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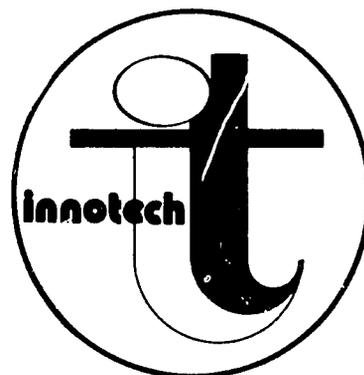
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REGIONAL CENTER  
FOR EDUCATIONAL  
INNOVATION AND TECHNOLOGY

# PROJECT RIT FOR MASS PRIMARY EDUCATION

PROGRESS REPORT No 1



August, 1974

INNOTECH/RIT-PR-1/74

PROJECT RIT  
FOR MASS PRIMARY EDUCATION

Progress Report No. 1

SEAMEO Regional Center  
for  
Educational Innovation and Technology

Saigon

August 1974

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## FOREWORD

This document represents the first complete report of the Reduced Instructional Time Project (RIT). The purpose of Project RIT is to find a delivery system for mass primary education in the SEAMEO Region. At the present time all of the activities of RIT are being conducted in Vietnam. The research staff of the Center is working in conjunction with a number of teachers from schools in Saigon. I believe that the efforts and dedication of the staff and teachers will allow Project RIT to meet the goals for which it has been established.

Project RIT represents only one of the approaches being undertaken in the Region in an attempt to provide a delivery system for mass primary education. INNOTECH is also conducting another project which we feel represents an alternative to the approach of RIT in trying to provide mass primary education. This is Project Instruction Managed by Parents, Community and Teachers (IMPACT). The purpose of this project is to determine the most effective way of organizing community learning resources into a meaningful learning system capable of achieving the objectives set for the primary cycle at considerably reduced costs, while making minimal demands on the formal school system.

Project IMPACT is currently being conducted in Naga, Philippines and Solo, Indonesia.

We, in Southeast Asia, have known for some time that we do not have the economic resources to keep imitating the educational approaches of the wealthier countries. We must find our own solutions to the problem of providing mass primary education. Exactly what the alternatives to the educational directions we are now taking will look like is difficult to say now. Nevertheless,

I believe that Projects RIT and IMPACT are very likely to lead us in directions which will result in fruitful new approaches for delivering mass primary education. I believe this to be true even if the final outcomes of both of these projects are different from their initial plans. The important thing is that we have taken our first steps on the road to developing new approaches for educating our youngsters. I am sure that RIT and IMPACT will make significant contributions toward finding efficient and effective delivery systems for providing mass primary education.

Pham Van Cung

Director

## ACKNOWLEDGEMENTS

We wish to express our appreciation to the Ministry of Education of the Republic of Vietnam for its assistance in allowing us to conduct the studies of RIT in the schools of Vietnam.

We would also like to express our gratitude to those schools which cooperated with us in designing our program and also in allowing us to try out some of our materials in their classrooms:

### Le Qui Don School

Director - Mr. Ho Van The

Assistant Director - Mrs. Nguyen Thoai Yen

### Tran Hung Dao School

Principal - Mr. Trinh Van Be

Assistant Principal - Mrs. Tran Thi Thao

### Cho Quan School

Principal - Mr. Nguyen Minh Hong

Assistant Principal - Mr. Nguyen Quoc Sung

Assistant Principal - Mrs. Duong Thi Chi

We would also like to thank all of the teachers from these schools who were so helpful in giving us information about their current teaching practices and also in reviewing some of our approaches for the RIT Project.

Finally we would like to express our appreciation to the Director of INNOTECH, Mr. Pham Van Cung, without whose confidence and support the RIT project could not have been started.

The RIT Research Staff

## INTRODUCTION

The Southeast Asian Ministers of Education Council (SEAMEC) instructed INNOTECH to carry out a project of Development of an Effective and Economical Delivery System for Mass Primary Education. The first step which INNOTECH took toward the implementation of this assignment was to hold a seminar on "Approaches to Effective and Economical Delivery of Mass Primary Education". The seminar was held in Singapore, February 19-23, 1973. Two major research efforts grew out of this seminar: Instruction Managed by Parents, Community and Teachers (IMPACT) and Reduced Instructional Time (RIT). The following pages describe the Rationale, Purposes, Design, Progress and Plans of Project RIT. A separate progress report describes these same aspects of Project IMPACT.

### Rationale

Only about one half of the children in the SEAMEO Region complete a primary education. At the present time the countries in the region do not have enough money to increase the number of teachers, buildings and textbooks which, under the approaches now being taken, would be needed to educate all of the youngsters who are now out of school. Alternative approaches to those now being used must therefore be found. Since limited budgets are a major constraint, the guiding principle for any alternative which we develop must be to reduce per pupil costs. Teacher costs represent the largest share of any country's education budget. It is therefore necessary, in order to decrease per pupil costs, to increase the number of children taught by each teacher. This will happen if we can increase the efficiency of the instructional processes.

Traditional methods of instruction are notoriously inefficient in every country. Teachers and students spend an inordinate amount of time on unessential activities. There are several different types of inefficient practices which can be seen in most schools.

One of the most obvious and probably the easiest to deal with, is to spend time in clearly non-instructional activities, such as record keeping, announcements and discipline. The performance of many of these tasks by trained teachers is as inefficient as trained doctors making the beds of their patients in hospitals. Another type of inefficiency exists in those instances in which the teachers spoon feed the students information which they could be obtaining by themselves. There are many learning tasks which could be performed by the students without the ever present guidance of the teachers. In many instances it would be better for the students to perform these tasks with as little guidance from the teachers as possible in order for the students to develop their independent learning skills as much as possible. There are many practice, memorization, and application activities which do not require the constant presence and guidance of the teachers. In addition to the inefficient practices of having teachers perform non-instructional activities and teacher directed instruction tasks which would be better performed by the students as self-instructional tasks, there is the use of instructional approaches in which many of the youngsters do not learn the material being taught, and those who do take longer than is necessary. Teaching which does not result in learning is perhaps the greatest inefficiency of all. When students take longer to learn what they need to, a good deal of the instruction they are receiving is also not resulting in learning. This instruction can be made more efficient, (and more effective) through appropriate design of the instructional programme.

Project RIT will try to help the present schools and teachers increase the efficiency of their instruction. The research will be devoted to trying to find ways of decreasing the amount of time students take to learn what they are being taught and at the same time decreasing the amount of time that teachers spend with their students. All of this research will, at least initially, be conducted in the existing

school settings. It will not be extended to non-school learning (mobilization of community resources, cross age-tutors, programmed teachers, etc.). Project IMPACT is currently developing these approaches. For the present, Project IMPACT will be exploring a number of non-school approaches and may move away from traditional school schedules, approaches, and traditions as is necessary in order to develop its approach as a delivery system to its fullest. Project RIT, will concentrate more directly on means for improving the in-school instructional process.

The possible outcomes of more effective/efficient learning probably lie in the rescheduling of classes. There are, of course, many different schedules which may be able to take advantage of more efficient learning. Students may go to school for three years instead of five years, they may attend school for two hours per day instead of four, they may attend school three days a week instead of six, or go to school six months instead of ten, or any number of other combinations which may result once we are able to reduce the amount of time needed to educate youngsters. The particular schedules which may be used will depend largely upon the particular circumstances, traditions and cultures (both national and local) in which the new instructional programs are to be accepted.

In order to maximize the effect of RIT, all of the new instructional approaches will try to reduce student/teacher interaction and at the same time reduce the amount of time which students take to master their lessons. At the present time, the amount of time which a student spends learning a lesson is a combination of the time he spends in class with his teacher plus the amount of time which he spends doing his homework. The student/teacher interaction is the amount of time that a teacher spends in class with her students. RIT intends to reduce both the teacher time and the student learning time. This can be illustrated thus:

	Now	Reduced Learning Time	Reduced Teacher Time	Overall RIT
Time Spent in Learning	TEACHER SELF	TEACHER SELF	TEACHER SELF	TEACHER SELF
Amount Learned				

Some explanations:

- ... suppose that learning now requires 30 minutes in class (teacher time) and 15 minutes of home work (self time) in order to learn one unit (amount learned), and
- ... suppose that through reduced learning time, the same amounts of time can be used to double the amount learned (i.e. 30 minutes in class and 15 minutes of home work allows students to learn two units rather than the present one unit), and
- ... suppose that learning, through reduced teacher time, will require only 15 minutes in class (teacher time) and 30 minutes of self study in order to learn one unit.
- ... suppose that overall RIT procedures can be developed that would both reduce student-teacher interaction and increase learning rate.

These examples are intended as illustrations only. In actual practice we may find some subjects in which we are able to save more than 50% of

the time while in other subjects we may find that we can save less than 50%. The actual savings which we will be able to make can only be determined after we try out the new instructional materials and approaches.

### Purposes

The overall purpose is to increase the efficiency of present school personnel and facilities so that an increased number of children can make use of them. In order to accomplish this we will use principles of effective learning to increase student learning rates and achievement and modify the instructional process in order to reduce student/teacher interaction time.

