical staff room and one living room.

The clerical staff room is equipped with two typewriters and one mimeographing machine. The facilities of IKIP Surakarta are available to Proyek PAMONG whenever they are needed.

4. Recruitment of Project Directors and Associates

With the assistance of Dr. Aurelio Tiro (Regional Education Director of the Central Visayas in the Philippines), INNOTECH representatives selected Dr. Concessa Milan-Baduel as Project Director and Dr. Rosetta Mante as Associate.

In Indonesia, representatives of the B.P.P. (Office of Educational Development) and the Rector of IKIP Surakarta assisted in the selection of Drs. Bootham Raspati as Director and Drs. M. Saleh Muntasir as Associate.

5. Formal Planning Conference

The Directors and Associates from the two field sites met with INNOTECH research staff members in Saigon in November and December 1973 to develop an initial planning document and schedules. The many project phases covered in that document are given below (not necessarily sequential).

Develop planning document.

Meet with in-country authorities.

Obtain curriculum materials.

Revise curriculum with local teachers.

Secure staffing funds.

Select and hire staff.

Recruit university students (IKIP, Normal College, etc.)

Design workshop (General).

Design workshop (Specific).

Secure workshop facilities.

Select representative "Chunks" of instruction (4th grade).

"Chunk" fourth grade curriculum (including objective and suggested ways to learn).

Develop "Prerequisite vocabulary/phrase list". (from previous five months and next three months of instruction)

Develop prerequisite language testing procedures. Who tests? How to test? Student population to be tested?

Conduct prerequisite language tests (Developing lists of "use" and "remediate")

Develop orientation materials for tutors.

Recruit tutors.

Develop tutorial incentive plan.

Train tutors.

Prepare "acceptance strategy" materials and plans.

Conduct acceptance campaign.

Organize local steering committee.

Develop parent orientation materials.

Conduct orientation/training programme for parents.

Conduct workshop. (Product: Modules for first four months of instruction, including guides for instructional supervisors, tutors and parents and including vocabulary remediation).

Revise and reproduce first two months of instruction.

Revise and reproduce second two months of instruction.

Develop learning center, management plan.

Institute experimental programmes (first two months).

Institute experimental programmes (second two months).

Revise experimental programmes (first two months).

Select and recruit village teachers.

PROGRESS: JANUARY - JUNE 1974

Long term funding of IMPACT was made available in January 1974. It enabled the Center and field personnel to follow through on the implementation of plans for this six-month period and to make long-term commitments. Progress to date has included:

(1) Staff Recruitment.

(2) Teacher Recruitment and Training

(3) Organization of Local Steering Committees.

(4) Implementation of Acceptance Strategies

(5) Identifying and Overcoming Reading Deficiencies.

(6) Development of Learning Materials and Procedures.

(7) Initiation of Student Learning Activities.

1. Staff Recruitment

Through the good offices of Dr. Tiro (Philippines) and Drs. Parmanto (Indonesia) the field sites are now ably served by the following staffs.

In the Philippines, in addition to Dr. Baduel and Dr. Mante, the following professionals are devoting full-time to

Project IMPACT:

Instructional Methods Expert -- Celedonio Abayata
Instructional Materials Officer -- Maximino Alcoseba
Science Specialist -- Dr. Lily Sabulao
Mathematics Specialist -- Leandro Sanchez
Language Specialists -- Mrs. Aida Pasigna (English)
Miss Restituta Sanchez (Philipino)
Applied Skills Specialist -- Jesus Murillo
Social Studies Specialist -- Mrs. Esperanza Rodriguez
Reading Specialist -- Mrs. Elsa Villordon
Advisor -- Michael B. Nathenson

Supporting staff include: 3 typists
1 printer
2 artists
1 collator
1 driver

In Indonesia, in addition to Drs. Respati and Drs. Saleh, the professionals listed below are progressing rapidly in the development of Proyek PAMONG:

Instructional Methods Expert -- Drs. Soeharjo Danusastro
Instructional Materials Officer -- Drs. Maryono
Science Specialist -- Drs. Lithon Sunyoto
Mathematics Specialist -- Drs. Suparjo
Language Specialists -- Drs. Soethadi (Indonesian)
Soemitro S. H. (Javanese)
Applied Skills Specialist -- Drs. Danarto
Social Studies Specialist -- Drs. Soeharno Ts.
Rural Education Coordinators -- Drs. Widodo & Mr. Saleh

Instructional Methods Advisor -- Dra. Suharsini

Supporting staff include: 2 typists
1 printer
1 driver
1 messenger

Additional staff members will be recruited, as needed, within the constraints of the project budgets.

2. Teacher Recruitment and Training

Local teachers are as important a component as any in the IMPACT system. It is only through them that field staff can be assured that learning procedures and materials are appropriate to the needs and abilities of their children. In both countries teachers are devoting a full day each week working with the field staffs. Their main functions to date have been:

... coordination in the development of learning materials (in both countries the National Steering Committees decided that the curriculum was to remain unchanged from that being taught in the village schools),

... review of learning modules before they are reproduced to insure that they are compatible with the curriculum and with the abilities of village children,

... developing a knowledge of the IMPACT management system and their own roles in that system. (Weekly meetings of staff and teachers are held so that all procedures can be well defined in advance),

assisting in reading ability testing and in the reading readiness program.

In Indonesia the following school principals and teachers have been intimately involved in program development:

Principals

1.	Mrs. Sudarti S. W.	Kebak II
2.	Mr. S. Wirjanto	Kebak III
3.	Mr. Hadisumarto	Malanggaten I
4.	Mr. S. Sudijono	Malanggaten II
5.	Mr. Djatmiko	Alastuwo I
6.	Mrs. Siti Salamah	Alastuwo II
7.	Mr. Hadisusanto	Banjarharjo

Seven village teachers are involved in Proyek PAMONG

Mrs. Sukarni	Kebak II	Indonesian
Mrs. B.S.Suwarsi	Kebak III	Applied Skills
Mrs. Sarmini	Malanggaten I	Social Studies
Mr. Suradi	Malanggaten II	Social Studies
Mrs. S. Harnani	Alastuwo I	Mathematics
Mr. Suratno	Alastuwo II	Mathematics
Mr. Supardi	Banjarharjo	Science

In the Philippines:

Principals

1. Mrs. Gil Largo -- Naalad Elementary School
2. Mrs. Flora Paner -- Pangdan Elementary School
3. Mrs. Carolina Mendiola -- Lutac Elementary School
4. Mr. Benito Tapao -- Balirong Elementary School
5. Mrs. Conchita Teo -- Uling Elementary School

Five grade four teachers are involved in Project IMPACT

Name of Teacher	School	Subject Matter
Mrs. Natividad Ramirez	Naalad	Science
Mrs. Evangeline Lara	Pangdan	Pilipino
Mrs. Dalisay Manugas	Lutac	Mathematics
Miss Lolita Tesio	Balirong	Applied Skills
Miss Myrna Repollo	Uling	Social Studies

3. Local Steering Committees

The understanding, participation and support of local communities will be key to the acceptance and success of IMPACT both because the project is truly community-based and because it represents a drastic change from traditional schools. IMPACT has been extremely fortunate in that the local steering committees (below) have been instrumental in gaining the support of parents and other community members.

In Indonesia the local steering committees are composed of:

1. The village head
2. The school principal
3. The chairman of the Parent Teacher Association
4. Some key persons in the village

In the Philippines:

1. The school principal, Chairman
2. The barrio captain, member
3. The president of the Parent Teacher Association, member

Functions of local steering committees include:

(1) Give full support to all the activities of the project;
(2) Disseminate information on community participation whenever needed;
(3) Hold regular periodic meetings in coordination with the Senior Staff and the Rural Education Coordinator for purposes of evaluating pupil progress and at the same time discussing problems of implementation;
(4) Serve as an operational body for monitoring a diary of what is going on in Project IMPACT.

4. Acceptance Strategies

An innovation which departs from the formal system of education needs an explanation. The traditional means of education cannot be done away with unless sufficient effort has been expended to render its substitute acceptable. The research study on non-formal education utilizing

community resources of all kinds -- parents, skilled workers, professionals, older students, material resources -- has to be understood by the community itself.

Determination of appropriate community resources and how best to use them, including how to motivate community participants to join in the effort is a major problem. Questions like why the student-teacher ratio is increased, why the teacher has become an instructional supervisor and no longer teaches, why the parent is now given the role of teacher with the responsibility of educating his child -- have to be answered.

There should be some means for orienting, encouraging and directing parents to take an active role in monitoring the self-directed learning of their children. No longer will parents be able to simply send their youngsters off to a school; they will be responsible for their children's learning activities.

A strategy had to be developed to prepare the parents for their new role. To do this, the community must first understand what the new project is all about.

Any change, any innovation or any departure from the customary will always be met with opposition and resistance. With this potential, negative attitude borne in mind, the Philippine National Steering Council and the Senior Staff of Project IMPACT held several meetings to map out strategies making the concepts of the project readily acceptable. It was decided that the Undersecretary of the Department of Education and Culture, Dr. Narciso Albarracin be the main

speaker for the first phase of the acceptance campaign held on January 8, 1974. The two phases of the acceptance campaign included:

1. A general meeting of the community leaders and municipal officials of Naga, Cebu together with the Governor of Cebu, Dr. Osmundo Rama, and Supt. Aurelio Tiro of the Division of Cebu, Supt. Carolina Panares of Central Visayas District, Supt. Pedro Aguilar of Cebu City, Supt. Pedro Calo of Mandane City, Supt. Leopoldo Etulle of Lapulapu City, Supt. Augusta Dimataga of Toledo City, Supt. Simeon Fernan of Danao City, Supt. Zoilo Tarona of Cebu School of Arts and Trades, and Supt. Camilo Alino of Cebu Normal College. This first phase of the acceptance campaign generated an encouraging response from the community.

