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SEAMEO REGIONAL CENTER FOR EDUCATIONAL INNOVATION AND TECHNOLOGY

self-instructional MODULES

volume 2: modules 16-31

THREE-MONTH TRAINING PROGRAM
JANUARY 6-APRIL 5, 1975

SERIES 5

MODULE 16

FORMULATING EDUCATIONAL PROBLEMS:

A SELF-INSTRUCTIONAL MATHETICS PROGRAM

INNOTECH

MODULE 16

PREVIEW

Module 16 is a self-instructional mathetics program designed to teach you how to formulate educational problems in an effective manner. Because formulating problems is the foundation upon which the systems approach to educational planning is based, it is critical that you learn develop this skill at this point in your training programme.

OBJECTIVES

After completing the mathetics program, you will be able to formulate educational problems which:

(1) focus upon the real problem

(2) do not restrict or limit possible solutions to solve the problem

(3) describe the consequences which might result if the problem is not solved

CORE INSTRUCTIONAL ACTIVITIES

Proceed to FRAME 1 and follow the directions.

FRAME 1

PREVIEW - NO RESPONSE REQUIRED

This is a "Mathetics Exercise", one type of programmed instruction used at INNOTECH to permit students to learn concepts at their own rate without the use of a lecturer.

The purpose of this particular Mathetics Self-Instructional Programme is to teach you how to formulate educational problems in an effective manner. Since good problem statements are the foundation upon which the systems approach is built, it is essential that you learn how to state educational problems correctly.

DIRECTIONS

As you proceed through each frame, make certain that you

(a) answer each question in writing

(b) cover the FEEDBACK (our suggested correct answer) while you are responding

(c) compare your written response to our suggested answer

GO ON TO FRAME 2

FRAME 2

Use the following criteria to evaluate statements of educational problems:

I. The statement must focus upon the real problem.

Example:

When a farmer says "I wish it would rain", his statement does not focus on the real problem. His real problem is "I don't have enough water for my rice fields."

Practice Exercise:

When a man says, "I need a pill for my headache", he has not stated his real problem. His real problem is: (check your choice)

( ) a. He cannot get pills without a prescription.

( ) b. He needs to see the local doctor.

( ) c. He has a pain in his head.

FEEDBACK

(✓) c. He has a pain in his head.

FRAME 3

II. The statement must not restrict or limit the number of possible solutions to solve the problem.

Example:

The farmer's statement "I wish it would rain" restricts the farmer to the solution of "wishing for rain" and excludes other potential solutions like an irrigation system or artificial rain.

Practice Exercise:

When the man says "I need a pill for my headache", he has restricted himself to one alternative to solve his problem. In so doing, he excludes other alternatives such as:

( ) a. Going to see a doctor.

( ) b. Lying down for an hour.

( ) c. Buying a pair of glasses.

FEEDBACK

(V) a. Going to a doctor

(V) b. Lying down for an hour

(V) c. Buying a pair of glasses

All of the alternatives (a, b, and c) are possible solutions to the problem... plus many others.

FRAME 4

A good problem statement focuses upon the real problem (i.e., usually the learner) and does not limit the problem solver to one alternative (i.e., usually a method or instruction, the use of teachers, etc.) to solve the problem.

Educational Example 1:

"There are not enough modern mathematics textbooks in primary schools" is an example of a poorly stated educational problem. It does not focus on the real problem,and it limits the problem solver to the "textbook" solution (i.e., a method of instruction). The real problem probably is "Children in primary schools are not learning enough mathematics".

Educational Example 2:

"Many children are not able to read and understand local newspapers when they leave primary school" is an example of a good problem statement. It focuses on the real problem (i.e., children not learning) and does not limit the number of possible alternatives to solve the problem. The problem solver can generate many alternatives to solve the reading problem (e.g., programmed instruction, peer tutoring, etc.)

Educational Example 3:

"There is a critical shortage of reading specialists to help children who have reading difficulties" is an example of a poorly stated problem. It does not focus on the real problem and it limits the problem solver to "using reading specialists to help children learn to read" (i.e., use of teachers) as the one solution to the problem. It must be rewritten to stress the real problem: "Many children are having reading difficulties".

Circle the appropriate letter under each Problem Statement. The letters refer to the criteria in the right-hand column.

Problem Statements	Criteria
(1) We do not have enough language laboratories in our primary schools a b c	(a) A good statement because it focuses on the real problem and does not limit the number of alternative solutions.
(2) We need to hire more trained remedial reading teachers a b c	(b) A poor statement because it does not focus on the real problem and restricts the problem solver to one method of instruction as the single solution to the problem.
(3) Many children are not learning science a b c	(c) A poor statement because it does not focus on the real problem and restricts the problem solver to the use of teachers as the single solution to the problem.

FEEDBACK

(1) We do not have enough language laboratories in our primary schools

a (b) c

(2) We need to hire more trained remedial reading teachers

a b (c)

(3) Many children are not learning science

(a) b c

FRAME 5

What <u>two</u> criteria should you use to evaluate problem statements?

(1) The statement must focus on _____.

(2) The statement must not limit the number of _____
_____.

FEEDBACK

(1) The statement must focus on the real problem.

(2) The statement must not limit the number of alternative solutions to the problem.

FRAME 6

Rewrite the following three poorly-stated problem statements so that they focus on the real learning problem:

(1) "We need to develop a closed circuit television system to teach larger numbers of urban children to read."

(2) "There are not enough mathematics teachers who are willing to work in rural areas."

(3) "There are not enough buses to transport rural children to schools."

TURN THE PAGE FOR FEEDBACK

FEEDBACK

(1) "Not enough urban children are able to read" (or equivalent response which omits the closed circuit television method of instruction as the single solution to the problem).

(2) "Not enough rural children are learning mathematics" (or equivalent response which omits the hiring of teachers as the one solution to the problem).

(3) "Rural children are unable to obtain ar education". (omitting busses as the only way to get to school

and

omitting schools as the only way to get an education)

FRAME 7

From Frame 1 to 6, you learned that a well-formulated problem statement focuses upon the real problem and does not restrict the number of possible solutions to solve the problem.

From Frame 7 to 9, you will learn that a well-formulated problem statement must also clearly describe the consequences which might result if the problem is not solved.

Example:

The farmer's real problem was stated as "I don't have enough water for my rice fields." If his problem is not solved, the following consequences might result:

without water, the rice crops will die and the farmer will not be able to feed his family (or earn a living)

Practice Exercise:

The real problem of the man with the headache was "the pain in his head." If his problem is not solved, what consequences might result?

_____

_____

_____

_____

FEEDBACK

Your answer should discuss consequences like these:

"The pain might become so severe that the man has to stay away from work; without work, he will not be able to support himself (or his family)." etc. etc.