- ... Increase student learning rates. Students will acquire skills and knowledge in less time than they are now taking. This may mean that a student who now takes 30 minutes to memorize a set of history facts may increase his learning rate so that he is able to do the same thing in only 15 minutes or a student taking five hours to learn how to use an addition algorithm may be able to decrease this time to three or four hours.
- ... Reduce the amount of time that students and teachers interact. At the present time teachers in Vietnam spend approximately four hours per day with their students. We intend to reduce this as much as possible without increasing the total number of hours that a student spends in learning (in school plus out-of-school time). In other words the total learning time a student is now using will not increase but the amount of time that he spends with a teacher will decrease.

We believe that it will be possible in the near future to decrease both the time that a student takes to learn a given amount of material and the amount of time needed to be spent with a teacher.

## PROCEDURES

Project RIT has four phases leading to the complete revision of the way in which children are to achieve a primary education. Those phases are: (I) Try-out; (II) Experiment; (III) Redesign/Reschedule Total Primary Curriculum; (IV) Implementation, Demonstration, Revision of Learning Process.

### Phase I - Try-out

This phase takes representative samples of learning segments from the curriculum and redesigns the instructional procedures in order to achieve both an increase in the students' learning rates and a reduction of the student/teacher interaction time.

(Step 1) - Obtain information about the current Vietnamese primary curriculum. This includes the official schedule of subjects and general topics to be covered in each grade, the objectives for each subject, the schedule of topics to be covered each month and also the weekly schedules for each topic. The student textbooks and teachers' guides for grades 1-5 must also be obtained. Discussions with teachers will also be held in order to identify the actual teaching methodologies which are now being used.

(Step 2) - Select a representative sample of learning units. The topics selected must represent all of the different types of learning for all primary school grades and subjects which are required in the Vietnamese curriculum in order to permit us to apply the techniques we develop to the entire Vietnamese primary curriculum. Some 20 such learning segments are to be selected and each segment will represent about five hours of instruction (under present school schedules). For the try-out phase we will use only a portion of the total segment. The portion selected will require only 1 or 2 hours of instruction as presently conducted.

Rather than redesigning an entire curriculum all at once, we will sample the different types of learning in the curriculum. The subjects selected will be representative of the entire curriculum. This sampling procedure has advantages. One is that we will get rapid feedback on the strategies that we are trying out, another is that in a relatively short time we will have information which we can generalize to other subjects without taking the time to develop strategies for everything at the same time. Once we obtain information on the advantages and disadvantages of our approaches we can then expand and improve upon our initial work.

The following are some criteria for the selection of representative learning segments:

- ... The subjects selected should each represent a different type of learning task, for example: memorization, classification, discrimination, problem solving.
- ... The learning tasks and subjects should be typical for a given grade or even typical of more than one grade if possible.
- ... The learning segment should lead to a fairly definite outcome as opposed to being a common thread which is worked on over a long period of time such as increased language proficiency, (if this is possible without sacrificing a given type of learning).
- ... A learning segment in which a student either increases or decreases some skill or behavior should be avoided (again, if possible in the sampling). If this is not avoided, the difficulty is that the students' initial performance must be carefully measured in order to determine the amount of change which actually takes place.
- ... The learning segment should not be a part of a sequence which requires readiness skills. This will allow us to teach the segment at almost any time without disturbing a sequence. If this criterion cannot be met however;

- ... The segment should be one that is going to be taught at the time of the year that our materials will be ready for use.
- ... The segment that we choose must be one which is actually taught by the teachers as opposed to ones which are listed in the monthly schedule but for some reason or other are omitted from the teachers' own schedule. It obviously makes no sense for us to try to teach something which teachers are not now spending any time on.
- ... The overall criterion, however, is that all sampled segments, taken together, are representative of all types of learning in the total curriculum. It is better to overselect than to underselect.

Twenty such units have been selected. See the table on the next pages.

RIT  
SELECTED LEARNING UNITS

SUBJECT	GRADE	MONTHS TAUGHT (Present Schedule)	TOPICS	NO. OF LESSONS
<u>VIETNAMESE LANGUAGE</u>				
Reading Comprehension, Recitation	IV	Part of Jan. Part of Feb.	1. Countryside. 2. Communication & Transportation	11 8
Writing & Reading	I	August	1. Introduction to writing and reading 2. Write short text about what they learn	7
Composition	III	September January	1. Fill in sentences with "bi". 2. Description of animals and trees	2 4
Dictation	II	Oct. & Nov. Feb. & March	1. The human body 2. The family	8 8
Vocabulary	III	Part of March and April	1. Clothing 2. The countryside	11
Grammar	IV	January	1. Coordination, Conjunction, and Exclamation 2. The statements: interrogative and negative sentences	8 5
Penmanship	III	November	1. Capital letters: C, D, E. 2. Capital and medium letters: V, U, A, M.	8

RIT  
SELECTED LEARNING UNITS (Continued)

SUBJECT	GRADE	MONTHS TAUGHT (Present Schedule)	TOPICS	NO. OF LESSONS
<u>GENERAL SCIENCE</u>				
Science	III	Oct. and Nov	Plants	10
Hygiene	II	Part of Dec. and Jan.	Food/Drink	9
Science	I	April and May	Time	10
Science	IV	March	Transformation	10
<u>MATHEMATICS</u>				
Metrics	III	Aug. and Dec.	1. Linear measurement 2. Weight	6
Arithmetic	I	Oct., Nov, Dec., and Feb.	1. Addition 2. Subtraction	11
Arithmetic	IV	January	Fractions	7
Geometry	II	Sept. and Oct.	1. Square 2. Parallelogram	3
Arithmetic	III	February Part of Dec. and Jan.	1. Multiplication 2. Division	6 5
<u>SOCIAL SCIENCES</u>				
History	V	Dec. and Jan.	French Occupation	11
Morals	II	Part of Jan. and Feb.	Duties toward others	9
Geography	III	April	Geography of Vietnam	8
History	IV	Part of Feb. and March	Le Loi	10

(Step 3) - Design 2-4 different RIT approaches for a 1½ hour portion of each unit and try the approaches out in Vietnamese schools. In preparing for the design of the mock-ups, the content and the various types of learning must be identified. The next step is to state the behaviors which are expected of the students in order for them to demonstrate their mastery of the lessons. This information is then presented to members of the staff who brainstorm ideas for various approaches which can be used for the teaching of the materials. The staff then selects 2-4 of the approaches which seem to have the best potential for increasing the learning rates and at the same time decreasing the student/teacher interaction times. These approaches are produced and then tried out in some primary schools in Vietnam. The approach in which the students exhibit the greatest increase in learning rate and in which the student/teacher interaction time is reduced the most is then selected to be used in the experimental phase of these procedures. (Phase II).

In developing new instructional approaches we will attempt to apply at the outset what we are calling principles of effective learning. We believe that effective learning is a necessary pre-condition for efficient learning. The INNOTECH staff has, therefore, compiled a list of principles for learning effectiveness which will be applied to a variety of experimental approaches in our search for learning efficiency and Reduced Instructional Time:

- ... CLEAR STATEMENT OF OBJECTIVES. Before trying to teach anyone anything it is necessary to state the objectives of the instruction. The objectives should be stated in a way which allows them to be measured. They should deal with tangible, observable behaviors or products of the learners.
- ... CLEAR DIRECTIONS ABOUT HOW TO LEARN. Information should be given to the student which tells him how to acquire the skills or information that he is trying to learn. These may give him directions

about the best way to memorize some materials, practice an arithmetic skill, apply an algorithm, or any of the many other behaviors which will be expected of him. Instead of simply giving the student materials and telling him to 'learn' them he should be told some of the ways to study or practice the materials.

- ... WHAT PERFORMANCE IS EXPECTED OF THE STUDENTS. The students should be told what behaviors or products will be expected of them as a result of going through the lessons. This may be presented to the students in the form of questions which they will be expected to answer, problems they will have to solve, discriminations or generalizations they will have to make, etc. The point is that the students should know what will be expected of them after they complete the lessons.
- ... AN OVERVIEW OF WHAT IS TO BE LEARNED. Let the students know what the general content of the lesson will be. This allows the students to see the forest before they begin to examine each of the different kinds of trees. Telling the students what performance will be expected of them is like telling someone the destination of a trip. Telling the students the overview is like telling someone how they are going to get to the destination and what they can expect to see along the way.
- ... OPTIMUM SIZED LEARNING TASKS. The tasks which the students are asked to perform should be designed in small enough steps for them to progress from one behavior to another as smoothly as possible. If the steps are too large many of the students will not gain the skills, whereas they could have had the steps been smaller.
- ... PERIODIC REVIEW, SELF-EVALUATION, CORRECTION, AND REMEDIATION. At various points in the lessons the students should be given some review of what they have been doing. Without this it becomes very easy to lose whatever skills or information have been learned. They should be allowed to evaluate what they have been learning.

It is important for an individual to see the progress he is making. In order to self-evaluate feedback must be provided to the students which allows them to see the correct performances or products they are working on and then compare what they have done with the feedback. Once this is done the students should correct any errors they may have made. It has been shown that students who correct their errors perform significantly better than students who see the correct answers but do not correct their errors. If a student is not making progress he will need some additional help. Provisions should be made for some types of remedial help from tutors, review of the same materials or the use of alternative approaches.