2. The launching ceremonies in the different barrios comprised the second phase of the acceptance campaign. The Project Director, the Project Associate and the Subject Specialists took turns in discussing the philosophy, the plans and the proposals of the project. Printed handouts describing the history and background of Project IMPACT were distributed. Among other things, emphasis was on quality education and the utilization of community resources. The focus was on the high percentage of drop-outs, the out-of-school youth and the improvement of pupil performance through Project IMPACT. The use of self-instructional modules, it was pointed out, was intended to insure quality education for every child, reduce drop-outs and allow children to progress at their own rate. The involvement of the

community was also given enough stress. The lectures and open forum were conducted in vernacular. In spite of a heavy downpour, attendance in the meetings was highly satisfactory. Barrio leaders, parents, civic leaders and school personnel, officials and teachers were present at separate meetings held in each barrio in January. During these meetings, the local steering committees were organized and problems were discussed. Feedback from parents revealed their apprehension and misgivings. Parents were not so certain about their role in project IMPACT because of their very low educational qualification. Their fears were allayed by the assurance that they would be able to use other community resources for assistance.

In Indonesia,

Project PAMONG changes the concept of schooling drastically and can lead to doubts and resistance on the part of many persons unless it is presented correctly and honestly. We are confident that the project will lead to improved quality and relevance of primary education while, at the same time substantially reducing per pupil costs.

Acceptance strategies have been developed, and a series of acceptance campaigns has been carried out to insure parents, teachers, students, community members and administrator to accept and to support Project PAMONG.

The acceptance campaigns held by:

1. The BPP (Educational Development Office) Department of Education and Culture at the national level.
2. The Senior Staff of Project PAMONG in Surakarta and Kebakkramat.

In the acceptance campaign it has been emphasized that the purpose of the INNOTECH Solo Project PAMONG is to make an attempt at finding possible alternatives of effective delivery systems for mass primary education at low cost but at the same time retain quality education, which will meet the condition of most Indonesian/Philippir areas, and which could perhaps be beneficial to other SEAMEO member countries in the future.

In the detail the purpose of INNOTECH Solo Project PAMONG is:

a. Toward quality education;
b. Spreading out the opportunity of obtaining primary education;
c. Reducing drops-out.

The involvement of the community was also given enough stress in the acceptance campaign.

5. Overcoming Reading Deficiencies

In both countries, Grade IV is the first year in which the national language of instruction is used as opposed to local dialects. In the Philippines, English is taught in the first three grades and is used as the primary language of instruction in the fourth. Before that year, the Cebuano

language is not used in Naga. In Indonesia, the children of the village schools near Solo begin school speaking Javanese and must learn Indonesian which becomes the language of instruction at Grade IV.

Because most modules are self-instructional it is vital that (1) children's reading skills be adequate and (2) contents of the modules be in simple enough language to be understood.

At both sites, word and phrase lists were made from curriculum materials taken from all subjects covering the four months before the scheduled IMPACT start date and extending to two months after. For example, IMPACT in the Philippines was to start on 2 June (the start of the Grade IV school year). Therefore, texts and other existing instructional materials were prepared for the final four months of Grade III and the first two months of Grade IV.

Staffs developed lists from these materials of those words and phrases which they felt were necessary for learning. Samples of children were examined individually to determine their understanding. Children were asked to read the word or phrase and to explain its meaning (In these explanations, use of the local dialect by the children was acceptable.)

It was hoped that module developers would thus have a list of words and phrases understood by most children which could be used in the instructional materials. It was also hoped that the "not understood" list would be short enough so that the words could be explained when they first appear in the modules.

Results of these procedures showed that comprehension was totally inadequate for even the most simply worded instruction. In both countries, remediation programs have now been underway for at least two months with teachers conducting classes using primarily materials provided by the project staff. The remediation program in the Philippines drew children to school for at least one hour each day during the two-month school vacation.

Even these short-term remediation efforts were insufficient to overcome all deficiencies, and two further steps were taken. First, rather than including only one subject in a given school at the start of IMPACT, language was included at all schools, and students having difficulty with other subjects because of reading would be directed to concentrate on language modules.

Second, a set of twenty third grade reading modules was developed in the Philippines, and children are now progressing through them to the exclusion of other subject matters. (These materials will also be used in the schools next year in the final semester of Grade III.)

Remediation of reading difficulties is a problem that IMPACT should have to face only during the present developmental stage. Once the system is developed for the complete primary curriculum, modular instruction would be sequenced so that comprehension is assured before a child undertakes a given module.

6. Learning Materials and Procedures

A research field study with the magnitude of Project IMPACT needs a host of preliminary activities before the instructional materials can be prepared. In the Philippines and in Indonesia the pattern of preparation includes the following:

1. In-country meetings of National Steering Committee
2. Gathering of existing national objectives
3. Gathering of curriculum materials currently in use for grade four
4. Recruitment of village teachers to assist in apportioning subject matter for one schoolyear
5. Phasing of the project with the assurance that nothing is instituted without having been proved.

The above preliminary activities were successfully implemented in both countries.

The National Steering Committee approved the proposal of the Senior Project Staff to use existing objectives of the curriculum used for schoolyear 1973-74.

Each subject specialist gathered the existing teachers' guides in the different subject areas as well as all bulletins, memoranda and circulars from either the Department of Education and Culture or from the Bureau of Public Schools. From these materials were evolved the criterion-referenced objectives used for modular instruction. Another rich source

for objectives was the SEAMEO/INNOTECH project on Primary School Objectives, a comparison among SEAMEO countries.

Curriculum materials currently in use for grade four were gathered by the subject specialists as well as by grade four village teachers.

Staff and teachers went through existing curriculum materials to (1) identify and list fairly short segments of learning (termed "chunks" in the project vernacular), (2) develop an appropriate learning sequence of "chunks", (3) to specify learning objectives for each "chunk" and (4) to combine "chunks" into a single package for the development of 3-5 hour modules.

7. Makeup of a Module

What is a module? It is a learning package that can be undertaken by children with minimum or no involvement of a teacher. It can be self-instructional (and it usually is) directions to take advantage of the willingness of community resource persons to assist in special skill development, group activities, "buddy-system" learning in which children teach and test each other, etc.

No matter the form that the learning experience takes, a module has the following characteristics:

... A readiness test to insure that a child has the prerequisite skills/knowledge. (The readiness test is self-scored with instructions on what a child should do to make himself ready if the test shows that he is not.)

... An explanation of why the module is important/relevant.

... An overview of what is to be learned.

... A set of performance objectives.

... Instructions on how to learn from the module.

... Instructional materials interspersed with evaluation exercises and feedback.

... "Chunk" self-evaluation post tests, feedback and instructions for self-remediation.

... A review of what has been learned in the module.

In addition to the module proper, each module is accompanied by:

... A formal post-test to be administered by a teacher or tutor.

... Instructions to teacher or tutor on how to administer post-tests and remediate incorrect responses.

... Instructions to parents on how to monitor their children's learning activities.

... Instructions (as necessary) to community members assisting in skill training activities.

Modules are grouped into "blocks" of 4 or 5 related modules. The final module in each block is a review of all materials therein. A comprehensive block post-test is to be given at the learning center by the teacher (Instructional Supervisor) and will be her primary means to insure each child's progress.

The working papers on the next several pages present the IMPACT concept of the use of modules. The first working paper concerns the use of practice modules so that children will understand the process to follow in learning from a given type of module. The second paper clarifies the evaluation /remediation process to be used to insure student mastery.

PROJECT IMPACT
Working Paper

LEARNING HOW TO LEARN
April 1974

Those who are familiar with some of the original Project IMPACT concepts will remember the story of Moa Lia (a hypothetical newspaper report made in 1980 describing the experiences of a student, Moa Lia, in the IMPACT educational system). Moa Lia told the reporter that before beginning an instructional module he had to "learn how to learn;" he had to learn the procedures to follow for any given module. The report also said that the prime means for learning how to learn was a cassette player which was used in conjunction with the module simply to explain what process he was to follow, and he could replay the cassette until he was sure what he was supposed to do.

It is not a bad idea to use some form of standardized instructions which can be understood by all children (as shown by the difficulties students are having in tryouts in both Project IMPACT and Project RIT -- because they have to learn an instructional process entirely new to them). Instructions are

printed in each module and staff members ("teachers") take time to explain the process, but kids often end up confused.

However, the use of a cassette for each module in Project IMPACT is mathematically/economically impossible. We have projected one cassette player (plus one spare) per 200 children. The player would, on the average, be available to a given student less than two minutes each day (360 min. ÷ 200 students). We also have considered the use of the player for other instructional purposes (e.g. spoken language).

I propose to combine two possible solutions, but staff comments are requested.

First, add one more player ($25 - $35) per 200 students.

Second (and more important) standardize formats of modules. This suggestion by no means should be interpreted as one which would do away with the variety of learning experiences which is necessary both to maintain a high interest level ("learning is fun rather than boring") and to allow the development of what we consider to be the most effective instructional process for a given set of educational objectives.

What is recommended, however, is that the format for each given kind of learning process be standardized. For example;

> ... All small-step linear programs should have the same general format. The sequence through the programmed text should be the same, feedback is always found in the same relation to frames, etc.

... Short paragraphs followed by questions/feedback should always follow the same format.

... Pictorials and accompanying response/feedback sequences should follow the same format.

... The procedures in the use of flip-cards or flash-cards should be the same for all.

... Following instructions as a means for applied skill training (usually involving a community member as "teacher") should be as standardized as possible.

... Small-group or buddy-system learning should follow similar procedural rules.

... Use of cassette players and workbooks should have great process similarity.

... etc., etc.

There can be perhaps 20 or 30 such module types -- not the 1200 or so modules needed for the complete primary curriculum. Students, thus could learn the module types and not be confused when they meet the same type again.