FRAME 8

The real problem: "Children in primary schools are not learning mathematics"

CONSEQUENCE

Consequences of the problem not being solved: "If children do not learn mathematics, then they will not be able to count money, use measuring instruments, or go on to higher mathematical and scientific knowledge in a growing technological world"

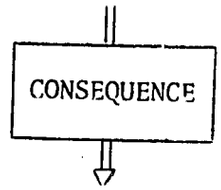
The real problem: "Not enough children are able to read and understand newspapers when they leave primary school"

CONSEQUENCE

Consequences of the problem not being solved: "If children do not learn to read and understand newspapers, then they will not be informed about what is happening in their country, will not be able to vote intelligently and will perpetuate illiteracy"

Practice Exercise:

The real problem: "Not enough learning opportunities are provided for rural children who are not in school"



(Please write some possible consequences below.)

Consequence of the problem not being solved: "If rural children do not attend school, then"

_____

_____

_____

_____

_____

_____

_____

_____

FEEDBACK

Possible consequences:

... not learn basic reading, writing, and arithmetic skills

... become illiterate and unable to function in the adult community

... bring-up their children the same way

... be very limited outside of their villages

FRAME 9

A well-formulated problem statement must:

(1) Focus on _____.

(2) Not limit _____.

(3) State the _____ if the problem is not solved.

FEEDBACK

(1) Focus on the real problem.

(2) Not limit the number of alternative solutions.

(3) State the consequences if the problem is not solved.

FRAME 10 (OPTIONAL)

Supplementary Practice Exercises

Instructions:

Step 1. Look through the list of problems.

Step 2. Write "P" in front of the statement that you think is a real problem.

___ 1. Secondary students do not know enough about modern science.

___ 2. Science teachers are poorly trained. They need in-service courses.

___ 3. Our textbooks are out-of-date. They must be revised.

___ 4. Many children are not getting an education.

___ 5. We do not have enough schools.

___ 6. Parents need financial aid to enable them to send their children to schools.

___ 7. We need a radio-TV system to educate the children who are not at school.

___ 8. There are not enough buses to take children to school. We need more buses.

___ 9. Children in rural schools do not learn as much as children in urban schools.

___ 10. The teachers in rural schools are very poorly trained. They must be trained.

___ 11. We should have some more charts, wall maps and teaching aids for our classes in rural schools.

___ 12. Children do not have enough food. This is the reason they are not learning.

___ 13. We do not have language labs in our schools. We need them.

___ 14. 80% of children in secondary schools do not know a second language well enough to read textbooks in the language.

___ 15. Our teachers are not trained to teach a second language.

___ 16. We need to offer math courses in the second language; students will then use it more often.

___ 17. There are no libraries in the primary schools.

___ 18. There are not enough reading textbooks for all children in rural schools.

___ 19. Our reading curriculum does not teach reading in the modern way.

___ 20. We need to develop a programmed instruction course in reading and start a TV series on reading.

___ 21. Many children are not able to read and understand newspapers when they leave primary school.

FEEDBACK

Only 1, 4, 9, 14 and 21 are real problems.

FRAME 11

Decide whether the following three statements are

good problem statements

or

average problem statements

or

poor problem statements

Check ☐ the appropriate box.

If you decide they are "poor statements, rewrite them to state the real problem.

1. "Too many children drop out of school before the end of their primary education"

☐ good

☐ average

☐ poor

Rewrite (if you checked "poor"):

_____

_____

_____

2. "There are not enough qualified mathematics teachers in Southeast Asia"

☐ good

☐ average

☐ poor

Rewrite (if you checked "poor"):

_____

_____

_____

3. "Radio broadcasting should be used to help rural children gain a sense of national pride"

☐ good

☐ average

☐ poor

Rewrite (if you checked "poor"):

_____

_____

_____

FEEDBACK

1. "Too many children drop out of school before the end of their primary education"

   ☐ good

   ☑ average

   ☐ poor

   Rewrite: "Too many children do not complete a primary education." (Note that the solution of "schools" is left out.)

2. "There are not enough qualified teachers in Southeast Asia."

   ☐ good

   ☐ average

   ☑ poor

   Rewrite: "Not enough children in Southeast Asia are receiving a quality education" -- (or other statements which leave out the solution of "teachers.")

3. "Radio broadcasting should be used to help rural children gain a sense of national pride."

- [ ] good
- [ ] average
- [x] poor

Rewrite: "Rural children do not have a sense of national pride."

FRAME 12

Demonstrate your ability to formulate educational problems effectively by completing Problem Statements 1 and 2:

1. Problem Statement

Real Problem: "Not enough secondary students are learning science skills"
and
Consequence: "_____

2. Problem Statement

Real Problem: "Rural children do not have a sense of national pride"
and
Consequence: "_____

FEEDBACK

1. Real Problem: "Not enough secondary students are learning science skills."

   Consequences Possible consequences are:

   ... they will be unable to continue science education in universities (and the country may then have too few scientists, doctors, etc.)

   ... They will be unable to become good technicians (needed for their own livelihood and for national development)

   ... etc.

2. Real Problem: "Rural children do not have a sense of national pride."

   Consequences Possible consequences are:

   ... They will not become good citizens when they grow up

   ... They may be influenced too much by foreign culture

   ... They may not be willing to defend their country

   ... etc.

A **final** note: Problem statements often include probable causes or circumstances or background of the problem. It will not be necessary to learn specific ways to make background statements, since such statements are usually tied to a specific problem.

In your Post Module Practicum, you will be asked to describe the background of problems in your country (National Problems) and in your own work (On-the-job Problems).

MODULE 16

POST MODULE PRACTICUM

This module is the first on the Applications of the Systems Approach. The value in learning "applications" is in your ability to use what you learn on real problems of your own and of your country.

Throughout the remainder of this course, you will be asked to apply what you have learned to

... On-the-job Problems
and
... National Problems.

On-the-job Problems

All of us have a variety of problems in our own work ... problems which we can help solve by using a systems approach.

The first step in the systems approach is the topic of the present module: Formulating Educational Problems. We have learned in this module how to state real problems that do not limit alternative solutions. We have also learned to write the possible consequences of a problem.

In this practicum, therefore, you are being asked to think of practical problems on your job ... problems that you would like to solve.

Step 1. Think of three important problems on-your-job.

Step 2. For each problem, state the real problem.

Step 3. For each problem write a short background explaining some of the causes or circumstances about the problem.

Step 4. For each problem state the possible consequences.

(Use the forms on the next three pages.)