- ... ACTIVE LEARNING. The students should be doing something which is necessary for the learning. This is different from the passive role which is assigned to many students now. Instead of spending a lot of time listening to or watching the teacher doing something, the students should be directly involved in learning activities themselves. What is important is what the student does rather than what is done to the student.
- ... STATEMENT OF WHY THE STUDENTS ARE LEARNING THE SKILLS OR INFORMATION. The students should know the purposes of their efforts. These should be related to the possible applications of what they are learning, to further learning and to real life situations.
- ... APPLICATION OR USE OF WHAT IS LEARNED. The students should be given the opportunity to practice what they have learned. It is the practice which allows the students to both develop and maintain the skill they have learned.
- ... INTRINSIC OR EXTRINSIC MOTIVATION (INCENTIVES) TIED TO SPECIFIC ACCOMPLISHMENTS OF THE LEARNER. Desirable consequences should be provided for performed learning tasks. These can be information given to the student on the success of his behaviors or incentives

which the students can earn by correct performance. For some students the intrinsic rewards produce a great deal of motivation. Many other students however may require extrinsic rewards or incentives in order to become motivated. As long as the incentives used are in no way harmful to the students, both intrinsic and extrinsic incentives should be used.

- ... TEACH OTHERS WHAT HAS BEEN LEARNED. One of the best ways to learn something is to teach it. Students should be given the opportunity of teaching other students some of the things which they have learned. The other students can be younger or of the same age.
- ... TRANSLATION OF WHAT HAS BEEN LEARNED INTO A NEW CONTEXT. This allows the students to generalize what they have learned. There is a danger that the students will only be able to use a skill in a limited number of situations if they are not given a chance to use it in a variety of contexts.
- ... USE OF CLEAR, SIMPLE LANGUAGE. When instructions are given to the students the writers should not try to impress the students with their erudition but should make sure that the language is simple and clear enough for the students to follow the directions. If the students cannot follow them the directions should be rewritten before accusing the students of being dummies.
- ... USE OF VARIETY WITH BOTH THE LEARNING TASKS AND THE INCENTIVES. Variety will generate both enthusiasm and motivation just as surely as a lack of it will create boredom and disinterest. The perfect teaching procedures do not exist any more than the perfect incentives exist. It is therefore a good and safe idea to introduce a variety of teaching procedures as well as a variety of incentives.
- ... INTERACTION WITH OTHER STUDENTS. Students should interact with each other in both small and large groups. The interaction can be through games, exchange of ideas, helping sessions, critique sessions, joint projects, etc.

- ... ACCOMMODATION OF INDIVIDUAL DIFFERENCES. This can be accomplished most effectively through the use of self-instructional materials which are used on an individual basis. If students are not allowed to progress at their own rates the slower ones will not master the skills and the fast ones will get bored.
- ... USE WELL ORGANIZED LESSONS. The lesson plans which are used should describe both student and teacher activities rather than just indicating the content which is to be covered.
- ... USE OF THE PRINCIPLE OF "LEAN PROGRAMMING". We should not take the time to teach things that the students have already learned. If they know the information or have mastered, and maintained, the skill, don't teach it again. The fairly obvious way to accomplish "lean programming" is to test the students before you teach the materials. If they demonstrate their knowledge or skills -- don't teach the lessons again.

This list is not all inclusive but we feel that it does represent most of the key elements of effective teaching and learning.

#### Phase II - Experiment

This phase will run from December 1974 through April 1975. It is a large scale experimental program which will benefit from the results of the try-outs conducted during Phase I. A single "best" approach will be selected for each of the 20 types of learning at the several grade levels. The selections will be made from the 2-4 different approaches which were tried out. The "best" approach will be the one which produces the highest learning achievement, requires the shortest student learning time and the least amount of student/teacher interaction. The selected approaches will then be developed as procedures with corresponding instructional materials for five hour segments of learning. The approaches will be tried in both urban and rural schools in Vietnam. When applied to

real school situations, the results of the several approaches will be compared to the results now being obtained in conventional school settings. The three general criteria to be used in these comparisons are: (1) student achievement (effectiveness), (2) student time to achieve the criteria (learning rate), and (3) the amount of time that teachers must be involved in the learning process (teacher time). It is anticipated that the longer use of the new approaches during this experimental phase may identify some weaknesses in some of the approaches which were not seen during the shorter tryout phase. Time will then be made available for whatever further revisions are necessary. The total analysis of the results will undoubtedly lead to a lengthy revision of the total primary education learning process in the third phase.

The schedule of activities for Phases I and II is presented on the following page:

## SCHEDULE OF ACTIVITIES OF PROJECT RIT (APRIL 1974 - APRIL 1975)

	APRIL	MAY	1974	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL 1975																																										
	16	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	31	7	14	21	28	4	11	18	25	30
<b>VIETNAMESE</b>	READING COMPREHENSION/ RECITATION Countryside/Com. & Trans.																																																							
<b>LANGUAGE</b>	COMPOSITION Fill in with "bi" Desc. of Animals & Trees																																																							
	WRITING & READING Intro. to Write & Read Shortest																																																							
	DICTATION Human body/Family																																																							
	VOCABULARY Clothing/Countryside																																																							
	GRAMMAR Coor. Conjun. & Exclam./ Interro. & Neg. sentences																																																							
	PERMANSHIP Cap. C, E, D/ Cap. & Low V. u. a. m.																																																							
<b>GENERAL</b>	SCIENCE Plants																																																							
	HYGIENE Food/Drink																																																							
<b>SCIENCES</b>	SCIENCE Time																																																							
	SCIENCE Transformation																																																							
<b>MATHEMATICS</b>	METRICS Linear/Weight/Capacity																																																							
	ARITHMETIC Addition/Subtraction																																																							
	ARITHMETIC Fraction																																																							
	GEOMETRY Square/Parallelogram																																																							
	ARITHMETIC Multiplication/Division																																																							
<b>SOCIAL</b>	HISTORY French Occupation																																																							
	MORAL EDUCATION Duty towards others																																																							
<b>SCIENCES</b>	GEOGRAPHY Geography of Vietnam																																																							
	HISTORY Le Loi																																																							

- |                  |                              |                    |              |                                     |         |            |
|------------------|------------------------------|--------------------|--------------|-------------------------------------|---------|------------|
| INITIAL DESIGN   | Initial Ideas                | Brainstorming      | Critique     | LOOK UP PREPARATION                 | TRY OUT | EXPERIMENT |
| Mini Translation | Preparation of Brainstorming | Selection of Ideas | REPRODUCTION | ANALYSIS AND EXPERIMENT PREPARATION |         |            |



### Phase III - Redesign/Reschedule Total Primary Curriculum

The efforts of 24 professionals will be required for two years to develop all learning materials and procedures for the five-year Vietnamese primary curriculum. What has been learned through the tryout and experimental phases will guide this endeavor, but the efforts of this phase must be coordinated with a change in the school schedules. Only the results of the tryouts/experiments will indicate which of a variety of school schedules is the most feasible. For example, the results of the experiments may indicate that school time can be reduced from four to two hours per day, from ten months to five months per year, (in school for five months, out for five, or school every other day or every other week), etc. The chances are that the results will indicate that several different schedules for reducing student time in school will be possible. The decision of which one to choose must be made by the Ministry of Education of Vietnam along with any other official units of the government who will be concerned with the changes to be made. A decision on the part of the officials of Vietnam concerning the type of schedule which they wish to introduce as well as a commitment on their part that they will allow the new schedules to be used in the schools will all be necessary before the work of Phase III can really be begun. It will be during the Phase II development that the structure and schedules of the RIT curriculum will be clarified.

### Phase IV - Implementation, Demonstration, Revision of the Learning Process

Once the materials and schedules have been completed they will be used as the actual curriculum in schools in Vietnam. (It is likely that Phase III and Phase IV will also be conducted in one other SEAMEO country. If this is the case the other country selected should be using a different type of curriculum than Vietnam in order to be able to generalize the model and the strategies developed in the RIT project in Vietnam). We will then be able to determine the value of the new

RIT curriculum under day to day actual classroom use. This phase will require a minimum of two years in pilot schools in order to insure the Reduced Instructional Time can be made a reality.

## PROGRESS

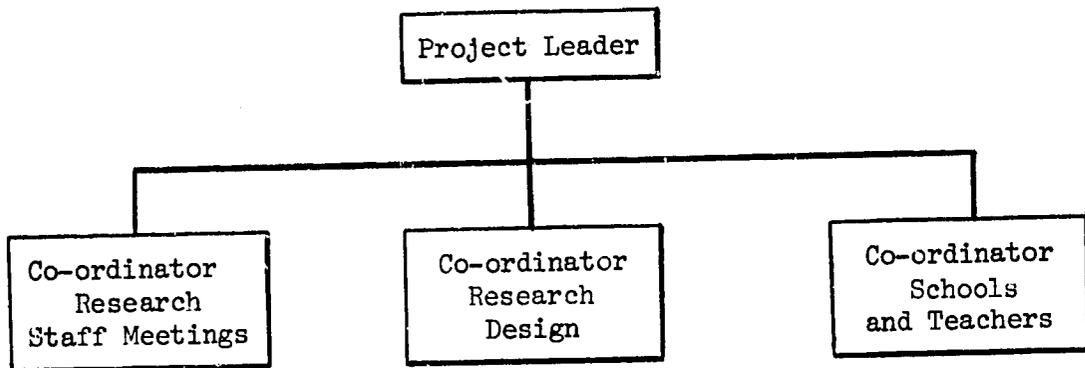
1. Staffing

Project RIT has had an international staff of nine people.