How to "learn how to learn" the different module types? My suggestion is to prepare a practice module which is very simple while containing all the elements of the full-blown module. Use as content some fun (and funny) topics with an easily identifiable character. The character for each practice module should be different so that one type can be identified as a "Charlie Brown", another as "Felix the Cat", another as "Popeye", another as "Gordo", etc. Once learned, a "Gordo" type will be remembered as a "Gordo" and each full-blown module of this type should be thus identifed (perhaps with a small picture plus name of the character in a corner of the cover).

Each child will have access to all practice modules and be able to review them at any time.

Original learning of practice module procedures probably still should be assisted by a cassette which the children follow while going through the module. They should also be encouraged to ask anyone in the learning center (including classmates) if they are unsure how to proceed. At the time of module post-test and remediation (by tutors), the tutors should be instructed to make sure that each child has "learned how to learn."

PROJECT IMPACT
Working Paper

EVALUATION AND REMEDIATION FOR 100 PER CENT MASTERY
April 1974

A key concept of Project IMPACT learning is that all children will reach 100 per cent achievement. Learning is modular, ungraded and self-paced, and each child will achieve all the objectives of a given module before going on to another module. This level of achievement may seem unnecessarily severe on the surface, but since much learning is sequential the effects of less than 100 per cent achievement can be magnified over time because a child may not have the prerequisite knowledge necessary to successfully learn later modules.

Traditional methods of teaching are not so demanding on achievement levels because of the flexibility provided by the teacher. A child who is unprepared for a given lesson (does not have the prerequisite knowledge) can usually be given individual help by the teacher at any time during a class. The IMPACT

system, however, typically does not allow the flexibility provided by a classroom teacher, and children should possess prerequisite knowledge and skills before they undertake a given module.

Although severe, this insistance on 100 per cent mastery is a blessing in disguise because overall achievement levels of IMPACT students, almost by definition, should exceed those of students in a traditional school system. The topic of this paper, "Evaluation and Remediation", describes the process by which mastery is to be achieved.

There are three evaluation and remediation processes: (1) Self-Evaluation and Self-Remediation, (2) Tutorial-Evaluation and Tutorial-Remediation and (3) Teacher-Evaluation and Teacher-Remediation.

1. Self-Evaluation and Self-Remediation

Self-Instructional modules can take many forms, e.g.

... programmed texts

... work books

... flash cards

... instructions for group activities

... instructions for applied skills learning

... etc.

But, whatever forms modules may take, they have common characteristics:

a. Requires at least three hours to complete*.

b. Contains "chunks" or units of learning, each of which requires no more than 30 minutes to one hour to complete.

c. Gives the purpose (reason for learning) for the overall module and for each "chunk" within the module.

d. Gives explicit instructions (how to learn) for both the overall module and the chunks.

e. Presents explicit objectives (what is to be learned) at both modular and chunk levels.

f. Intersperses the learning experience with frequent opportunities for student response and feedback.

g. Summarizes (at both chunk and module levels) the most important things that have been learned -- insuring that these are consistent with the stated objectives.

h. At both chunk and module levels, gives a very comprehensive post-test, followed by a presentation of correct responses, followed by instructions by which a student can improve his understanding/skills which were shown inadequate in the post-test. It is this portion of the module that is described as Self-Evaluation and Self-Remediation.

The forms that self-remediation can take may vary.

(1) A student may be referred to specific pages in a module for relearning.

---

* A necessary requirement of the instructional management system for high student-teacher tatios.

(2) An explanation of why a given response is more appropriate may be given with the response.

(3) A student may be told to ask a peer's or older student's help.

(4) A student may be directed to go to the learning center and ask one of the tutors (older students who devote one hour each day to tutorial activities). Tutors, however, usually are only available in after-school hours and may not be asses sible at the time a student requires help.

(5) Rarely, the student may be told to go to the teacher ("Instructional Supervisor") who is in the learning center throughout the day.

The above possible types of remediation are at both the chunk and module levels of instruction and probably will come close to insuring mastery. A more-formal evaluation and remediation is given by the tutor at the module level (below).

2. Tutorial-Evaluation and Tutorial-Remediation

Tutors are older students who have been trained to administer formal modular post-tests, to score them and tc remediate as necessary in addition to being trained and to being supervised by the Instructional Supervisor, the tutors are provided with explicit instructions (guides) on how to score post-test exercises and how to assist a student in the remediation of those things inadequately learned.

Three notes:

(1) We anticipate a student-tutor ratio of some 5:1. Since each student will be available only one hour each day, the average daily contact (on a one-to-one basis) with a student is only 12 minutes. This limited time is the primary reason why the tutor works at the module level and why each module is at least three hours in length. Thus, a student would be expected to complete a module per day and to go to his tutor daily. (Students who progress at a faster pace will be encouraged to do so; they will be given a module in a different subject matter which they can work on while waiting for his scheduled tutorial time for taking the post-test on the module previously completed.

(2) The basic IMPACT concept of children studying on their own (possibly at home) and going to the house of his tutor (a neighboring older student) remains a possibility, but more likely students will study at the learning center (one big study hall) unless required to be home or away, and tutors all will report for one hour after school hours to the learning center where they can share tutorial and learning center responsibilities, insuring that a tutor is always available when a student is ready for module-level evaluation and remediation.

(At this juncture, we have only referred to tutors who are in post-primary school. At another time we will consider older primary school students as tutors or programmed teachers for younger children. In this case the one-hour-after-school rule need not apply; they could be scheduled throughout the day.)

Centralizing all activities at the Learning Centre should help the management system as run by the Instructional Supervisor a good deal.

(3) This paper is concerned with means for achieving mastery. The self-instructional process described early will, in itself, come close to insuring mastery. In addition, modules will be evaluated and revised throughout the IMPACT experiment so that they will eventually provide even more effective instruction. In the early going, students may go to tutors unprepared to take post-tests because they have hurried through their modules. The tutorial remediation process described below should, by its demands on students, tend to encourage them to be sure of their own mastery before going to their tutors.

Tutors will have three general avenues for remediation, depending upon the level of mastery a child exhibits on his module post-test. Although we should expect that students will have no less than 80 per cent mastery once they have been through the self-instructional process, tutorial procedures for less than that level will be made explicit. In general:

If post-test mastery exceeds 70 per cent, the tutor (following his guide for the module under consideration) remediates on a one-to-one tutorial basis helping his student relearn those instructional portions for which his knowledge/skill was shown to be inadequate on the post-test. Typically his guide would instruct him to go over and explain those specific portions of the

module not well understood. Once he is convinced that the student understands a remediated portion, he would present the student with a supplementary post-test exercise (often asking a verbal question) to insure himself that mastery is achieved. By remediating, portion by portion, a 100 per cent level of mastery would thus be achieved. (Module mastery would then be reported to the learning center so that the student can undertake a subsequent module.)

If post-test mastery falls between 50 and 70 per cent, the tutor (following his guide for the module under consideration) would not remediate on a one-to-one tutorial basis because it would be to time-consuming. Rather, he would assign specific portions of the module to be thoroughly reviewed by the student by himself. However, the tutor would explain how to do each of the assigned portions because we now suspect that many errors will arise from improperly understood procedural instructions. The student would return to the tutor (probably the next day), would take the same post-test again and would be remediated on specific items as above.

If post-test mastery falls below 50 per cent, the tutor would require the student to repeat the complete module. He would, however, explain how to do the module, ask the student about difficulties and try to overcome them. On repeating the complete module, the student would be required to repeat the post-test and to follow the remediation procedures outlined above.

In the same way that "chunks" are combined into modules, modules are put together as "blocks". A block contains approximately five modules of instruction plus a short review module of all essential learning within the block. We feel that periodic review of this nature is highly important for retention. The review module is treated like the other modules in that the tutor administers a post test followed by appropriate remediation.

A further post test for the complete block is given under the direct supervision of the Instructional Supervisor in the Learning Center. This block post test is comprehensive, covering all essential learning contained in the modules making up the block. It represents some one to two months of learning of a given subject under the traditional system. And it is here that the final evaluation and remediation takes place which insures 100 per cent mastery. Because it is administered under the direct supervision of the Instructional Supervisor, we are calling it for convenience: Teacher-evaluation and Teacher-remediation.

3. Teacher-Evaluation and Teacher-Remediation

The Instructional Supervisor is responsible for some 200 students. Assuming that she works 360 minutes (6 hours) per day and that one-third her time is given over to supervision and management rather than to instruction/remediation, she will have 2/3 time x $\frac{360 \text{ min.} \times 5 \text{ days}}{200 \text{ students}}$ minutes available per student per week: some 6 minutes per student. (Not much time for instruction). We should also assume that each student will complete one block per week and that the Instructional Supervisors will be responsible for block

post-test (evaluation) and re-instruction (remediation) for the block. If we further assume that older students are assigned to the Learning Center as both tutors and aides, many of the block post-test duties can be carried out by them: Administration and scoring of block post-tests and giving remediation as directed by the Instructional Supervisor.

> Note: The block post-test is the "final examination." It is the main means provided the Instructional Supervisor to monitor the progress of students (and the effectiveness of particular tutors). When we get some sort of contingency management system operating for tutors, it also will be the main criteria for tutor evaluation/reward.
>
> We would expect that after the earlier instruction, review and evaluation/remediation at the many levels that there would be little call for remediation at the block level. Some children undoubtedly will require no remediation at all, and the Instructional Supervisor need only allow a small portion of her "six minutes" to giving congratulations and social rewards (such as making the child's progress to all in the Learning Center). Thus, more time will be available for students in more need of remediation.

Having checked post-test results and (again following an explicit guide provided her) the Instructional Supervisor will have a number of remediation avenues open to her. Should a child fail on very few exercises, she should take her time to help them (again giving alternative post-test

exercises to insure that mastery has been achieved). If a greater level of failure is evidenced, she would turn the student over to one of the Center Aides for one-to-one remediation (using an explicit guide), but once the aide is convinced that mastery is achieved, it would be the Instructional Supervisor's responsibility to verify mastery.