On-the-job Problem # 1

Name: _____

Real Problem _____

Background _____

Consequences _____

On-the-job Problem # 2

Name: _____

Real Problem _____

Background _____

Consequences _____

On-the-job Problem # 3

Name: _____

Real Problem _____

Background _____

Consequences _____

Step 5. Select one of the above three problems for use in all later modules on the systems approach. Write your reasons for slecting the one you do.

Name: _____

Reasons for selecting on-the-job Problem # _____

Real problem: _____

_____

_____

_____

_____

_____

_____

_____

Reasons for selecting: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

National Problems

In addition to the individual On-the-job Problems, each country group of participants will be devoting a portion of their time to National Problems. Application of what is learned in this module and those to follow will be in reference to National Problems.

For this module, meet with colleagues from your country and perform the following steps.

Step 1. Decide on three important educational problems in your country. Make this decision as a group.

Step 2. For each problem, state the real problem.

Step 3. For each problem, write a short background explaining some of the causes or circumstances about the problem.

Step 4. For each problem, state the possible consequences.

Step 5. Finally, select the one national problem your group would like to work on during the remainder of the course. State the reasons why you selected this particular problem.

Step 6. Give you results (Steps 1 - 5) to the Training Office for typing. They will be reproduced for use in the Seminar of Module 17.

Good luck

National Problem forms are on the next pages.

National Problem # 1

Country: _____

Real Problem _____

Background _____

Consequences _____

National Problem # 2

Country: _____

Real Problem _____

Background _____

Consequences _____

National Problem # 3

Country: _____

Real Problem _____

Background _____

Consequences _____

Country: _____

Reasons for Selecting National Problem # _____

Real Problem: _____

Reasons for Selecting: _____

SERIES 5

MODULE 17

SEMINAR ON FORMULATING PROBLEMS

INNOTECH

MODULE 17

SEMINAR ON FORMULATING PROBLEMS

PREVIEW

Module 16 dealt with the first step to be undertaken in the application of the systems approach. In that module you learned how to write problem statements that:

a. focus on the real problem

b. do not limit the number of possible solutions

c. state the consequences if the problem is not solved.

The general purpose of this seminar is to provide opportunities for further strengthening your skills in formulating problem statements and at the same time give you an insight into the most important educational problems in each of the SEAMEO countries.

OBJECTIVES

The participant should be able to

(1) Explain why the national problem chosen by his country group may be considered most important.

(2) Give facts and details related to his country's educational problem and its background in answer to queries from other participants and in a manner that would satisfy such queries made.

(3) Give possible suggestions for improvement of the national problems statements that will be presented.

CORE INSTRUCTIONAL ACTIVITIES

1. The first part of the seminar will be in the form of small-group sessions designed to further sharpen your skills in formulating problems. This will include exercises on restating incorrectly formulated problems. After the small-group sessions, you may want to meet with your country group to further improve the national problem you have formulated, in preparation for the large-group seminar.

2. During the large-group seminar, you will be asked to present the national problem you have chosen, together with other members of your country group and answer questions that may be raised for further clarification. If necessary give more details on the problem and its background. (It is important that your fellow participants will be well acquainted with your national problem as they will be involved in a future activity related to this). Take note of suggestions for improvement of your problem statement that may be given by your fellow participants.

   Raise whatever questions you need to raise. You may also want suggestions for improvement of the problem statements presented by the other country groups.

3. After the seminar you may meet with your country group again to revise and refine your problem statement, taking into consideration the suggestions that may have been given during the seminar. If you need any help, consult any member of the training staff.

SERIES 5

MODULE 18

DERIVING GENERAL OBJECTIVES

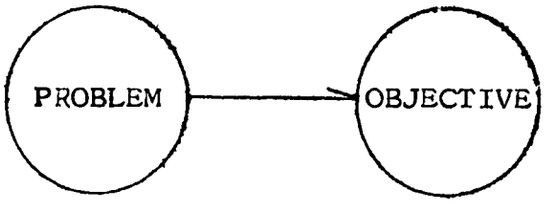
INNOTECH

MODULE 18

OVERVIEW

An objective provides us with a target toward which alternative solutions are directed to solve our problem.

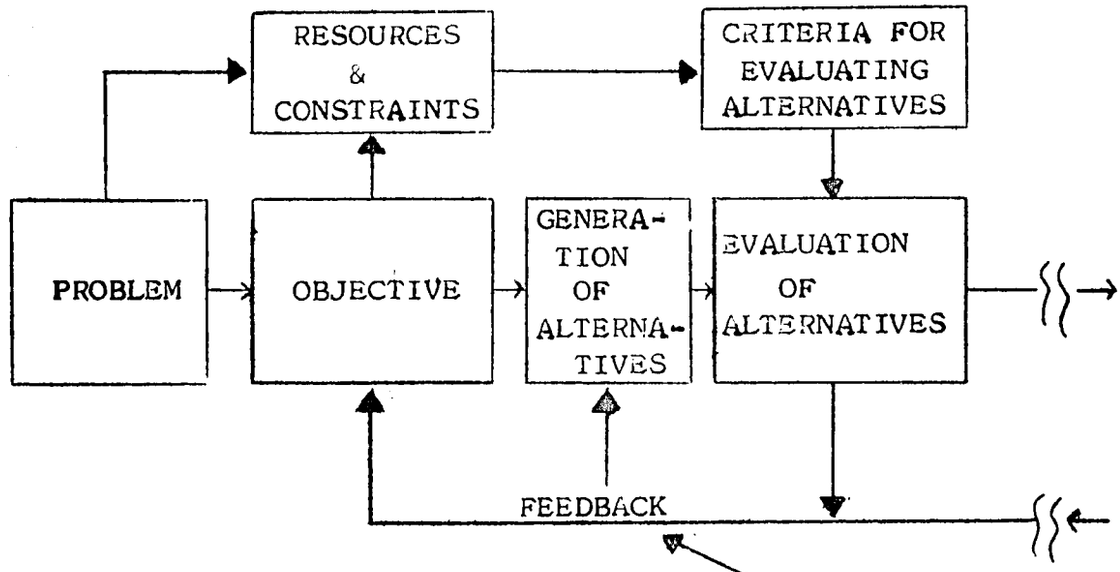
As you will find in this module, objectives come directly from problems:



We are calling this objective a "General Objective".

There are two other kinds of objectives that also will be covered in this course: "Specific Objectives" and "Change Objectives". They are modifications of the General Objective. These modifications are made after we get Feedback from Resources and Constraints and from Alternative Solutions.

You will recall that the various systems approach models showed feedback to objectives. For example, the BPP model:



It is this feedback loop that will be used later in the course in the preparation of Specific Objectives and Change Objectives*.

The present module therefore is on the development of General Objectives from Problems.

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* It is difficult to write Specific Objectives until we know what (specifically) can be achieved via the alternative solutions.