Dr. A. O. B. Situmorang	Senior Specialist Project Leader (Indonesia)
Mrs. Nguyen Ngoc Chau	Associate Specialist (Vietnam)
Dr. F. C. Gloria	Senior Specialist (Philippines)
Mrs. Do Ngoc Lien	Associate Specialist (Vietnam)
Miss Nuanchan Potar	Associate Specialist (Thailand)
Mrs. Sunan Patamachome	Associate Specialist (Thailand)
Dr. Nguyen van Thuy	Senior Specialist (Vietnam)
Mr. Ouy Vanthon	Associate Specialist (Khmer Republic)
Miss Joan-Frances Tuck	Assistant Specialist (Canada - CUSO)

Two types of organizational structures have evolved which will facilitate carrying out the activities of the project. One of these is for purposes of coordination and the other is for purposes of development of instructional materials and procedures. For coordination

purposes, the following positions were developed and assigned:



The project leader is responsible for the proper progress of the entire project. This generally translates into seeing to it that the schedule of activities is being followed fairly closely. It also involves identifying any weaknesses in the schedule or the actual performance of scheduled activities and finding corrective measures for the weaknesses.

The Co-ordinator of Research Staff Meetings became necessary because of the large number of meetings necessary in order to go through the process of developing materials. The co-ordinator schedules meetings on the request of the various subject-matter teams (see below) and notifies all research staff members.

The Co-ordinator of Research Design is responsible for developing and supervising the design for the research project. This is done with a team of staff members and all of the projected designs are reviewed by the entire staff. At this point we do not anticipate the need for a great deal of sophisticated statistical designs and analyses. The research questions that we are working on are fairly straight forward - did we reduce the amount of instructional time -- by how much -- and did the students perform as well as or better than the students in the

traditional classrooms? One of the main jobs of the research team will be to make sure that the experimental groups are comparable to the control groups, that what is being taught is the same and that the parameters of time and performance are measured carefully and correctly. The co-ordinator will not be expected to come up with the design but rather to see to it that the meetings of the staff are held and that the results are adequately discussed and reviewed with the rest of the staff.

The Co-ordinator with Schools and Teachers makes arrangements with teachers through their schools to come to the centre to assist the research teams as needed from time to time, and also makes appointments with the schools for class observation, and for the trying out of materials in actual classes. All of the schools in Vietnam use the same basic schedules. However they do not all follow the same sequence. For this reason one of the most important jobs of the co-ordinator is to see to it that the production of the RIT materials coincides with the teaching schedules of each of the experimental schools.

For purposes of development of instructional materials and procedures all research staff members, including those assigned to the four boxes of the organizational chart above, but excluding the research advisors, are assigned to work on one of the subject matter teams. There are four teams:

Vietnamese Language  
Mathematics  
General Science  
Social Science

The members of each team are responsible for the full development of materials and procedures for all of the topics within their subject area. At various times, however, the teams review what they have

done with members of the other teams and the advisors. Members of all teams participate in the initial brainstorming of ideas for approaches for the topics being taught. This has the advantage of allowing staff members to see approaches for a particular topic which may often be even more relevant for their own subject and topic.

#### Involvement of Teachers & Schools

Throughout the past year, teachers in various schools in Vietnam have been involved in the project and its development. For information about current teaching practices and problems, the research team observed classes at the Demonstration School of the Instructional Materials Centre (Saigon), Cho Quan School (Cholon), and Xuan Thoi Thuong School (village in Gia Dinh province). Experimental try-outs have been held at Cho Quan, Le Qui Don, and Tran Hung Dao schools, all in the Saigon area

Teachers from all of these schools, with the exception of Xuan Thoi Thuong, have from time to time been called upon to help in the project. In particular, for each part of the curriculum being used for the experiment, teachers have been called upon to describe present practices and problems, to clarify objectives, and to review the new materials being prepared.

Our meetings with the teachers has had the distinct advantage of closing the gap between what the guides and schedules say is supposed to be taught and what is actually taught. The teachers are able to tell us what is actually taught, how it is taught and exactly what the students are expected to do after the various topics have been covered. In many cases the teachers were able to give us some very good clues as to what types of approaches might be able to increase both the efficiency and the effectiveness. In some instances the teachers pointed out some of the obstacles which were preventing them from

teaching the materials faster and/or better. Several times we were able to brainstorm around solutions to the obstacles and come up with what, at least right now, look like reasonable approaches to the topics.

In part because of the help the teachers have been and because we feel that their continued involvement in our work is necessary we will be hiring eight teachers to work with INNOTECH on a part time basis. Four will work with us in the morning and four in the afternoon. They will continue to participate with us in the development of the procedures and materials. These teachers will do the actual classroom teaching of the materials during the tryout phase of the project. We feel that by helping us in the development of the procedures the teachers will be well qualified to teach the materials and also to give us some very good subjective evaluations of their effectiveness in the classrooms since they will know rather well what is expected of the materials.

## 2. Development of the Project

At the end of the experimental phase, we must have sufficient data to be able to decide how best to proceed in the development of the entire curriculum, and at what reductions in time this can be done. In order to be able to generalize from experimental results to the whole curriculum, the sections from the curriculum used in the tryout and experimental phases must be as representative of the whole curriculum as possible. The criteria used to insure representativeness of the selected units have already been presented in the description (page 7).

The first step in sampling for representative learning units was to study the entire primary school curriculum for Vietnam. This included studying texts and teachers' guides, as well as observing teaching in schools. A complete list of the contents taught in the five years of

primary school was then made. School schedules were also studied, so we would know the amount of time spent per lesson, and when each unit of content is taught during the school year.

Sampling proceeded by identifying different types of learning, and then assigning each unit of content to a slot, depending on which type(s) of learning will contain within each unit. After each unit had been thus assigned, units of about five hours of current instructional time were chosen according to the criteria outlined earlier in this report.

The twenty units thus chosen are:

VIETNAMESE LANGUAGE:

- 4th grade Reading Comprehension and Recitation
- 1st grade Writing and Reading
- 3rd grade Composition
- 2nd grade Dictation
- 3rd grade Vocabulary
- 4th grade Grammar
- 3rd grade Penmanship

GENERAL SCIENCE:

- 3rd grade Plants
- 2nd grade Food/Drink
- 1st grade Time
- 4th grade Transformation

MATHEMATICS :

- 3rd grade Metrics (Linear and Weight Measurement)
- 1st grade Addition and Subtraction
- 4th grade Fractions
- 2nd grade Geometry (Square and Parallelogram)
- 3rd grade Multiplication and Division

SOCIAL SCIENCE:

- 5th grade History (French Occupation)

- 2nd grade Morals (Duties Toward Others)
- 3rd grade Geography (Geography of Vietnam)
- 4th grade History (Le Loi)

As we have examined each of the topics more closely in developing instructional procedures for them we have often found that a single topic may contain more than one type of learning. We have also found that the list of topics selected contains some overlap of learning types. This is no real problem since we are most concerned with making sure that all of the types of learning found in the curriculum are represented, and there is no problem at all with a single type of learning being represented more than once.

### 3. Description of Procedures for Developing New Materials and Instructional Procedures

There are two approaches to reducing instructional time with the view to freeing the teacher to teach more students. The first is by increasing learning rate (ILR) so that students learn in less time than is currently needed. The other is by reducing student-teacher interaction time (RSTI), meaning that the amount of time spent by a teacher in front of a class to teach a lesson can be reduced. One constraint on these alternatives is that the total learning time for the students must not increase over what it currently is, i.e., the amount of in-class work plus homework must not increase.

In building new approaches to be tried out, both of these alternatives are being used. The approach which will finally be used in the experimental phase for each learning unit will depend on the degree of success during the try-out phase in reducing instructional time while still maintaining a high level of student performance.

The building of new approaches for all learning units has followed the same process. First, the team responsible for a particular topic has all related materials translated from Vietnamese into English. The materials, including texts and teachers' guides are then studied carefully. From the total five hour learning unit, a segment of approximately 1½ hours is selected for try-out. Next, two or more teachers are called in to discuss with the team what and how they actually teach, what problems they have, and how these problems might be solved. They also prepare draft post-tests for the selected lessons, to overcome the difficulty of frequent discrepancies between the text and the teachers' guide. These draft post-tests are used to help clarify the objectives of the lessons. The teachers are also asked for suggestions for increasing instructional efficiency.

Once these processes are completed, the team calls a brainstorming session, attended by all members of research staff. The team presents whatever information is needed to understand the objectives of the unit, the content, and problems existing or anticipated. The staff brainstorms on how to teach the unit effectively and on how to reduce instructional time significantly. All ideas are recorded, and later typed and distributed.