WE ARE CONVINCED THAT 100 PER CENT MASTERY CAN BE ACHIEVED BY ALL STUDENTS IN PROJECT IMPACT.

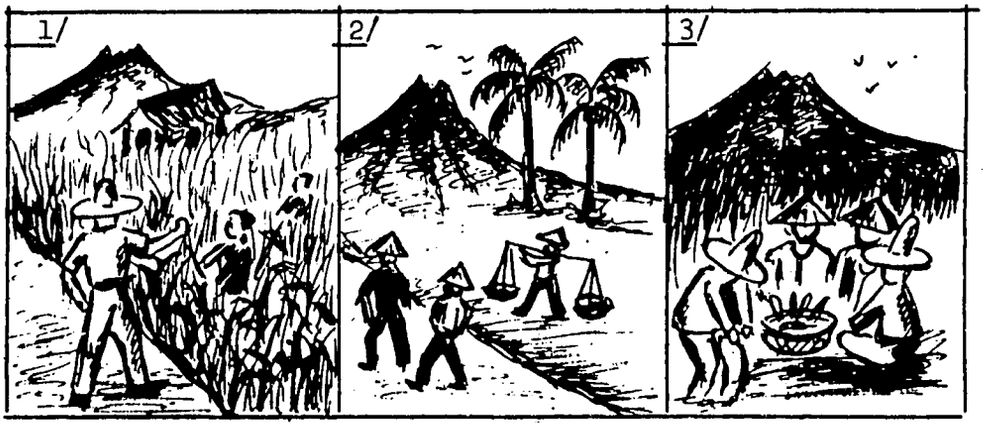
EXAMPLES OF MODULE CONTENT

Single pages from Indonesian modules are reproduced on the next several pages.

BANASA INDONESIA

3

Ramai orang memotong padi.



Amatilah baik baik keseluruhan gambar diatas. Kemudian amatilah sebingkai demi sebingkai. Gambar gambar itu menunjukkan oran sedang memotong padi.

Betulkah gambar gambar itu gambar orang memotong padi? Cocokkan jawabmu dengan kunci jawaban pada halaman sebalik ini!

PAHLAWAN TEUKU UMAR

Har i ini hari libur. Agus dan ayahnya sedang bercakap-cakap di ruang tamu. Coba dengarkan, apakah yang mereka percakapkan.

Ayah : Agus, apakah kamu sudah mempelajari perjuangan pahlawan DIPONEGORO?

Agus : Sudah ayah, pada pelajaran yang lalu.

Ayah : Bagus, apakah kau ingin mendengarkan seritera pahlawan kita dari Aceh.

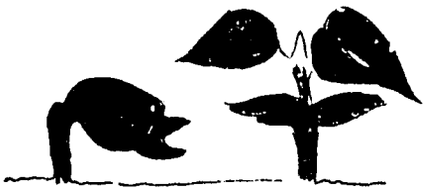
Agus : Tentu ayah, siapa namanya?

Ayah : Namanya pahlawan TEUKU UMAR. Coba perhatikan gambar beliau dibawah ini.

SCIENCE: INDONESIA

BINGKAI 4

PERHATIKAN GAMBAR DIBAWAH INI



biji kacang tumbuh

anakan pisang

setek batang tebu tumbuh

buah kelapa tumbu

Pertanyaan: Perhatikan gambar diatas, kemudian jawablah

1. Tumbuhan apa yang berkembang biak dengan biji?
   Jawaban:....
2. Tumbuhan apa yang berkembang biak dengan buah?
   Jawaban:....
3. Tumbuhan apa yang berkembang biak dengan setek?
   Jawaban:....
4. Tumbuhan apa yang berkembang biak dengan anakan?
   Jawaban:....

Answers from back of page:

Jawaban:

1. Tumbuhan apa yang berkembang biak dengan biji?
   Jawaban: kacang.
2. Tumbuhan apa yang berkembang biak dengan buah?
   Jawaban: kelapa.
3. Tumbuhan apa yang berkembang biak dengan setek?
   Jawaban: tebu.
4. Tumbuhan apa yang berkembang biak dengan anakan?
   Jawaban: pisang.

APPLIED SKILLS: INDONESIA

(Fish Farming)

SUKARKAH MEMELIHARA IKAN LELE

Memelihara ikan lele sangat mudah.
Ikan lele dapat dipelihara dikolam yang sempit.
Maka ditanah yang sempit, dapat dibuat kolam lele.
Ikan lele dapat hidup baik diair yang dangkal dan jarang diganti.
Dipekaranganpun, dengan air dari sumur dapat dibuat kolam lele.
Memelihara ikan lele lebih mudah dari pada memelihara ikan lainnya.
Misalnya ikan: gurami, tawes, karper dan lain-lainnya.
Ikan-ikan tersebut membutuhkan kolam yang luas dan yang selalu berganti.
Jadi dapat untuk memanfaatkan setiap jengkal tanah.

PERTANYAAN

Lingkarilah B jika betul, lingkari S jika salah.

1. B. S. Memelihara ikan lele lebih mudah dari pada memelihara ikan gurami.
2. B. S. Ikan lele harus dipelihara dikolam yang luas.
3. B. S. Kalau lele dapat dibuat ditanah yang cukup - sempit.

Answer from back of page:

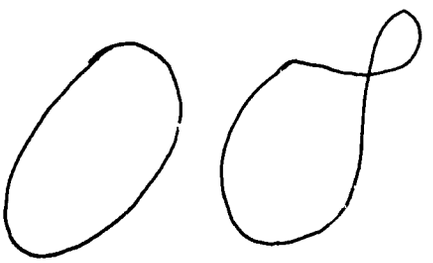
Kunci jawaban.

Kunci jawaban

1. (B), S.
2. B, (S).
3. (B), S.

MATHEMATICS: INDONESIA

Jika kedua ujung tali disambung, kemudian tali diletakkan diatas kertas dengan digerakkan, akan mendapat kemungkinan gambar-gambar:



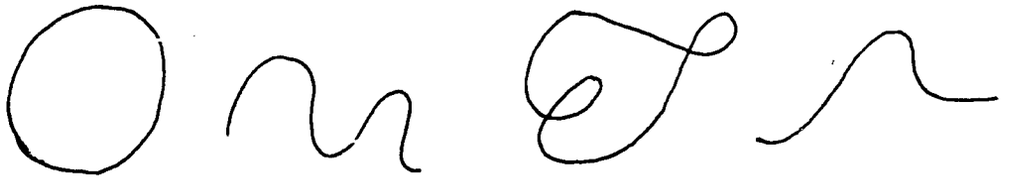
(1) (2)

(1) disebut Kurva tertutup sederhana

(2) disebut Kurva tertutup tidak sederhana.

Kurva dimana ujung-ujungnya tidak bertemu disebut <u>Kurva terbuka</u>.

(1) (2) (3) (4)



(5) (6) (7) (8)

<u>Kurva terbuka</u> adalah gambar nomor: .....

<u>Kurva tertutup sederhanan</u> adalah gambar nomor: ....

<u>Kurva tertutup tidak sederhana</u> adalah gambar nomor: ....

Answers from back of page:

Jawaban:

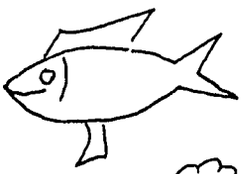
Kurva terbuka adalah gambar nomor: (2), (4), (6), (8)
Kurva tertutup sederhana adalah nomor: (1), (5)
Kurva tertutup tidak sederhana nomor: (3), (7)

Single pages from the Philippines are reproduced on the next several pages.

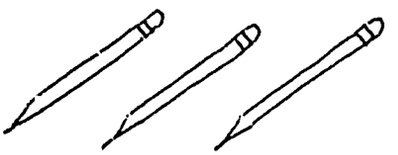
PILIPINO LANGUAGE

LAGYAN NG ANG O ANG MGA ANG PUWANG SA GITNA NG LARAWAN AT NG PANGALAN.

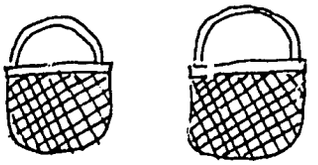
1.  _____ bulaklak

2.  _____ isda

3.  _____ batang babae

4.  _____ lapis

5.  _____ buslo



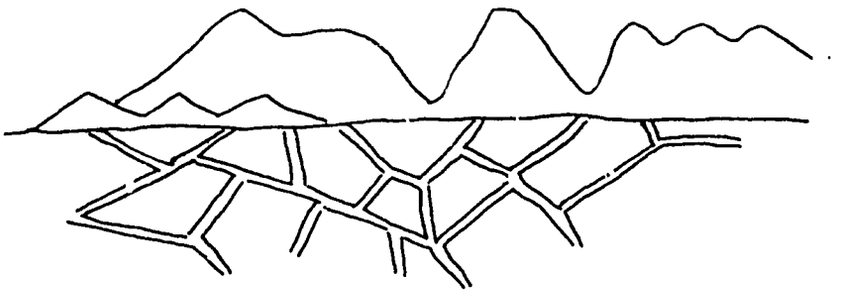
Answers from back of page:

1. ang mga bulaklak
2. ang isda
3. ang batang babae
4. ang mga lapis
5. ang mga buslo

SOCIAL STUDIES: PHILIPPINES

OBJECTIVE: You will learn to show on a map of Naga, the different land forms.

Here is a map of Naga with the different land forms:



What land forms are shown on the map?