OBJECTIVES

After you have completed this module, you should be able to:

(1) Derive General Objectives from Problems.

(2) Modify Problems that are stated too generally (in INNOTECH words: "too fuzzy".

(3) Prepare clearly-stated General Objectives.

(4) Prepare General Objectives for:

... On-the-Job Problems

... National Problems

CORE INSTRUCTIONAL ACTIVITIES	Complete the module, performing self-evaluation exercises. Check the results of each self-evaluation with the feedback sheets only after completing the self-evaluation.
	Perform the Post Module Practicum after completing the module.
	Please check with the Training Staff if you require assistance.

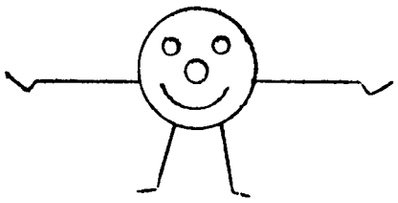
MODULE 18 (PART I)

OBJECTIVES SMILE A LOT

An objective smiles a lot because if we can achieve an objective we will solve our problem.

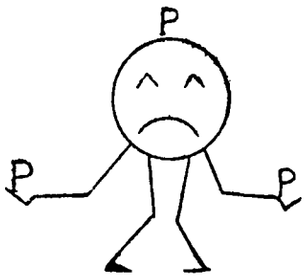
This is an objective

... it smiles a lot ...

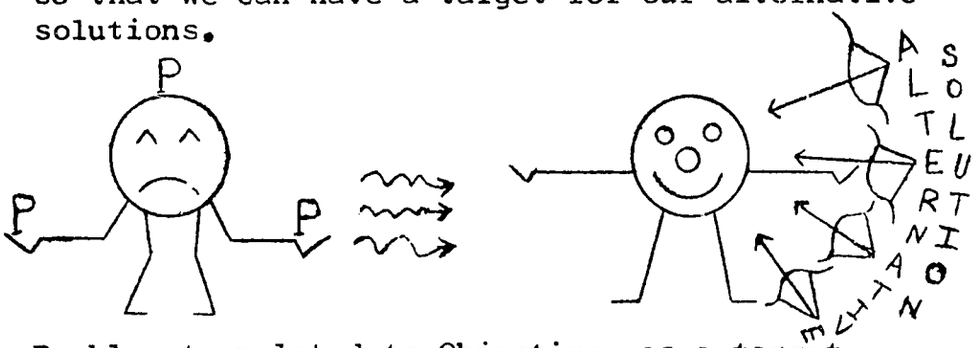


This is a problem

... it cries a lot ...



If we are going to be able to solve a problem, we first have to translate it into an objective ... so that we can have a target for our alternative solutions.



<u>Problem</u> translated to <u>Objective</u> as a target <u>for Alternative Solutions</u>.

There are many kinds of objectives that are used

... targets

... purposes

... aims

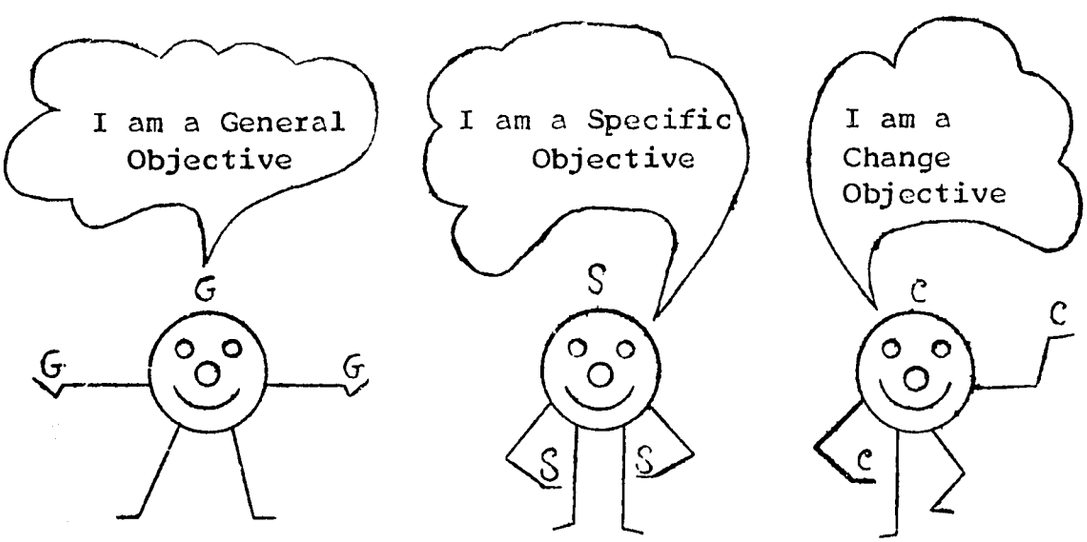
... behavioral objectives

... performance objectives

... measurable objectives

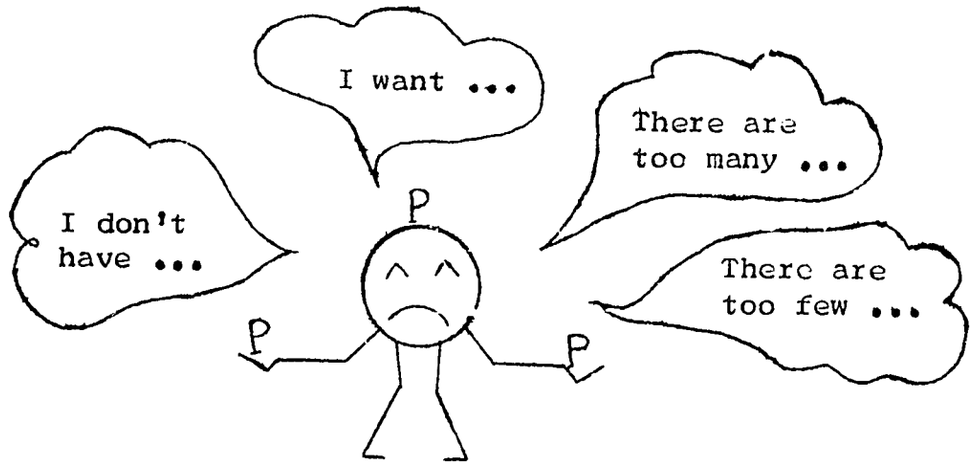
... etc, etc.

In this module we will talk about only three kinds of objectives so that we all can use the same words. The three kinds are (1) General Objective, (2) Specific Objective and (3) Change Objective. INNOTECH's objectives also can talk".