After the brainstorming, the team goes over the ideas generated, and uses them singly or in combination to develop four or more alternate methods of teaching the unit. The team then conducts a critique session attended by key staff members, including the research advisor and the project leader, to discuss the proposed methods, and finally decides on two to four approaches for try-out.

The team then proceeds to develop the instructional procedures and materials in English. All materials needed for each of the two to four new approaches, including instructional material, test material,

teachers instructions, experimental procedures, etc... are then designed. Finally, the materials which must be in Vietnamese are translated and produced in the required quantities.

#### 4. Progress to Date

To date, 26 new approaches have been developed for nine learning units. Two of these nine units were tried out in schools in Saigon near the completion of the 1973-74 school terms. One unit was grade IV Science and one unit was grade IV History. It is far too early to draw any conclusions from the results of the tryouts of these two units although we do feel some encouragement from the fact that we were able to see some reduction of teacher time, some reduction in the student learning time and some improvement in the achievement of the students. Perhaps the most important consequence of these initial tryouts is the fact that we were able to learn a number of things which we will be able to apply to subsequent tryouts.

The remainder of this section deals with a report of the tryouts already conducted and descriptions of the approaches which will be tried out during the 1974-1975 school year.

##### Report of Tryouts Already Conducted

###### 1. Grade IV History - The Le Dynasty

Briefly, in review, the three approaches tried out were (a) a Teaching Script presenting objectives, summary, questions, story, and again questions, in that order, (b) Programmed Instruction, the lesson being presented in small segments interspersed with questions, and (c) Programmed Comic Book like (b), but with the material presented in a comic book format.

All experimental groups were given an introductory lesson, followed by the three experimental lessons. Two control groups were used, and both were tested at the time that they normally would have been tested, i.e. at the beginning of the following history lesson. One of the control groups did not know they would be part of an experiment and were not told ahead of time that they would be tested. The other group was told before they were taught the lessons that they would be tested.

The results for time taken for the three approaches were quite different. The Teaching Script approach resulted in a significant reduction of time for presentation of the lesson (47% and 58% of the normal presentation time for boys and girls respectively). The homework exercise (flip cards) took slightly more time than the normal homework time, and the post-tests took almost exactly the same amount of time as they do currently. It is expected that with practice, the time spent on the homework procedure (flip-cards) which was new to the students, could also be reduced significantly.

Both of the self-instructional approaches (the Programmed Instruction and the Programmed Comic Book) took longer than the normal lesson presentation method. However, the teacher's presence was not required. Moreover, the ranges in times taken per student were very large. The times taken by the fastest student by class and lesson ranged from 27% to 83% of the normal class time. For the slowest student per class per lesson, the range was from 150% to 267%.

There were two major trends in the scores obtained on the post-tests. The children generally got their best score on the first lesson and their worst score on the third (last) one.

There is one reason for this, applicable only to the experimental groups, namely fatigue and response interference resulting from the high similarity of the material in the three lessons. Another reason, applicable to both experimental and control groups, was that the first lesson was the easiest, and the third was the most difficult. The first lesson was familiar to the students already from previous grades. The second was not, and the third was not only unfamiliar, but very abstract and complicated.

The second trend in the scores was that the experimental groups almost always did better than the control groups. For lesson 1, the control group mean was 53% as compared with means ranging from 84% to 90% for the three experimental groups. For lesson 2, the control groups had means of 42% and 46% as compared with the mean for the Teaching Script group of 80%. For lesson 3, the Teaching Script group did about the same as the Control group (35%), while the Programmed Instruction group did better (52%) and the Programmed Comic Book group did worse (19%).

Table 1  
Mean Percentage Scores by Treatment by Lesson  
(Grade IV History)

Treatment	Lesson		
	1	2	3
	%	%	%
Control I	53	42	35
Control II	*	46	*
Teaching Script group	90	80	34
Programmed Instruction group	87	(67) <sup>1</sup>	52
Programmed Comic Book group	84	(68) <sup>1</sup>	(19) <sup>2</sup>

1. Boys only
2. Girls only
- \* Not tested

All other scores were obtained from 1 boys' and 1 girls' class.

As was mentioned earlier, the greatest success of this tryout was the results not in terms of time reduction and maintenance of student performance, but in terms of the experience it gave the research team for future work. We learned that the idea of presenting several lessons in sequence in the time normally required for one did not work, because the students were being required to learn more highly similar material, and the more they learned, the more response interference occurred. This idea of combining lessons does not appear to work for the memorization of similar facts. It may very well work for certain other kinds of learning where memorization plays a less important role e.g., problem solving types of learning.

Part of our difficulty in this tryout was due to our use of procedures not yet familiar to the students. More attention needs to be given to the familiarization process. Our one introductory lesson was not sufficient, especially as it was so quickly followed by the experiment itself.

In subsequent tryouts we plan to let the students practice the new procedures one or two days before the actual tryout. The practice will be "fun" and not try to teach any content but simply allow the students to become familiar with the new procedures. We will also teach only one lesson at a time whenever lengthy memorization is required.

## 2. Grade IV Science - Transformation (Evaporation)

Four approaches were developed for this unit: (a) Linear Program using group instruction, (b) Linear Program using self-instruction, (c) cartoon using group instruction, and (d) cartoon using self-instruction. The tryout of these approaches benefited from the previous History tryout. We were able to learn some things from our work in History which we applied to the Science tryout.

Instead of trying to teach three or four lessons in one sitting for the students we tried to teach only one lesson in as short a time as possible. The results of the science approaches was much more encouraging than the history tryout.

The Linear Programs which were used for both group and self-instruction were exactly the same although the uses were different. The cartoons for both group and self-instruction were also the same. This gave us a chance to compare group and self-instructional formats in terms of increased student learning rates and also student achievement. We knew from the start that the self-instructional programs would most significantly reduce the student/teacher interaction time.

The Linear Program approach relied primarily on the use of cues. In the group instruction format the teacher read the sentence and left out the information to be filled in the blank. The students then said the information aloud and in unison. They then all turned the page and said the correct answer which appeared on the next page. They continued this way until they completed the booklet. In the self-instructional approach, the students filled in the blanks, checked their answers, corrected them if necessary, and continued through the booklet until they finished it. The cartoons were illustrations of some of the instances and experiments related to the evaporation of water. There were questions about the pictures underneath them. In the group approach the teacher read the questions and the students answered them aloud and in unison. They then all turned the page and said the correct answer. In the self-instructional approach the students read the questions to themselves, wrote in the answers, checked and, if necessary, corrected them and then continued until they completed the program.

The Table below summarizes the results of the Science tryouts:

Table 2  
Percent Time Reduction and Mean Achievement Scores  
(Grade IV Science)

Approach	Number of Students	% Time Reduction	Mean Post-test Score (%)
I. Linear Program (Group)	92	40	80
II. Linear Program (Self-Instruction)	98	54	79
III. Cartoons (Group)	95	33	76
IV. Cartoons (Self-Instruction)	93	40	82
Control	102	0	47

The mean post-test score for the science unit for the control group was about the same as the scores for the control groups for the history unit -- about 50%. The mean achievement scores for all of the approaches used were about the same -- 80%. This seems to indicate a fairly high degree of mastery for the groups and seems to be a good target for future approaches to aim at. There is somewhat more variance among the approaches with regard to the time reduction, although even these differences may not really be significant and could probably be made even smaller with some slight modifications in the programs. At any rate the most impressive approach is the self-instructional linear program. In both instances the students using the self-instructional approaches did a little better, in terms of learning rate, than the students using the group instruction. Although the differences are small the effect of these self-instructional approaches becomes more

impressive when we look at the amount of student/teacher time that they are able to reduce. The amount of teacher time required is almost zero. Far from conclusive as the results of these tryouts may be, they are certainly encouraging with regard to the possible potential of the self-instructional approaches in terms of increasing learning rate, reducing student/teacher interaction and also raising student achievement.

Although we are looking for the best approaches during the tryouts, we know that variety is necessary in order to stimulate and maintain student interest and enthusiasm. From this point of view it is important to note that all of the approaches tried out to date have significantly improved achievement and all were able to increase learning rates. As RIT eventually moves into its full implementation phase we may need to use a variety of approaches. Knowing that several different approaches can meet the objectives of the RIT project will allow us to use these several different approaches and not only meet our objectives but also provide the students with variety in their learning situations.

#### Descriptions of Approaches Developed to Date

##### Vietnamese Language

##### Reading Comprehension and Oral Reading

(Grade IV)

##### ... Peer Programmed Teaching

Five student leaders are selected by the teacher on the basis of demonstrated reading skills and leadership qualities. Each one is assigned to supervise about 10 of his fellow students. A script will be written for each student leader. It will contain what he is to say and to do. First, he or she will explain the purpose of the lesson and what activities the students will be expected to

perform. The student leader then presents the lesson by controlling a tape recorder. The student leader will turn the machine on and at directions from the tape will also turn it off. The tape will present pronunciation of words and also correctly read phrases and sentences. The students will repeat the words, phrases and sentences with the tape and will then be called on one at a time to say them to the student leader who will tell them when they are right and will give them the correct pronunciation when they are wrong. The student leader will not tell the students that they are wrong but will simply say the words or phrases or sentences correctly and ask the student to repeat them that way. We will avoid having the student leader give any of the students any negative reinforcement.