_____

_____

_____

_____

Answers from back of page:

Feedback:

Plain

Hills

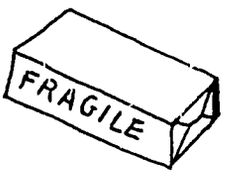
Mountains

Mountain Range

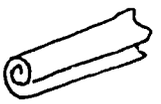
Valley

Plateau

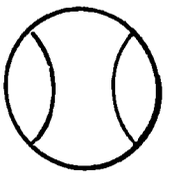
SCIENCE: PHILIPPINES



A box is a <u>solid</u>.



Paper is a <u>solid</u>.



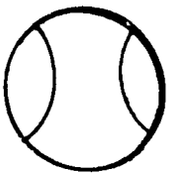
A ball is a <u>solid</u>.

Milk is <u>not a solid</u>.

Vinegar is <u>not a solid</u>.

Exercises from next page:

Write the word <u>solid</u> before the pictures below that are solids. Look at page <u>20</u> if you need help.

1. 

_____ 2. 

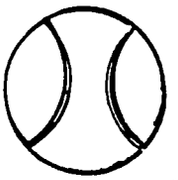
_____ 3. 

_____ 4. 

_____ 5. 

Answers from back of page:

Feedback:

solid 1. 

solid 2. 

_____ 3. 

_____ 4. 

solid 5. 

MATHEMATICS: PHILIPPINES

HERE ARE TWO PAIRS OF SETS FOR US TO STUDY. THE ELEMENTS OF THE SETS WILL BE INSIDE RINGS.

READ THE LEFT SIDE OF THE PAGE FIRST

THEN

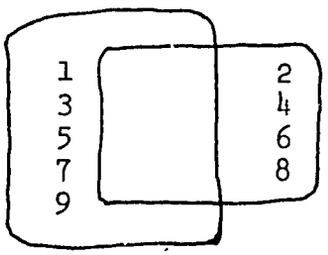
READ THE RIGHT SIDE OF THE PAGE.

My sets:

C = {1, 3, 5, 7, 9} D = {2, 4, 6, 8}

STEP ONE

WRITE THE ELEMENTS OF THE SETS INSIDE THE VENN DIAGRAM, LIKE THIS:

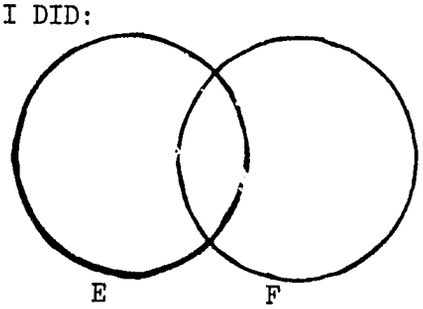


Your sets:

E = {rose, camia, adelfa} F = {gumamela, rosal}

STEP ONE

WRITE THE ELEMENTS OF SETS INSIDE THE VENN DIAGRAM, LIKE THE WAY I DID:



Answers from back of page:

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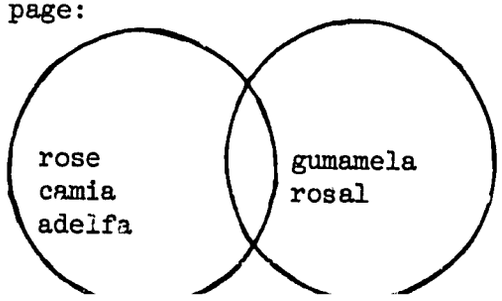

MODULES PREPARED TO DATE

In Indonesia 52 modules have been prepared, given tryouts in rural schools and revised. Some one-half of these have been typed and illustrated for Mimeographing. These 52 modules represent the learning content normally taught in the last trimester of Grade IV (September through December). The table below shows the number of modules (and "chunks") according to the month in which they are presently sequenced in the schools. The word "chunks" is used in both Indonesia and the Philippines to denote a cohesive segment of learning (comparable to a present-day lesson) that requires about one hour to complete.

INDONESIA: NUMBER OF MODULES PREPARED

SUBJECT	MONTH IN WHICH LEARNING NORMALLY TAKES PLACE IN SCHOOL								TOTALS	
	September		October		November		December			
	C	M	C	M	C	M	C	M	C	M
1. Bahasa Indonesia	8	2	8	2	8	2	8	2	32	8
2. Science	5	1	6	2	3	1	6	2	20	6
3. Mathematics	10	3	9	3	12	4	6	2	37	12
4. Geography	3	1	3	1	3	1	3	1	12	4
5. Civics	4	1	4	1	4	1	2	1	14	4
6. History	6	1	4	1	4	1	3	1	17	4
7. Home Economics	3	1	3	1	3	1	3	1	12	4
8. Farming (Field)	4	1	4	1	2	1	3	1	13	4
9. Handicraft	-	-	-	-	6	1	2	1	8	2
10. Poultry Farming	3	1	3	1	3	1	3	1	12	4
TOTALS	46	12	44	13	48	14	39	13	177	52

"C" refers to chunks. "M" refers to modules.

In the Philippines 272 Grade IV modules are targeted plus 20 Grade III modules for use in the reading readiness program. Of this total, 142 have been drafted and 27 have been printed and bound. The table below shows progress of the several steps in module preparation.

PHILIPPINES: NUMBER OF MODULES PREPARED

SUBJECT AREAS	Targets	STEPS							
		Draft	Edited	Lay-out	Typed	Illustrated	Printed	Collated	Bound
1. Language	35	7	7	7	7	4	3	3	3
2. Reading IV	35	12	5	5	5	0	0	0	0
3. Reading III	20	20	17	17	14	8	6	5	5
4. Science	32	21	15	15	12	6	6	6	6
5. Social Studies	40	18	10	10	4	3	3	3	3
6. Mathematics	50	24	22	22	12	5	4	4	4
7. Pilipino	45	18	9	9	4	2	2	2	2
8. Applied Skills	35	22	16	16	10	4	4	4	4
Total	292	142	101	101	68	32	28	27	27

7. Student Learning Activities

Student learning activities in Indonesia begin in early September 1974. In the Philippines, students have been "in school" under Project IMPACT since 2 June 1974.

As explained earlier, students in a given school learn only two subjects, one of which is always language, during this initial phase. Because the need for reading remediation is paramount at the start, all village children in the Philippines at this time are undertaking only the 3rd Grade English reading modules (20 in all) before progressing on to the two 4th grade subjects. As can be seen in the table below, individual progress rates already vary widely among the children. (The nine students on module #1 are still classed as non-readers and are being given individual attention by their teachers, and some of their more-able peers are helping out by tutoring them.)

BARRIO	NUMBER OF PUPILS BY MODULE				
	1	2	3	4	5
Balirong	2	0	12	9	3
Lutac	0	4	8	5	16
Naalad	4	12	22	2	4
Pangdan	0	8	21	10	13
Uling	3	12	10	3	6
TOTAL	9	36	73	29	42
PERCENTAGE	5%	19%	39%	15%	22%

At this stage modular instruction is taking place primarily at school, although children are encouraged to take their modules home. The 4th grade teachers act as "parents" in

monitoring learning activities, as "tutors" in giving module post-tests and remediation* and as "Instructional Supervisors" in managing all activities and recording progress.

Wall charts of student progress are maintained at the schools. More complete individual records are maintained on tutor report slips (shown below) and on Individual Module Progress Charts (next page).

SEAMEO INNOTECH
Naga Project Impact

_____Elementary School

Tutors' Report

Date: _____

Name of Pupil _____

Subject Area _____

Module No. _____

Problems encountered by pupils:

Chunk No. _____

Self test No. not answered: _____

_____

Difficult words: _____

_____

Difficult operations:_____

_____

Inaccuracy of drawing:_____

_____

_____
Tutor

---

* Several exceptions to the "teachers as tutors" have occured when the rural coordinators of the project staff have had to administer post-tests because teachers were "teaching for the test", thinking that failure reflected upon her teaching ability. This problem is being solved through weekly meetings with teachers.

INDIVIDUAL MODULE PROGRESS CHART

Barrio _____ Naga, Cebu

Name _____ Grade and Sec. _____ School Year:_____

SUBJECT AREA		MODULE																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Reading																					
Language																					
Mathematics																					
Science																					
Pilipino																					
Applied Skills	FA																				
	HA																				
Date Finished																					

_____
Parents

_____
Instructional Supervisor

At the completion of each module, a slip (below) is sent to a child's parents so that they can be informed of progress.

SEAMEO INNOTECH

Naga Project IMPACT

_____ Elementary School

Pupils' Progress Report

_____
(Date)

Ang imong anak, si _____

_____ nakapasar na sa

Module _____ sa _____

_____
Magtutudlo

The system of student progress records seems to be working very well as motivators (of both students and parents). Children cluster around the classroom charts as progress is marked, and they proudly carry home their parent report slips. Parents also are proud to receive the slips, showing other parents their own children's progress. (One parent in Uling came to the school to find out why her child had not received a slip. When shown the problems that the child was having, she asked "What can I do?" She was told to go over the module with her child -- which she did one whole weekend. Result: 100% score on post-test and the parent received her report slip.

PLANS

The schedules given in this section must remain tentative because our developmental strategy is one which requires smooth operation of the system at any given stage before progressing on.

Indonesia	Philippines	
September 74	July 74	... Begin student learning in two subjects in Grade IV.
October 74	August 74	... Orient parents and assign modules as "homework."
November 74	September 74	... Train older students as tutors and assign them to the learning center to administer post-tests and to give remediation.
April 75	January 75	... Expand student learning to all subjects at all schools (Grade IV in the Philippines and Grade V in Indonesia)
September 75	June 75	... Expand to grades IV, V and VI.