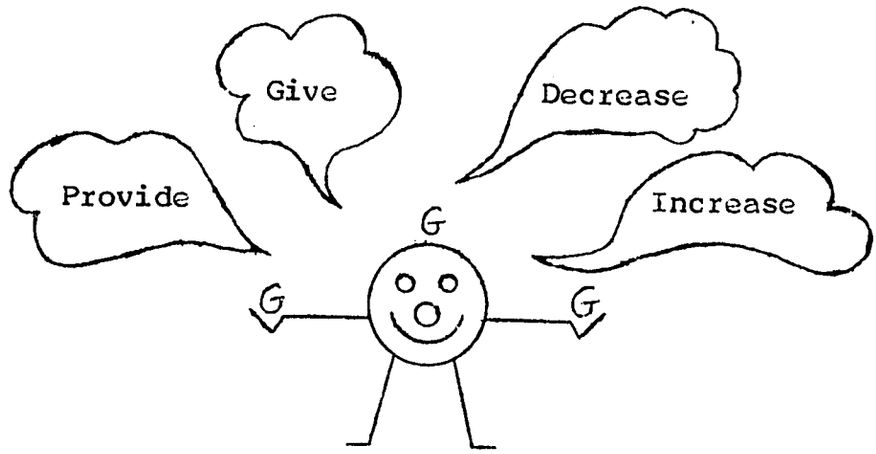


We will cover General Objectives first

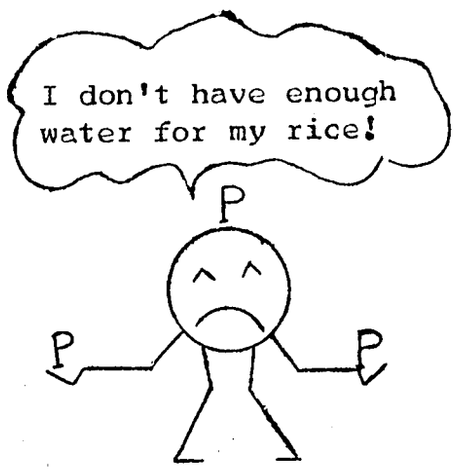
Problems (at INNOTECH) also can talk! A problem usually says ....



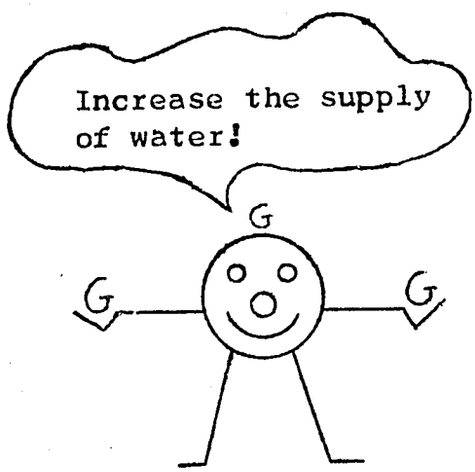
A General Objective can answer the problem by saying ...



Remember the farmer who asked for rain? We decided that his problem was ...

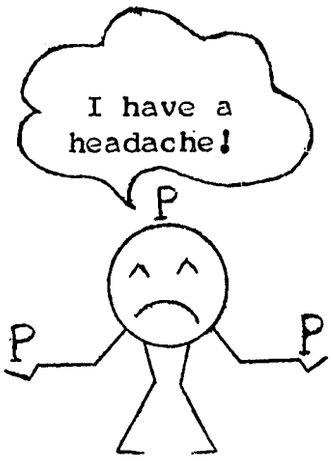


Our General Objective would respond ...

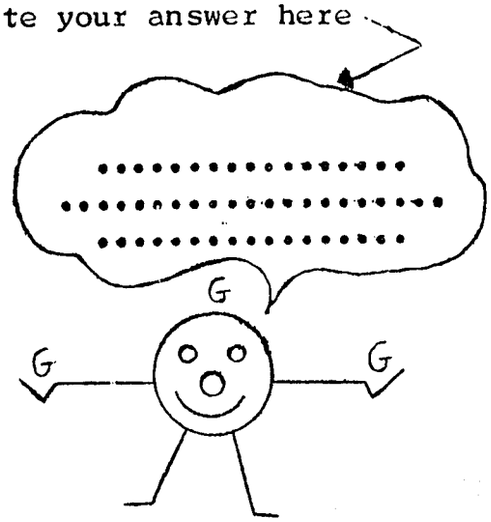


<u>NOTE</u>: "Provide irrigation" or "make it rain" are not correct because they suggest only one solution.

Remember the man with the headache?
His problem was



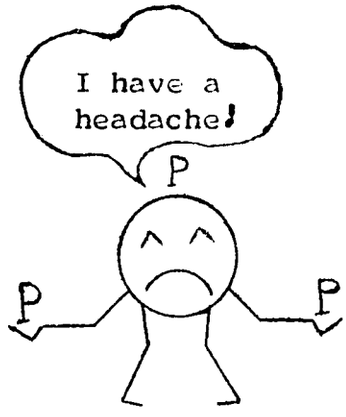
How would the General Objective respond?
Please write your answer here



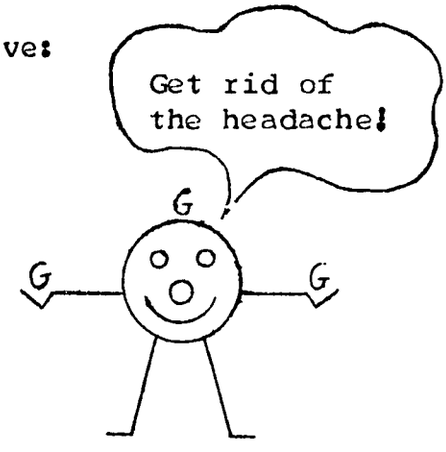
FEEDBACK IS ON THE NEXT PAGE ⟶

FEEDBACK

Problem:



General Objective:



<u>NOTE</u>: "Give medicine" <u>or</u> "Go to doctor" etc. are not correct because they suggest only one solution.