... Self-Instructional Program

Short segments of a story will be presented to the students. The segments will be followed by questions related to the story. The students will be expected to read the story, answer the questions, check their answers and correct them, if necessary. The students continue these procedures until they complete the booklet. At the end of the booklet the students take a test on the whole story. They also check and correct this test by themselves.

... Flip Cards

A small portion of a story, plus comprehension questions are written on one side of a card. The answers to the questions are on the other side. Each student works by himself, reading the story segment, answering the questions, and then checking his answers. The student goes through the cards until he can answer every question correctly.

Mathematics1. Linear Measurement

(Grade III)

... Teacher Directed Practice

The teacher explains the purpose of the lesson, demonstrates actual measurement with a meter stick, and then demonstrates various methods for estimating lengths without using a meter stick. She then supervises the children as they measure various items in the classroom.

... Student Directed Practice

Student leaders work with about ten students each, explaining the lesson, demonstrating measurement and estimation, and supervising the students as they practise measurement and estimation.

... Linear Programme

Cueing and fading are being used in a self-instructional linear programme. The students complete the programme, filling in responses, and checking their responses against the feedback given.

2. Geometry

(Grade III)

... Linear Programme

This is a self-instructional linear programme in which the students give answers to questions or fill in missing information. Feedback is given and cueing and fading are used.

... Mathematics Laboratory

This approach consists of a tape, plus objects for the students to manipulate. In a large class or in smaller groups, the students listen to the tape and follow the instructions it gives. After the group tape-directed activities, the students carry out an exercise individually, not directed by the tape.

General Science1. Food and Drink

(Grade II)

... Cartoon

The material is presented as an illustrated story, with questions and feedback interspersed. The student reads the story, and on coming to the questions, tries to answer them. He then checks his answers for correctness. If correct, he continues on to the next section of the story, if incorrect, he corrects his answer and then continues.

... Linear Programme

In this approach, the content is presented in an illustrated linear programme which uses cueing. The student works through the story on his own.

2. Anatomy and Uses of Parts of Plants

(Grade III)

... Illustrated Linear Programme

Pictures are presented of various types of stems, their parts and some of their uses. The students answer questions associated with the pictures, and check their own answers.

... Flip Cards Using "Buddy System"

The students use flip cards with questions, and sometimes pictures on one side, and answers on the other. Students work in pairs, one answering the questions and the other providing feed-back.

... Answer Hunting

Students are given questions plus suggestions for ways to find the answers. They have to find the answers for themselves, by going to the library, by asking any resource people available (from older siblings to experts), or by investigating actual

stems for themselves. The students come back to class to obtain feedback after finishing the assignment.

### 3. Transformation

(Grade IV)

#### ... Teacher Directed Linear Programme

The teacher reads the programme out loud, and the students respond out loud as a group. They check their answers and then repeat the correct response.

#### ... Self Instructional Linear Programme

The students use the same programme as in the Teacher Directed Linear Programme above, but work through it by themselves.

#### ... Teacher Directed Comic Book

The teacher asks the questions presented about each illustration, and the class answers out loud. They check their answers and then repeat the correct answer.

#### ... Self Instructional Comic Book

Using the same comic book as in the Teacher Directed Comic Book, the student looks at the pictures, and tries to answer the questions. He then checks to see if his answers are correct, and if not, corrects them. He then continues through the rest of the programme in the same way.

### Social Science

#### 1. History - The Lê Dynasty

(Grade IV)

#### ... Teaching Script

This is similar to the current method of teaching except that objectives are given at the beginning, and the sequence is from more general to more specific information, a reversal of the

current sequence. The teacher reads out loud, and the students read along silently. They read the purpose of the lesson, the summary, the questions to be answered, and the lesson. They then try to answer the questions. For homework, the students use flip cards with questions on one side and answers on the other. They work by themselves going through the flip cards until they are able to complete them with no errors. The procedure they use for this is to put the cards they can answer in one pile and the ones they cannot in another pile. The objective is to get all of the cards in the correctly answered pile.

... Programmed Instruction

The lesson is presented in small segments, interspersed with questions on each of the segments. Students read through the lesson on their own, answering the questions as they come to them, checking their answers, and correcting them if necessary. After completing the lesson they immediately take a post-test.

... Programmed Comic Book

This uses the same content as in the Programmed Instruction above, except that it is all presented in cartoon form.

2. History - The French Occupation of Vietnam

(Grade V)

... Summary Chart

The students are given a partially completed summary chart to use with their text. They read the lesson in the text, complete the summary chart, and then memorize the summary chart for homework.

... Text Plus Questions

The student reads the lesson in the text, answers questions on it, and then checks his answers.

... Linear Programme

The students work through a linear programme which uses both cueing and fading.

... Students Write Questions

The students write their own set of questions and answers from the text, following guidelines laid down for them on what kinds of questions to ask, and how many. In class, they divide up into small groups for a contest in which they earn points for correctly answering their own and each others' questions.

3. Morals - Duties Toward Others  
(Grade II)

... Cartoon Presentation

Situations related to the morals lesson will be presented in cartoon form. After each situation, three alternate behaviors will be presented, from which the student must choose the one he thinks best. Feedback will be given after each choice. At the end of the lesson, the moral will be presented again in multiple choice form for the children to choose the best answer.

... Cartoons Plus Taped Plan

This approach is the same as the Cartoon Presentation above, except that the cartoons will not have any words. They will simply be illustrations for the taped presentation of the situations. Again the students will have to choose the best of three alternative behaviors.

Work on the other eleven learning units should be completed by the end of September 1974.

In addition to the types of approaches which are described here, the staff has been discussing some additional types which they are now in the process of developing further. We are now developing songs, and limericks especially when we need fairly good mnemonic devices. We are contacting some lyricists to help us in the preparation of these types of materials. We are also beginning to develop branching

programs. One of the advantages of the branching programs is the fact that those students who already have some of the skills being taught do not need to go through materials which they have already mastered. As we proceed further into our work we are finding that a number of the things which are being taught may indeed already be mastered by most, if not all, of the students. We will be conducting some pre-tests to find out if our suspicions are correct. Obviously, one of the easiest ways to save time is not to teach the subject at all. This is not only possible, but also desirable, if the students already possess the skills and/or information.

**APPENDIX**

**SAMPLE RIT MATERIALS**

On the following pages are some samples of materials which have been developed by the RIT staff. All of the materials are used in the Vietnamese language. We have included brief explanations in English of each of the approaches.

\* \* \* \* \*

The following three pages are excerpts from one of the Vietnamese history lessons. The pictures show the Chinese King sending two of his generals to put down the Vietnamese. Le Loi defeats the Chinese generals and ends the ten year war between China and Vietnam. Le Loi then becomes King of Vietnam. The material is for Grade IV. The procedure used is for the students to read the story and then answer the questions which the teacher asks her children, (on the last of the three pages included here). The students then check each others' work and the teacher records the scores.



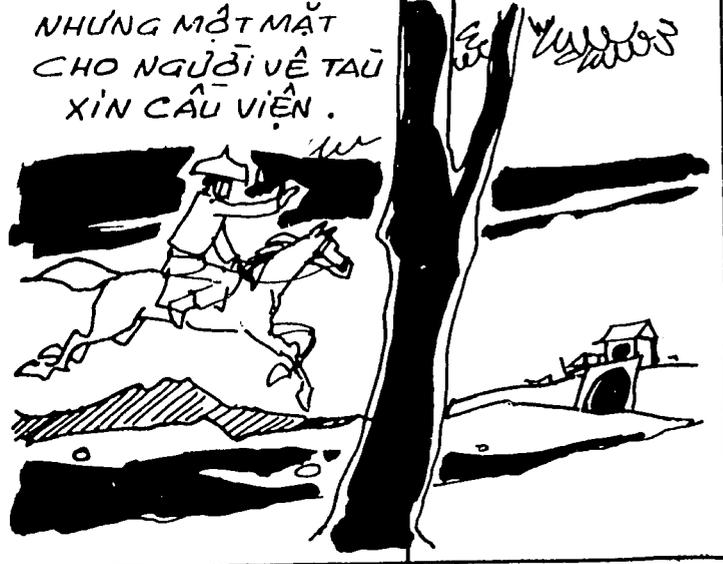
ĐƯỢC TIN, NHÀ MINH SAI  
TƯỚNG VƯƠNG-THÔNG  
ĐEM QUÂN TIẾP VIỆN.



VƯƠNG-THÔNG BỊ BẠI  
Ở TUYÊN-ĐÔNG, CHẠY VỀ  
ĐÔNG-ĐỒ KHÔNG DÁM  
RA ĐÁNH NỮA.



VƯƠNG-THÔNG XIN CẦU  
HOA...



NHƯNG MỘT MẶT  
CHO NGƯỜI VỀ TÀU  
XIN CẦU VIỆN.