A P P E N D I X

Excerpts from the

Research Planning Document:

Setting Priorities for INNOTECH
Research on the Delivery of Mass
Primary Education (Singapore, 1 April 1973)

JUSTIFICATION FOR USING A SINGLE DELIVERY CONCEPT FOR INITIAL RESEARCH PLANNING

Integration of Research Projects

Research on delivery system components (materials, methods, etc.) should not be undertaken without some concept of the total system within which the components must function. To do research on ETV science programming, for example, or on inexpensive textbook production, on teacher training, on programmed instruction, on the use of radio for literacy training, or on any of a variety of possible delivery components - if done outside the context of some delivery concept - is to do research without clear direction. To do so represents the kind of research that could be carried on for years without bringing the total research programme very much closer to its main objective of developing a comprehensive delivery system. There must be a concept (or concepts) to give the needed direction to research efforts.

The Search for Alternative Systems

At the close of the February 1973 Seminar on Effective and Economical Delivery of Mass Primary Education, the INNOTECH staff concluded that the most productive approach for research planning would be (1) to postulate a number of potentially feasible delivery systems, (2) to determine the crucial components of each and (3) to design research on those crucial components which are common to several systems.

Following the seminar INNOTECH spent several weeks attempting to describe alternative systems which would meet the joint criteria of

potential feasibility, cost and effectiveness. The fact that feasible total system alternatives could not be postulated was an unexpected development; "there must be a whole range of potential systems." We are now satisfied that, although there is indeed a range of delivery components to satisfy specific instructional needs, the expected variety of total system concepts does not exist. And the reason for this conclusion is that the constraints within which the system must function do not allow much variability. Of the several constraints, cost is the deciding factor. (More on cost later.)

Purpose of a Single Delivery Concept

The staff has devised a single "delivery concept" which hopefully has sufficient flexibility to accomodate all reasonable components and which, itself, could be changed and reshaped (perhaps totally) based upon research results. Note that a distinction is being made here between "system concept" and the delivery system, per se. The "concept", as indicated previously, is the framework and general approach. A delivery system is a complete process of instruction and management, including all component materials and methods. Using a single system concept as a starting point will enable us not only to try out and modify (perhaps scrap) the system itself but also to try out a variety of components (methods and materials) which will be needed to make the system function. Development of a workable system per se represents our long-term objective, while development of components will permit INNOTECH to provide member countries with relatively fast payoff products for their adaptation and use.

The main criteria for a delivery concept are as follows:

... provide a generalized structure for delivery which is

flexible enough in design to permit extensive revisions on the basis of tryout results,

... be adaptable to a wide variety of instructional methods so that those most cost-effective for particular types of instruction can be used,

... be potentially effective as judged by present knowledge and typically using state-of-the-art methods of delivery,

... adaptable to different countries and cultures,

... particularly adaptable to rural conditions in which some 70% of the population lives,

... increase pupil retention rate by avoiding dropouts and repeaters,

... provide obvious and radical savings in per pupil costs.

JUSTIFICATION FOR ADOPTING THE COMMUNITY LEARNING CENTRE CONCEPT

Need for Making Preliminary Judgments on System Design

In designing INNOTECH's initial delivery concept we have consciously made a number of judgments about methods and materials. For example, we have decided that a single Instructional Supervisor is to manage the instruction of some 200 primary students. We have done so in order to be able to depict a total system whose various components can be tried out empirically. These initial judgments, therefore, provide the basis for INNOTECH research are the methods which are initially postulated feasible and cost effective? Are there better alternatives?

The judgments have been based upon the previously listed criteria,

and the one criteria which has most influenced the design is the need to radically reduce pupil costs.

Reduction of Per Pupil Costs

Educational budgets in most SEAMEO countries cannot be expected to be increased appreciably in the coming years. For planning purposes, we are assuming that the proportion of national budgets devoted to education will not increase.

Within the SEAMEO countries about one-half of primary age children are not in school. If mass (universal) primary education is to be achieved, pupil enrollments must approximately double. For planning purposes, we are projecting that per pupil costs will have to be cut in half (doubling enrollment without increasing budgets).

Need to Increase Student-Teacher Ratios

Teacher costs (salaries, retirement, training, etc.) represent some 80-90 per cent of primary education costs. Effecting drastic per pupil cost reductions, therefore, requires radical savings in teacher costs. Economies in relation to buildings, books, etc. cannot result in the needed reduction in costs. For planning purposes, therefore, we must concentrate our efforts on reducing the costs of teachers.

Present student-teacher ratios are on the order of 40:1. Doubling that ratio to 80:1 would seem as a logical target, but this change is unlikely to provide effective education within the traditional setting.

The use of double sessions can double enrollment, but teachers have

to be compensated for the extra work and the doubled enrollment requires an increase in textbooks and other materials. Double (or triple) sessions are directed primarily toward the reduction of building costs through multiple utilization of facilities; the reduction of per pupil costs to one-half cannot be achieved in this way. Multiple sessions are more appropriate for urban communities than they are for small rural villages which have fewer primary age children.

Recognizing that multiple sessions can only have a marginal effect on per pupil costs, one might consider doubling class size, but learning effectiveness undoubtedly would suffer.

Another alternative would be for students to go to school only half time. "Half time" can take many forms: (1) alternate days, (2) alternate months or a block of five months per year, (3) reduction of primary education from 6 to 3 years, etc. All of these approaches have the potential for providing mass primary education if methods and materials for doubling the efficiency of learning can be found. These methods and materials will have to be innovative and, probably, quite non-traditional, and their costs will have to be managed within the limited funds available.

In order for funds to be available for non-traditional instructional methods and materials, student-teacher ratios would have to more than double. For purposes of planning, therefore, a student-teacher ratio of 200:1 has been established as a target for the primary education delivery system.

What are the ways that a single teacher can effectively manage the education of 200 students (usually in different grades)? Three ways that are potentially effective are the use of mass media, the use of "non-teachers" and self-instruction.

Methods for Increasing Student-Teacher Ratios: Mass Media

Radio is a widely used mass medium. Transistor receivers are inexpensive and transmitting stations are available in every SEAMEO country; the possibility of educational radio as a means for delivering primary education economically is being considered by several countries. Can radio be the core for a new and economical delivery system? Probably not. Radio has previously proved of value in the upgrading of teachers and in various aspects of adult education such as agriculture and family planning, but it has not been used successfully as the basic medium for primary education. If, in setting priorities for INNOTECH, we accept the unlikelihood of its use as the basic medium of instruction, we should still consider it as an "adjunct" medium with the potential for accomplishing some instructional purposes for which it is uniquely capable. Such purposes may include some aspects of teacher retraining which are necessary for the success of a new delivery system, some types of community and parental orientation, etc. using it as a medium for information dissemination.

Ancther purpose which it may serve is one that is evident throughout the region: Second language training. About one-half of the children in the region grow up speaking a local language or dialect. When they come to school they must learn a new language, usually the national language, which is the medium of instruction. Radio may very well prove to be the most effective and economical means for teaching listening and speaking skills. Reading and writing can be learned relatively easily once a child has the necessary oral skills.

For planning purposes, we have noted radio as a potential special-purpose medium of instruction which may be used within the context

of a total delivery system. Materials to accompany radio instruction may be provided by correspondence or, more likely, through local education personnel.

Contrary to our acceptance of radio as one potential medium of instruction, INNOTECH has decided not to entertain ETV broadcasts as a potential delivery system. This decision is a matter of research priority and our judgment about ETV's potential for effecting the needed economies. Our judgment may be wrong, but it (and other similar judgments) have to be made so that our efforts can be devoted to delivery methods with the greatest promise of success.

ETV, admittedly, can be effective, particularly when supplemented by teachers through discussions, lectures and application. Properly done, it can provide valuable visual demonstrations which are beyond the resources of any single school. Our decision to downgrade broadcast ETV as a subject for research is not a reflection on its effectiveness; the decision has been based solely on costs.

Typically, ETV is an add-on cost which is justified by increased quality of instruction. Justified or not, it is an add-on that probably cannot be afforded within the financial constraints of most countries in the region. Teachers are still needed in about the same ratio (student-teacher) as before and the cost of classrooms and textbooks (or workbooks) probably are not reduced. The add-ons, however, can be extremely costly. Receivers, electricity (more than one-half of villages currently have no electricity) and maintenance are add-on costs at the school level. Transmission costs can be a tremendous additional expense: Broadcasting and relay stations, satellites, etc. Such costs cannot be afforded within the slim resources available unless ETV, at the same time,

has the potential for dramatic reductions in other educational costs. Since such reductions seem unlikely, INNOTECH will not include ETV in its initial research plan.

Video cassettes avoid the enormous costs of transmission and we may give consideration to their use within the context of a larger delivery system. Newspapers and magazines can serve as instructional media, but it is unlikely that they can be a primary means of instruction; instructional materials per se probably can be printed as cheaply.

Methods for Increasing Student-Teacher Ratios: Use of Community Resources. Community education and non-formal education are both concepts which have gained wide credibility in the region. Their focus is primarily on utilitarian learning by persons who are outside the formal system, although they often do encompass formal learning as well. They represent the attempt of communities to draw upon their own resources in a cooperative learning effort. Health workers assist in health education, agricultural experts attempt to upgrade agricultural practices through education and demonstration, persons who can read and write help in literacy programmes - those with special skills and knowledge contribute to the education of other members of the community. However, self-help programmes such as these need careful organization if they are to succeed, and a number of countries currently are assisting in the planning of community and non-formal education programmes.

Other uses of "non-teachers" include literacy training conducted by members of the military, the use of older children to teach younger ones and the use of community members and parents on teachers aides. The INNOTECH research on "programmed teaching" (training local adults, with only sixth grade educations, to teach first

graders how to read) is an excellent example of how "non-teachers" can contribute to primary education.

Done properly primary education conducted by "non-teaching" members of the community can be effective education. Equally important, it can also be economical. In planning the INNOTECH research programme, it seems clear that initial priority must be given to the use of local resources. The question is not whether we should use local resources, but how to use them most effectively.