MODULE 18 (PART I)

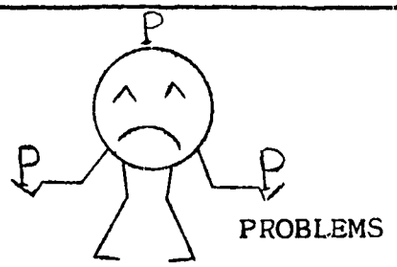
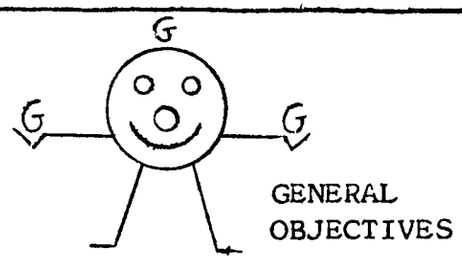
SELF EVALUATION

AND

FEEDBACK

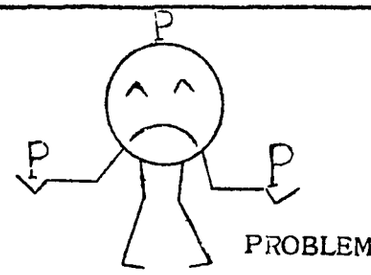
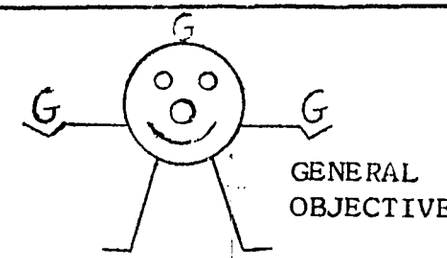
SELF-EVALUATION

Write a General Objective for each Problem below.

	
Too many people are hungry! →	.....
The Ministry makes good plans but often fails to implement them! →	.....

Not enough children get a primary education! →	....
Too few adults know how to vote! →	....
There are not enough technicians! →	....
Too many babies do not get proper vitamins! →	....
Many older people are unable to read! →	....

FEEDBACK (PART I)

	
Too many people are hungry!	Reduce hunger! *** Note: "Grow more food" is not correct it suggests one solution.
The Ministry makes good plans but often fails to implement them!	Improve ability of Ministry to implement plans! *** Note: "Train for implementation" is not correct because "training" is only one solution.

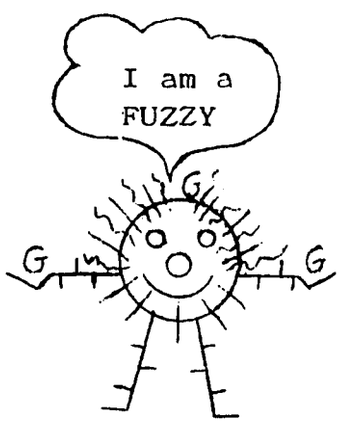
Not enough children get a primary education!	Increase the number of children getting a <u>primary</u> education! *** <u>Note</u>: "Increase the number of schools" is not correct because it suggests one solution.
Too few adults know how to vote!	Increase the number of adults who know how to vote! *** Note: "Teach adults how to vote" is not correct because it suggests one solution.
There are not enough technicians!	Increase the number of technicians! *** <u>Note</u>: "Train more technicians" is not correct because it suggests one solution.

Too many babies do not get proper vitamins!	Increase the number of babies getting proper vitamins! *** Note: "Provide vitamins for more babies" is not correct because it suggests one solution.
Many older people are unable to read!	Increase the number of older people who can read! *** Note: "Teach more older people to read" is not correct because it suggests one solution.

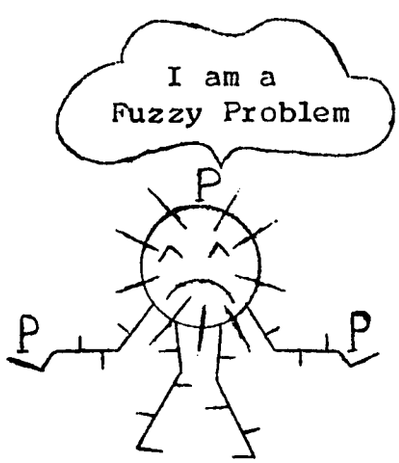
MODULE 18 (PART II)

FUZZIES

"Fuzzy" means that something is not clear. A fuzzy animal has lots of long hair. A fuzzy objective also has lots of long hair and it is not clear.



Fuzzies often come from fuzzy problems.

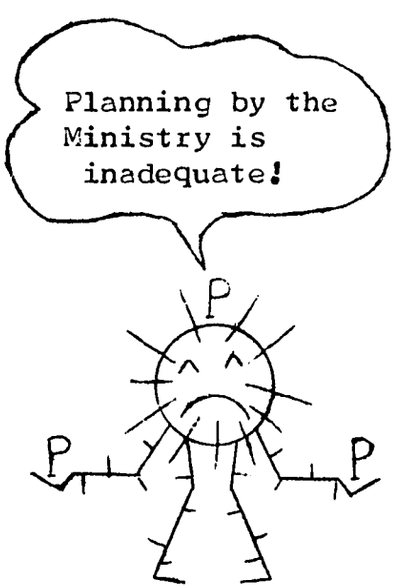


In the last module we talked about stating the "real problem" ... and we meant that a "real problem" did not suggest the solution ... did not limit the number of alternative solutions that could be considered.

A bad problem statement would be ...
"There are not enough trained planners in the Ministry"

A real problem statement might be ...
"Planning by the Ministry is inadequate".

But that statement is a fuzzy problem:



Why do we call that problem statement a "guzzy?"

Because the word "planning" can mean so many things, and the fuzzy problem did not state specifically what performance or behaviors he meant by "planning".

The fuzzy problem might have meant:

... planned time schedules, particularly for curriculum development, are so short that project staff cannot complete their work on time

or

... the objectives of planned development projects are not clearly stated and we cannot determine whether or not they are being achieved

or

... no provisions is made in the plans for evaluation and feedback to enable project staff to make modifications

<u>or</u>

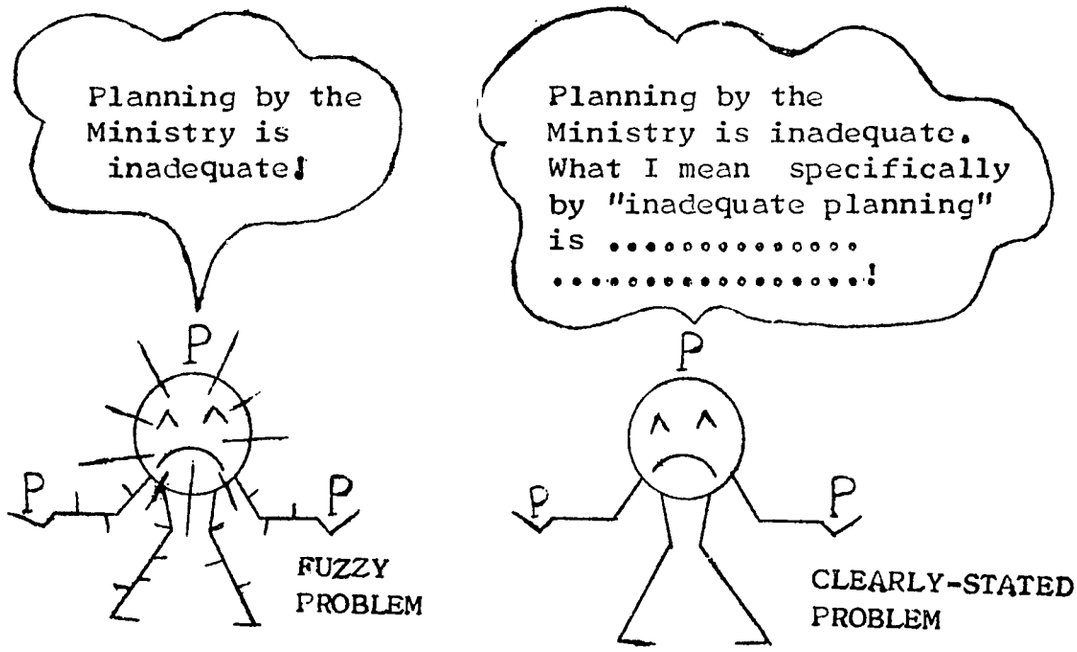
... costs are usually underestimated and projects run out of funds before completion"