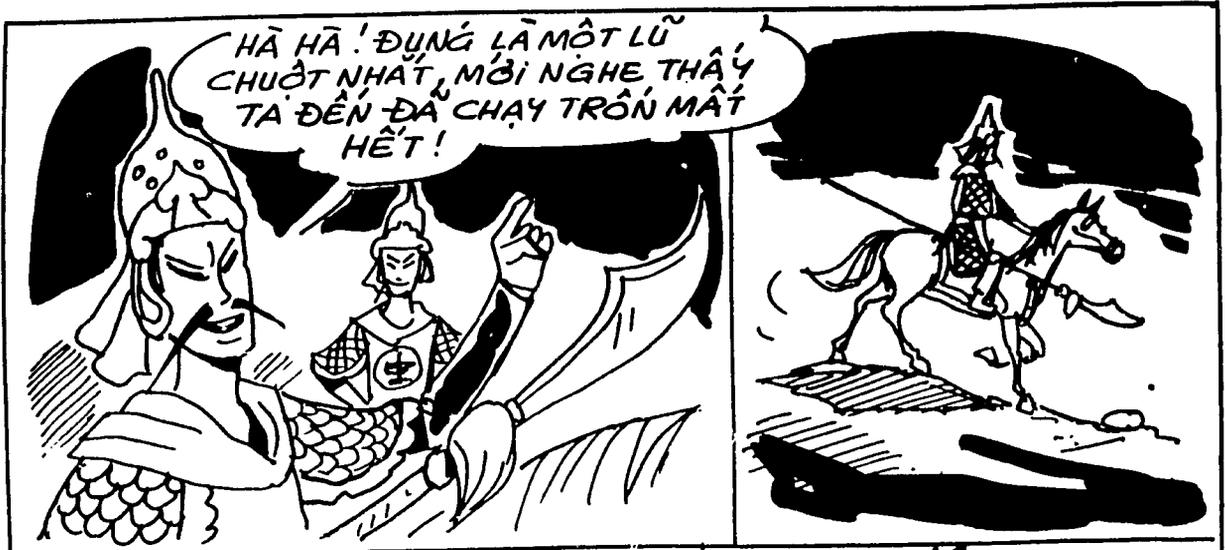


VUA MINH KINH HÃI VỘI CHO  
VỢ LIỄU-THANG VÀ MỘC-THẠCH ĐẾN.

TÀU BÈ-HẠ SA,  
GÌ BONG GIÁC CỎ,  
CHUNG THÂN NGUYÊN  
ĐEM ĐÁU LÊ-LỢI VỀ  
DANG BÈ-HẠ!



ĐOÀN QUÂN VIỆN -  
CHINH TIẾN VỀ MIỀN  
NAM, CHƯA BIẾT RANG  
NGAY TÀN CỦA CHÚNG ĐÃ ĐẾN. 8



HÀ HÀ ! ĐỪNG LÀ MỘT LŨ  
CHUỘT NHÁT, MỖI NGHE THẤY  
TA ĐẾN ĐÃ CHẠY TRỐN MẤT  
HẾT !



TIẾNG TRÔNG BÔNG,  
VANG DÂY. BỐN PHÍA,  
QUÂN NAM LÃ RA NHƯ  
NƯỚC VỖ BỜ.



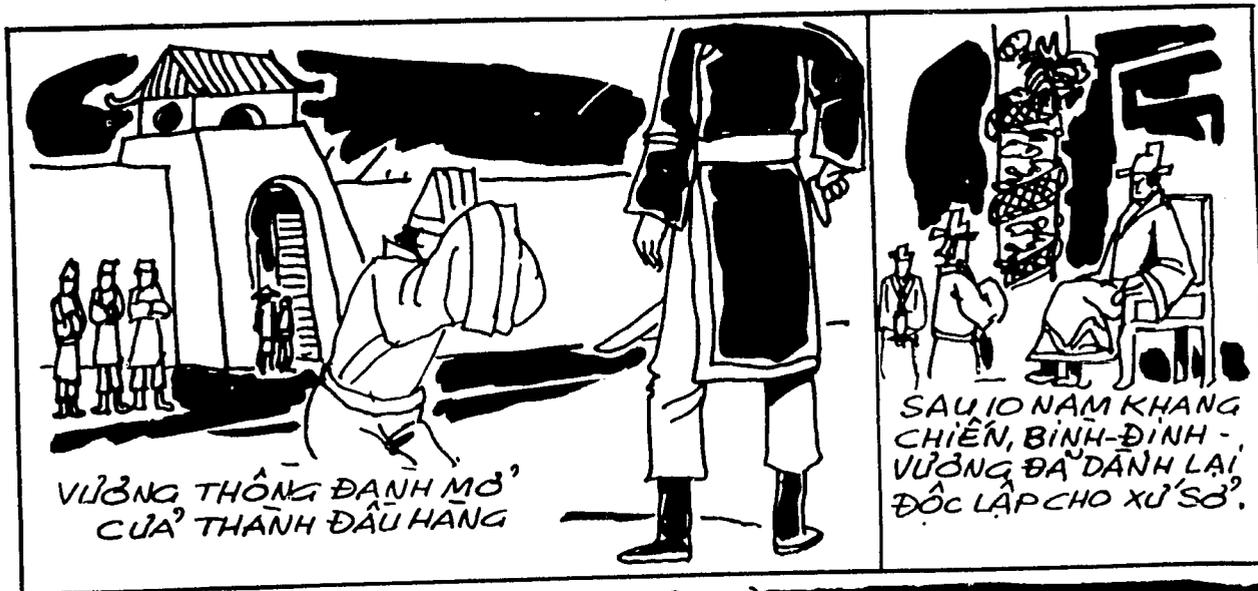
HỎI QUÂN SĨ !  
ĐÂY LÀ TRẬN  
QUYẾT ĐỊNH !  
SỰ THANG BẠI !  
HÃY CỐ GẮNG  
LÊN !



LIỄU THẮNG CHÔNG TRẢ MÃNH  
LIỆT, CUỐI CÙNG BỊ QUÂN TA  
GIẾT Ở CHI-LĂNG..

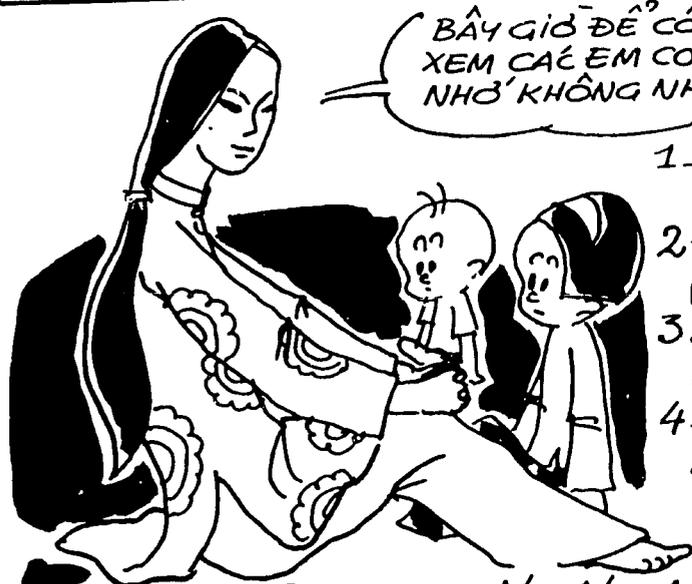


... CÕN MỘC-THẠCH  
CHẠY TRỐN VỀ TÀU.



VƯƠNG THÔNG ĐÁNH MỞ  
CỬA THÀNH ĐẦU HÀNG

SAU 10 NĂM KHANG  
CHIẾN, BÌNH-ĐÌNH-  
VƯƠNG ĐÃ ĐÁNH LẠI  
ĐỘC LẬP CHO XỨ SỞ.



BÂY GIỜ ĐỂ CÔ  
XEM CÁC EM CON,  
NHỚ KHÔNG NHÉ!

- 1- BÌNH-ĐÌNH-VƯƠNG TIÊN QUÂN RA BẮC HỒI NĂM NÀO ?
- 2- NHÀ MINH ĐÃ SAI AI ĐEM VIÊN-BÌNH TỚI TUY-ĐÔNG ?
- 3- NHÀ MINH ĐÃ SAI AI SANG GIÚP Ở TRẦN CHI-LĂNG ?
- 4- LÊ-LỢI ĐÃ CHỐNG VỚI QUÂN MINH TRONG THỜI GIAN BAO LÂU ?

- 5- SAU THỜI GIAN CHIẾN ĐẤU LÊ-LỢI ĐÃ LÀM ĐƯỢC GÌ CHO ĐẤT NƯỚC ?
- 6- HAY KỂ RA HAI ĐỨC TÍNH TỐT CỦA LÊ-LỢI ?



LÊ-LỢI BỊ THUAN HIẾU, TRẦN ĐÁU CÓ KHỐC NHỬ EM VẬY ĐẤU!

The following three pages are extracted from a linear program in fourth grade science. The topic is evaporation. The students write in the answers and then turn the page to check their work. If they are incorrect they change their answer, if they are right they continue through the program. Thematic prompts are used in this program. During the tryout of these materials the teacher read the materials and the students answered out loud in one approach and in another approach the students went through the program by themselves.