Methods for Increasing Student-Teacher Ratios: Individualized Self-Instruction

Individualized instruction, in whatever form, can free teaching personnel from the tedious and time-consuming chore of classroom or tutorial teaching. If children can manage much of their learning on their own, and there is much evidence that they are able to do so, radical savings in personnel time can be effected. Programmed instruction, in its various forms, probably will become the one basic means of instruction in whatever system we consider. As was discussed earlier, INNOTECH envisions some form of guided self-instruction as one likely means of learning which can satisfy the dual criteria of effectiveness and economy. We do not intend to do extensive research on programmed instruction itself (i.e. step size, cueing, prompting, branching, feedback, etc.); our intention is to develop self-instructional materials of various kinds for use within a more total system. Programmed instruction is not a delivery system, but it may prove to be an important component of the system.

Summary of Research Rationale and Plans to this Point

1. Twice the number of pupils will have to be accomodated with no increase in funds.

2. Teachers account for the major proportion of costs, and a student-teacher ratio of 200:1 is set as a target for the delivery system.

3. Traditional methods, even with multiple sessions, probably cannot achieve the necessary economics; innovative approaches are necessary.

4. Student-teacher ratios of 200:1 may be achieved by using a combination of mass media (particularly radio), teacher aides and individualized instruction.

Management of Learning: Self-Directed

The teacher's role is under reexamination in many countries both because of the increasing costs of education and because of increasing demands on teachers' time and energies. This reexamination has shown that an inordinate amount of time is spent not in teaching but in monitoring social behavior ("policing") and attempting to influence children to do their studies*. The question that is being asked is whether these duties are the proper functions for teachers - and whether or not the responsibility should not rest with the community, the parent and with the students themselves. The question which INNOTECH should ask is whether it is possible for the teacher to provide the objectives, the materials and the methods for learning and leave it to the parents and children to

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* Administrative and "bookkeeping" tasks also take away from the business of teaching.

choose what is to be learned by each individual - and, perhaps, when it is to be learned. An approach, such as this, to self-directed learning would place a number of requirements on the delivery system: Self-instructional materials, measures to evaluate progress, close liaison between school and parent, teaching children how to use learning materials ("learning how to learn") and teaching parents how to help their children in the process of learning (not necessarily the content).

If, indeed, it is possible to concentrate the efforts of teachers on providing learning opportunities, teacher efficiency might be significantly increased, and per pupil costs might be dramatically reduced through the ability of a given teacher to provide learning opportunities to more children (increased student-teacher ratios). INNOTECH does not know if self-directed learning is a feasible concept for inclusion in a mass delivery system, but it should be tried out since its potential for decreasing per pupil costs is great.

Management of Learning: Learning Centres

Because resources are limited for education, a number of countries have tried to concentrate quality learning materials in a number of centres rather than trying to disseminate lower quality materials to each school. The intent is to enable all schools to draw upon the resources of the learning centres. Such centres may be permanently located and some may be mobile, visiting satellite schools on an established schedule.

This concept appears to have relevance in our search for a viable delivery system. Its relevance to INNOTECH research rests on its potential for insuring the multiple use of quality instructional

materials. Under an ideal traditional system, each child has a textbook for each course (perhaps four books at any one time) which he uses throughout a school term. "Chapter I" of each text is covered in the first week of the term, but each child carries "Chapter I" back and forth to school throughout the term; it is essentially wasted extra baggage. How much more economical it would be if the "Chapter I's" could be used by other students rather than being carried about. To do so, however, would require some kind of staggered progression of students so that all would not be at the same place in the instructional sequence at the same time. Joining the concepts of "learning centres" and "individualized learning" is one way of insuring multiple use of materials. As has been seen, economies associated with learning materials cannot have the same impact on educational costs as economies in teacher costs; nevertheless, the potential of the learning centre concept to provide quality materials at low cost should be recognized in planning the INNOTECH research programme.

Dropouts, Wastage and System Scheduling Flexibility

Traditional education provides for an orderly progression of students through the grades. If, for some reason, a child cannot stay with this progression (e.g. if he must spend up to six months per year helping his parents in planting and harvesting) he is left behind. If he does not find his way back into the "lock step" of formal education, he becomes a dropout and his inability to complete at least a primary education represents wastage (i.e. the time spent in school is "wasted"). If he does reenter school as a repeater, the repeated time is thought of as wastage. Undoubtedly many dropouts occur as described above, and means for further education of those who drop out are being sought through non-formal and community education. Can means to reduce dropouts and wastage be included in the design of a primary delivery system itself?

Obviously the lock-step progression inherent in the traditional system must be avoided since it is not flexible to other demands on students' time. If a child can exit and reenter the educational system whenever needed without the need for repeating, it would seem more likely that he would take advantage of this flexibility and continue his education. Should he then "graduate" from primary school at the age of seventeen rather than twelve, should he be considered a dropout? We think not. The concept of the learning centre and of various means or self-instruction may provide much of the answer to this problem. Extending the concepts of self-instruction and self-direction to the idea of a non-graded primary education probably can do much to overcome the dropout and repeater problems resulting from the traditional lock-step progression through school grades. The idea of using "learning modules" as the basic unit of instruction not only can permit multiple use of materials (the "Chapter I" on the previous page), but also it can promote a non-graded education in which every student progresses through learning modules at his own rate. Repeating of grades would thus be unnecessary since a child could easily reenter his own educational sequence should he have to interrupt primary education for whatever reason.

Teachers Role

Assuming that the majority of learning can be achieved without qualified teachers in classrooms, that learning materials can be made available through learning centres and/or radio, that self-instructional materials and the use of "non-teachers" are effective, the function of a teacher probably will become one of managing the instruction of 200 students. Basically, managing would involve providing for the learning experiences, the means whereby students can profit from these experiences ("learning how to learn"),

evaluating student progress and giving guidance. We picture the teacher as an "Instructional Supervisor" working out of a learning centre. Functions would include (1) select and train community members and older students in teaching, tutoring, giving special skill training, helping in the operation of the learning centre by keeping inventories and student records and evaluating student progress, (2) work with parents to insure that they can monitor their children's learning activities and (3) monitor student progress and provide assistance, guidance and means for remedial instruction. At this point, the exact duties of the Instructional Supervisor must remain vague; they will gain greater definition as different aspects of the system are tried out.

Summary Characteristics of the Community Learning Centre Concept

1. An Instructional Supervisor represents the only institutionally trained professional educator. The traditional teacher's role is eliminated, and the Instructional Supervisor acts as a manager of instruction providing the needed direction and organization in the use of a variety of learning resources. One Instructional Supervisor should be able to manage the instruction of 200 primary students.

2. Community members with particular skills (carpentry, homemaking, agriculture, health, religion, etc.) are enlisted to provide specialized instruction. They probably are unpaid volunteers who have been recruited by the Instructional Supervisor on the basis of a survey of community resources in relation to educational needs.

3. Other community members, who are primary school graduates, would be trained by the Instructional Supervisor to conduct

specific courses, i.e. beginning reading on a part time basis. Their training would be very specific to the course they teach, and they probably would function as programmed teachers. Some could assist in the operation of the community learning centre, including record keeping and evaluating student progress. They probably would be paid for their time at a relatively low rate compared to the Instructional Supervisor.

4. Older students would all be expected to assist younger students through tutorials and remedial instruction. They would be unpaid.

5. Parents would be trained to monitor the instructional activities of their own children and be expected to take responsibility for their children's progress. Students and parents jointly would be self-directed in terms of student progress, age of beginning formal education and age of completion.

6. There probably would be no particular age limits. Except for learning reading skills, students would not be encouraged to begin at an early age.

7. Education would be modular, each learning module covering the amount of instruction that would normally take one to two weeks. Each module would be designed for the learning of specific educational objectives and would contain both a readiness test and a post-test.

8. Many modules would be in the form of individualized instructional packages. Students typically would seek tutorial help from assigned older students whenever they experience difficulty.

9. Some learning modules would be in the form of small group instruction under the direction of teacher's aides from the community. Others would be tied to instructional radio programmes.

10. Printed modular materials would be reusable by other students as soon as they are completed by those who progress more rapidly.

11. There would be very few set class periods. Students would be able to drop out and reenter at any time.

12. Primary education would be ungraded; progress would be indicated by learning modules satisfactorily completed rather than by school levels (grades).

13. All materials and records would be maintained in the community learning centre.

LIMITATIONS ON THE SCOPE OF INITIAL RESEARCH

Resistance to Change

Since it has been concluded that the traditional system cannot be expanded to provide universal primary education within available resources, any system which will meet the need will probably be a radical departure. Whenever extensive changes are made in an established system, one can expect a great deal of resistance both from those who are part of that system and from those who, in the past, have held the system in high repute. Radical changes in the delivery of primary education undoubtedly will meet resistance of various kinds from policy makers, educators in the establishment,

teachers and teachers' unions, parents, etc. As innovators in a variety of fields have learned, the business of being a change agent is no easy task. Therefore, whatever delivery system is developed during the course of INNOTECH's research should be expected to have to overcome strong resistance; it will have to be "sold" to those who control, to those who operate and to those who use primary education.

The question which we face in giving direction to the INNOTECH research programme is not whether potential resistance to change should be given serious consideration. The question is when such systematic consideration can best be given. It is our firm belief that the problems of developing an economical system that will provide all children with an adequate education (the methods of delivery, themselves) are of such an order of difficulty that we must concentrate our initial efforts on this aspect alone. Within reasonable limits, the delivery methods that are tried out during the early stages of research cannot be inhibited by possible reactions such as: "parents are not used to this - they probably will think that the quality of education will suffer" or "qualified teachers are going to be out of work" or " the Ministry is planning a large-scale building programme contrary to what INNOTECH is developing" or " what are we going to do with the present textbooks?", etc. We must recognize that, given a means for economical and effective delivery, there would be a long period of transition before such problems of acceptance can be overcome.