<u>or</u>

etc, etc, etc.

****

If our fuzzy problem had given specific examples of what he meant by planning ... he would no longer be a fuzzy. He would have gotten rid of his ugly long hair and would be a <u>clearly-stated problem</u>.

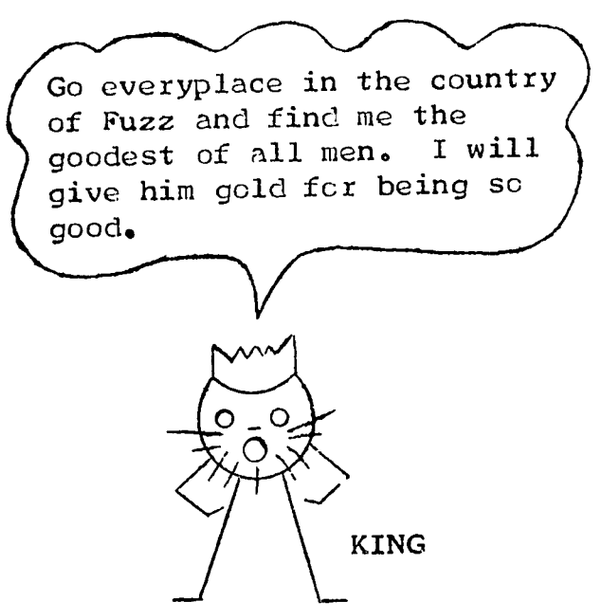


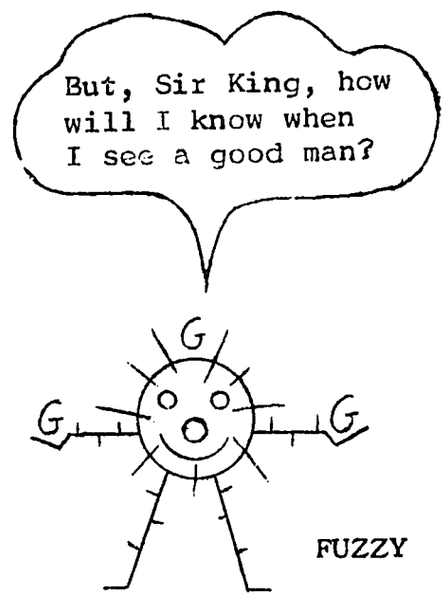
We can eliminate fuzzies in our statement of the problem or we can eliminate them in our statement of the objective.

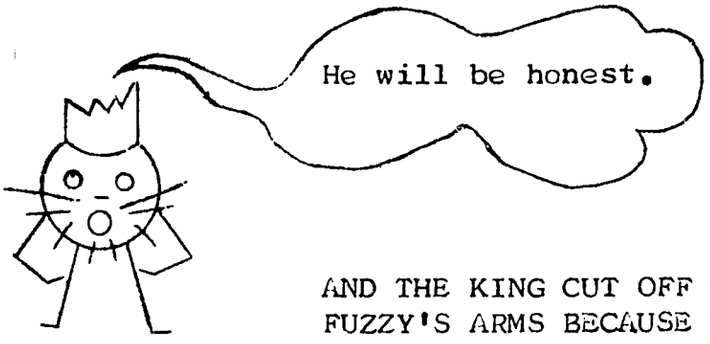
> PLEASE STOP!
>
> Look now at your our statement of the problem, including background and consequences for (1) your on-the-job problem and (2) your national problem. If you find a fuzzy, you may want to change it now. If not, we will try to take care of fuzzies in the objectives.

It is time for a story about fuzzies which we have adapted from one by Dr. Robert Mager. The story goes ....

Once upon a time in the country of Fuzz, the King called his cousin Fuzzy and said.

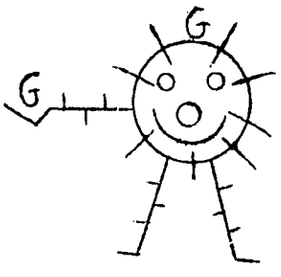




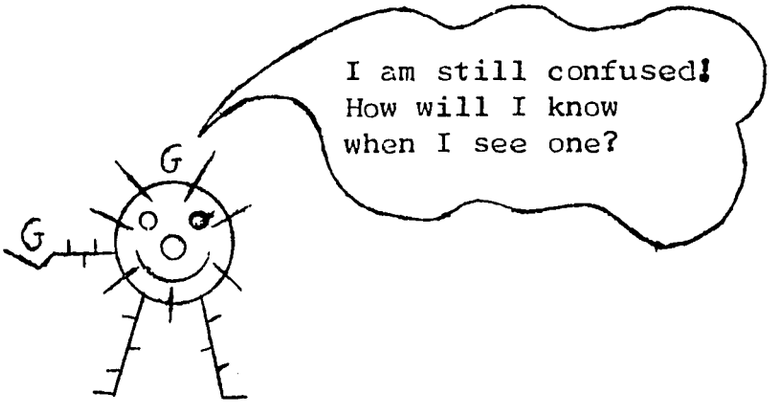


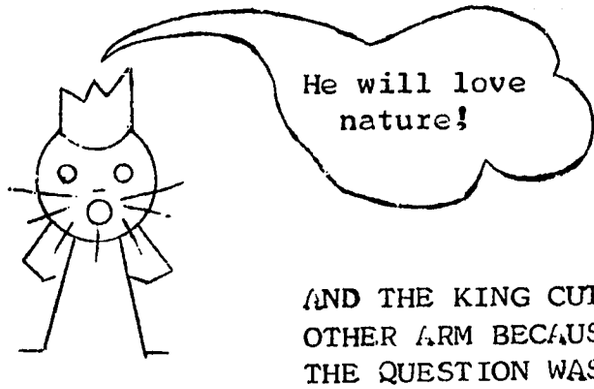
AND THE KING CUT OFF ONE OF FUZZY'S ARMS BECAUSE HE THOUGHT THE QUESTION WAS STUPID.