## Khoa Học - Lớp 4

## SỰ BỐC HƠI

Bát Đâu	1. Khi nước được đun nóng, nó bốc hơi. Hiện vật có hình thể giống như khói mà em thấy bốc lên từ mặt _____ nóng ấy gọi là hơi nước.
Bốc Hơi	6. Nếu quần áo ướt được phơi ngoài nắng suốt ngày, nó sẽ được khô vì sức nóng của mặt trời làm cho nước trong quần áo _____.
Châm	11. Các ví dụ vừa kể trên cho ta thấy rằng có một sự bốc hơi mà mắt ta không _____ rõ. Ta gọi đó là sự bay hơi.
Bốc Hơi Ngưng Hơi	16. Để quên quần áo khô ngoài trời suốt đêm, sáng hôm sau quần áo ấy không còn khô nữa, mà lại trở thành _____ vì sương xuống.
Ngưng Hơi	21. Đôi khi nước bị hoà chung với các chất khác. Muốn lấy được nước tinh khiết, trước hết ta làm cho nước bốc hơi và kê đó làm cho hơi nước lạnh lại thì nó sẽ _____.

Nước	2. Em cũng có thể thấy _____ bốc lên từ mặt một bát phở nóng, hoặc một tách trà hay cà phê nóng.
Bốc Hơi	7. Cũng một cách ấy mà bát đĩa khi rửa xong đem ra ngoài phơi, một chốc nó sẽ _____ đi.
Trông Thấy	12. Sự _____ lúc nào cũng có ở chung quanh ta. Buổi sáng, sương đọng trên lá, trưa thì tan hết. Vùng nước mưa đọng trên đường, dần dần cũng khô đi.
Ướt (y-y) (âm ướt)	17. Sương chính là những hạt bụi nước li-ti tạo ra bởi hơi nước. Trong không khí gặp lạnh và _____ lại.
Ngưng Hơi	22. Cũng một phương pháp này ta cũng có thể cất được nước hoa nữa. Trước hết ta làm cho chất nước hoa tinh khiết bốc hơi ra khỏi các chất khác chứa trong nước hoa, kế đó ta làm cho chất _____ tinh khiết này lạnh lại và ngưng hơi.

Hơi Nước	3. Một ấm nước bắt trên bếp lửa, nước được đun nóng và một lúc sau thì sôi. Đôi khi hơi nước _____ từ mặt nước đang sôi làm cho nắp ấm bị đẩy lên.
Khô	8. Ta có thể lấy muối trong nước mặn ra, bằng cách đun nóng nước mặn ấy, để chất nước trong đó _____.
Bay Hơi	13. Không những nước có thể trở thành hơi nước như các ví dụ vừa kể trên mà hơi nước cũng có thể trở thành _____.
Ngưng Đọng	18. Hơi nước trong không khí gặp lạnh ngưng đọng lại thành mây. Các cụm _____ đen này gặp gió lạnh thì sẽ thành mưa.
Nước Hoa	23. Ngoài nước _____ và nước hoa ra, có những chất khác như rượu cũng có thể cất ra bằng cách áp dụng phương pháp này.

The next three pages are taken from a fourth grade science program on rust. The illustrations are each followed by questions which are based on the pictures. The students check their own work on another sheet of paper. When they complete all of the pages in the illustrated booklet they then take a post-test on all of the materials which were covered. This program was also tried out using the teacher to read the questions with the students answering out loud and also as a self-instructional program.

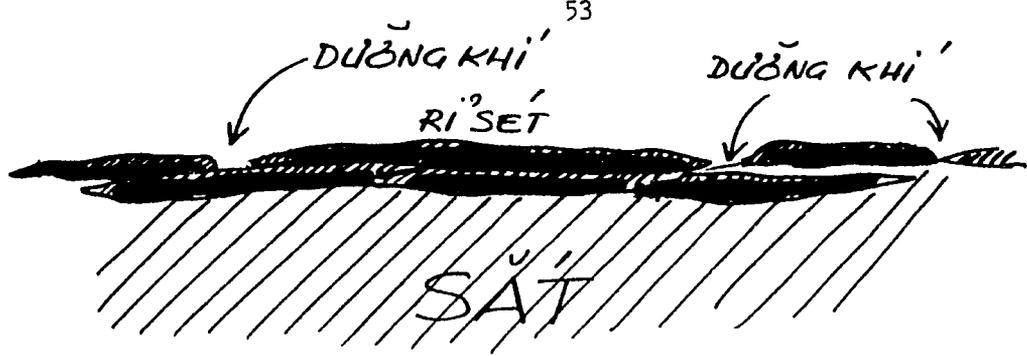
# Sự Sét Ri



1] ĐỂ MỘT HỘP SẮT, CÁI ĐINH SẮT NGOÀI KHÔNG KHÍ ÍT LÂU, EM THẤY GÌ BAO CHUNG QUANH NHỮNG VẬT ẤY?  
NHƯ VẬY, CÁC VẬT NÀY ĐANG BỊ GÌ ĐÂY ?



2] NHÌN CÁI ĐINH BỊ SÉT RI, EM THẤY GÌ ?



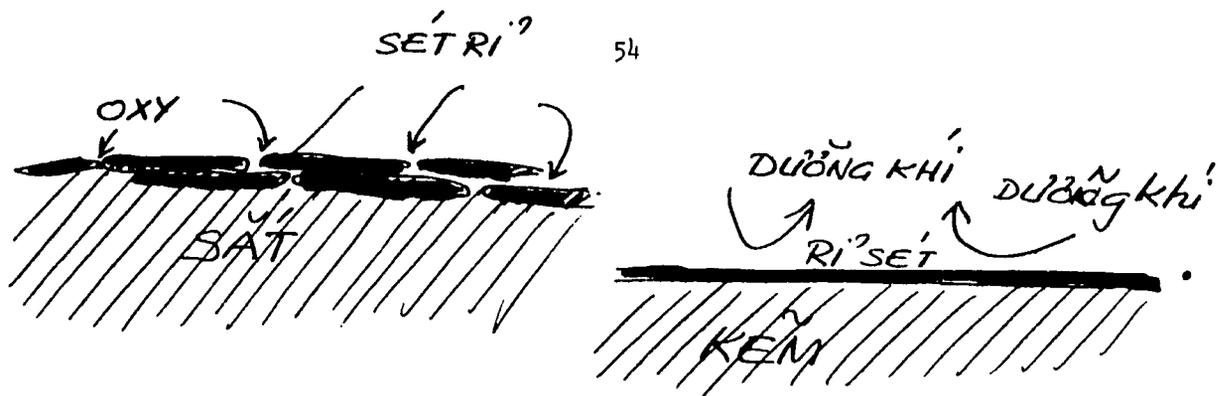
3] RỈ SẮT CÓ TÍNH CÁCH ĐẶC BIỆT NÀO ?



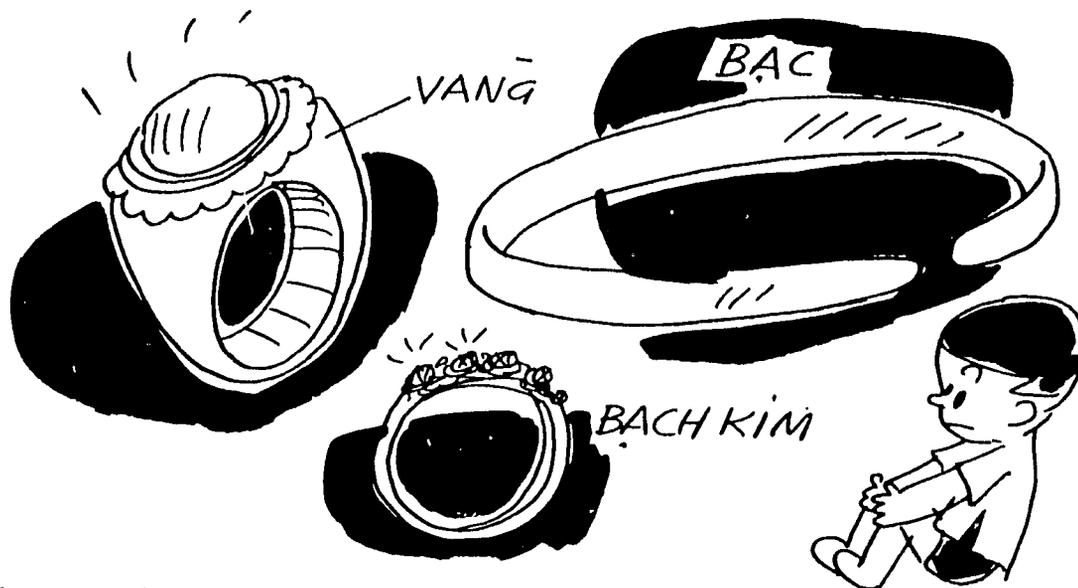
4] NẾU ĐỂ CÂY ĐÌNH ĐÃ BỊ SÉT RỈ NGOÀI TRỜI LÂU HƠN NỬA THÌ NÓ SẼ RA SAO ?



5] KIM LOẠI KHÁC NHƯ KEM (ÔNG MÀNG NƯỚC VÀ THIẾC CỎ) BỊ SÉT RỈ KHÔNG ?



SÉT RI' CỦA KẼM KHÁC SÉT RI' CỦA SẮT Ở ĐIỂM NÀO ?



[6] CÓ NHỮNG KIM LOẠI NÀO KHÔNG BỊ SÉT RI' ?