Development of Educational Objectives

One extremely important question about primary education is what is to be taught - the objectives of primary education in terms of student achievements. The initial step in any research ad-

mittedly, must give its focus to objectives. However, INNOTECH does not plan to do so initially beyond developing explicit objectives based upon what is currently being taught. No attempt will be made (again initially) to revise and improve upon the content of the primary curriculum; the research will concentrate on methods of delivery.

This decision is solely one of timing. INNOTECH will be conducting research on models to develop primary education objectives at the same time that work on the delivery system gets underway. Rather than wait upon the results of our model-building research, applying the model to a specific location and obtaining the approval of decision-makers to use the results in designing a new curriculum (a minimum of two years' work) - the decision has been to go ahead with delivery system research and to incorporate methods for the development of objectives at a later date.

Funding Schemes

Means for increasing funds for primary education also will not be given early consideration. There probably are a number of such means, such as those used in the Barrio High Schools, but the decision is to concentrate on "efficient and economical" delivery rather than on means to increase funding.

Desirability of Mass Primary Education

As the INNOTECH staff gains additional experience and knowledge while trying to develop a feasible delivery system, there undoubtedly will be many other occasions when priorities will have to be set in determining what will and what will not be included in the research programme. However, one topic which will not be questioned

is the desirability of mass primary education. Some persons have pictured on over-educated population in which children who have received primary education have unrealizeable aspirations for higher levels of education. These are problems which INNOTECH would be pleased to address itself if only it could first help in the solution to the problem of mass primary education.

PROCEDURE FOR RESEARCH PLANNING

Introduction

Beginning in July 1973, INNOTECH will have 20 persons from SEAMEO countries on the professional staff, only 1 or 2 of whom are currently at the Centre. We feel it would be inappropriate to establish specific research plans now without involving those who will be conducting the research programme in its planning.[1] However, it is the responsibility of the present staff to prepare research recommendations as a basis for more-specific project design by the new staff. The recommended programme which follows, therefore, is intended as a working paper for use in a series of intensive staff planning meetings after INNOTECH's relocation to Saigon.

General Research Methods

The overriding goal of INNOTECH's research effort over the next several years must be the development of a workable system for

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1 The high annual staff turnover rate which has plagued the continuityof INNOTECH's programmes in the past should be much reduced in the future; the majority of staff applicants have indicated their intention to remain at least two years.

delivery of mass primary education. Piecemeal projects outside the context of this system development should not be attempted; staff size will be too limited to afford research which is not directed toward delivery systems. Even within the context of delivery systems, we must set priorities in terms of the potential contribution that a given study can make to system development.

As part of the search for a workable delivery system, a wide variety of products (methods, materials, etc.) will be developed which can be of use to member countries. Products of this kind will be evaluated in terms of their possible fairly immediate use by member countries. Those products with the potential for wide-scale use in the region will be developed and disseminated as prototypes. An example of such a prototype is the Programmed Teaching methodology which has been developed during this past year for the teaching of the Malaysian language to first grade children. The method will be disseminated to member countries this year as a prototype technique for using local community members without previous formal training to assist in the teaching of primary children. The development of products such as this is an essential function of INNOTECH; they represent a more-immediate payoff of the investment in the Center than can be possible if the total delivery system were considered as a single product.

Even though we have postulated a rough outline of a delivery system earlier in this paper, there is little doubt that this outline will undergo extensive changes as research progresses. We still may not be knowledgeable enough about the success and failures of a variety of delivery systems in other countries. The staff has read numerous reports and has talked with many

persons from other countries, particularly during the February '73 Seminar, but we did not at that time have our present focus on the problem, and we have not observed these systems in practice. Rather than reinvent the wheel, we will survey primary education delivery systems in selected countries as a basis for reorienting our present thoughts on a delivery system and for including components which have proved of value elsewhere.

In summary, three general research methods on delivery systems will be applied by INNOTECH over the next several years. The highest priority will be given to research on the development of a total delivery system. Second priority will be assigned to the development of research products which can be prototypes for fairly immediate adaptation and use by member countries. The third priority will be the conduct of surveys of selected systems in operation elsewhere.

A Five-Step Procedure for Research Planning

The five steps given below should not be considered as research outline; they are steps which will be followed by the staff in developing a research plan after INNOTECH's move to Saigon.

Step 1: Conduct a series of staff meetings in August 1973 as a basis for:

(a) revision of the present delivery system concept;

(b) formulation of crucial questions about the delivery concept for which we do not currently have sufficient information. Examples of questions:

... What methods are best to teach language skills to youngsters living in rural villages where

the language of instruction is different from that spoken at home? Is the use of radio the most cost-effective means for developing speaking and listening skills? Is programmed teaching most cost-effective for learning how to read? What other methods seem feasible? Will methods necessarily differ for different languages?

... What curriculum content can be taught using local persons as programmed teachers? Can programmed teaching be used for science, mathematics and social studies as well as for language? Can programmed teaching be used at all primary grade levels?

... What forms of self-instruction are most cost-effective? For what subjects, grade levels and languages are different types of self-instruction most appropriate? Can teachers be used as subject matter specialists to programme self-instructional materials? What is the best way to train them in programming techniques?

... Can parents and children in rural villages be self-directed in managing the children's education? What are the best means for the educational system to assist them in achieving self-direction? What should parents know in order to be able to help their children?

... What "learning how to learn" techniques are best for teaching students how best to benefit from self-instructional modules? Is the use

of tape cassettes the most cost-effective method?

... What methods are best to identify and match community resources with educational needs? Can these methods be applied by a teacher (Instructional Supervisor)? Will they differ for villages with different characteristics (size, economic level, etc.)? Will community members with specialized skills volunteer their time? How much time would be required?

... Can a method be developed whereby older students give remedial or tutorial help to younger students? What training must be given older students? Can the method be tried out in advance of developing a total delivery system - using present instructional materials?

... What minimum components will have to be developed before trying out the total delivery system?

... How would the management of learning by an Instructional Supervisor differ for villages of different sizes? Is the idea of an itinerant Supervisor feasible?

... What should be the specific content of a learning centre? In what quantities should different kinds of instructional materials be maintained? How will quantities differ among communities of various sizes? Is the

concept of a mobile learning centre for small villages cost-effective in comparison with a permanent centre?

... What is the most cost-effective means for producing printed modules for multiple use by students?

... How can a system whereby each student progresses at his own rate be best managed? Will provision for allowing a student to stop and restart his education at any time achieve its purposes of reducing tropouts and of making education compatible with other demands on youngsters' time?

... Can efficiency be increased so that a primary school education could be achieved in three years? How could the system be made adaptable to the idea of starting school at a later age?

... How could the system be designed to be compatible with other educational needs in the village - non-formal upgrading of previous dropouts, adult education, literacy training, etc.?

... Would members of rural communities accept the radical changes necessary for the system to function? Would the use of "non-qualified" teachers be accepted? What steps should be followed to prepare villagers to accept and support a new system?

... Etc., etc.

(c) The above questions are only examples of the kinds of crucial questions which would be developed during research planning meetings in Saigon. The questions which will be prepared by the staff would provide the bases for setting priorities among projects, whether they be reviews of the literature, visits to other countries to investigate pertinent aspects of the delivery of primary education or research conducts in the field. Following the research planning meetings, staff members would prepare definitive recommendations and designs for projects.

(d) Develop criteria for the selection of a site (or sites) for the conduct of research on the delivery system. Examples of criteria are:

... Is rural and typical of country,

... Has approximately 50 per cent (or less) of children currently receiving a primary education (or has a need to reduce educational costs),

... Includes some 5-10 villages of different sizes within fairly close geographical proximity,

... Contains a sizable proportion of children who do not speak the language of instruction at home (which typically is used beginning in the fourth grade),

... Has relatively easy access to Saigon,

... Exhibits a willingness of villages to participate in study,

... The country idicates willingness to participate and support a long-term project by:

(1) designating a site location which meets the previous criteria,

(2) appointing Ministry officials to act as a steering committee,

(3) appointing one or two project coordinators,

(4) appointing 6 to 8 primary curriculum specialists (good teachers in specific subject matters would be satisfactory) to develop instructional materials following training by the INNOTECH staff.

Step 2: Select site(s) for field research via correspondence and visits to SEAMEO countries.

Step 3: Make final staff assignments.

Step 4: Design detailed projects and schedules (field research, visits to selected projects in other countries, literature review).

Step 5: Begin projects.

Targets:

August 1973 : Step 1 (Research staff meetings to redesign delivery system concept, to set priorities for research and to establish criteria for field site location.)

October 1973 : Step 2 (Select site(s) for field research)

September 1973: Step 3 (Make final staff assignments)

November 1973 : Step 4 (Design detailed projects and schedules)

December 1973 : Step 5 Begin projects.

A Final Note on Delivery System Research

At the outset we indicated that priority would be given to research on the total system as opposed to research on system components. This focus can be maintained by two methods. First, be designing individual projects within the framework of the delivery system concept. Second, by getting into the field as soon as possible with a first approximation of the system. This note pertains to the second method.

A system concept can be tried out and modified even if research on its crucial components has not been completed. A system has certain characteristics that can be investigated in the field with less-than-optimum materials and procedures. For example, the delivery concept described earlier in this paper ("Community Learning Centre") calls for a wide range of self-instructional materials. Rather than waiting for research to optimize these materials, we propose training curriculum experts and teachers (as noted in the criteria for site selection) in simple programming techniques so that self-instructional modules could be made available for trying out the system. The concept also calls for the use of radio for initial language training; we could approximate this medium by tape recordings. Ultimately the system will call for optimum techniques for establishing educational objectives, but we could approximate this step

by deriving objectives from the materials currently being taught. The main point here is to use state-of-the-art and off-the-shelf methods and materials for testing and modifying the total system - and to insert improved methods and materials as they become available from our other research efforts - approximating, modifying, improving.