SO FUZZY WENT AWAY WITH ONLY ONE ARM. HE LOOKED EVERYWHERE FOR A GOOD MAN.



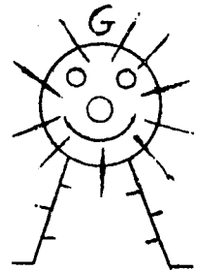
WHEN HE CAME BACK TO SEE THE KING, HE SAID ...



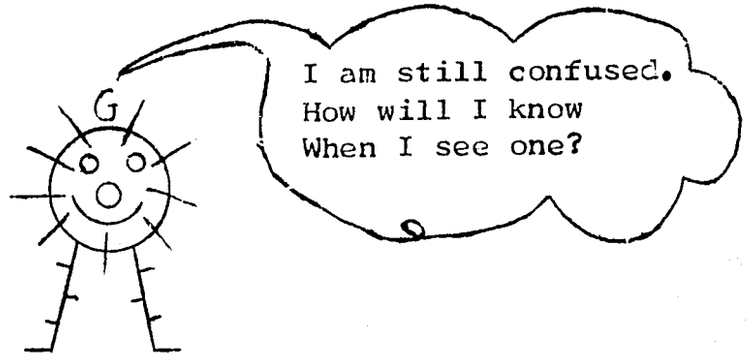


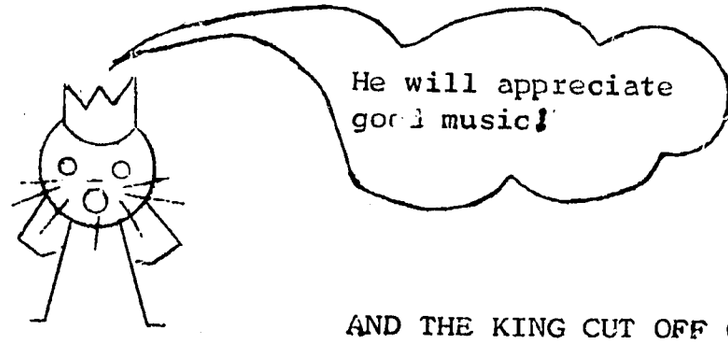
AND THE KING CUT OFF FUZZY'S OTHER ARM BECAUSE HE THOUGHT THE QUESTION WAS STUPID.

SO FUZZY (WITHOUT ARMS) WENT AWAY AGAIN TO LOOK FOR THE GOODEST MAN.



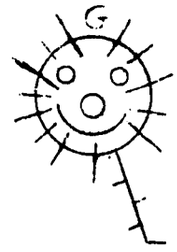
WHEN HE CAME BACK TO SEE THE KING, HE SAID ...





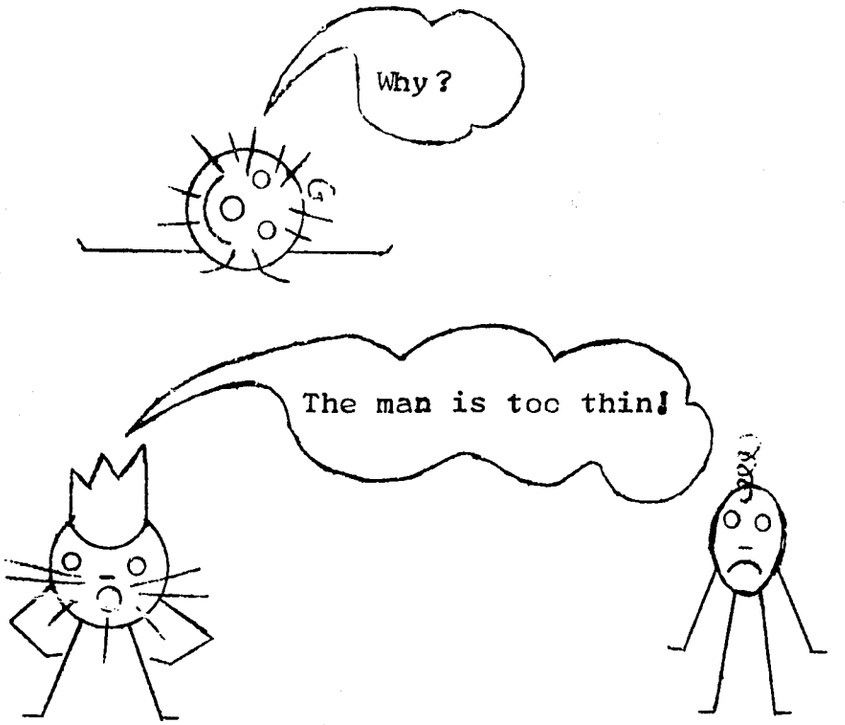
AND THE KING CUT OFF ONE OF FUZZY'S LEGS BECAUSE HE THOUGHT THE QUESTION WAS STUPID.

SO FUZZY, ON ONE LEG, HOPPED AROUND IN THE COUNTRY OF FUZZ.



HE FOUND A MAN ... HE DECIDED THE MAN WAS HONEST, THAT HE LOVED NATURE AND THAT HE APPRECIATED GOOD MUSIC. HE BROUGHT THE MAN TO THE KING.

THE KING WAS ANGRY, AND HE CUT OFF FUZZY'S OTHER LEG. FUZZY FELL DOWN.



THE REASON FOR THE STORY:

If you don't know when you see one, you may be like fuzzy ... with no leg to stand on

Obviously, the king was the most fuzzy of all because he did not give a clear-cut objective for what he meant by "the goodest man".

The king said "honest", but what did he mean?

... does not take money away from children?

... returns things that he finds?

... always takes books back to the library at the time they are due?

... always tells his wife the truth?

... etc,

HE MAY HAVE MEANT ALL THESE THINGS

The king said "loves nature", but what did he mean?

... grows roses in his garden?

... takes long walks in the forest?

... takes pictures of mountains?

... joins groups whose aim is to preserve natural resources?

... etc,

HE MAY HAVE MEANT ALL THESE THINGS

The king said "appreciates good music", but what did he mean?

... buys records of Mozart?

... attends rock-and-roll dances?

... plays his record player very loud?

... blows a frend horn?

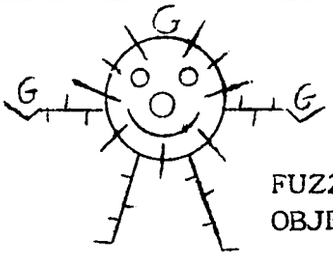
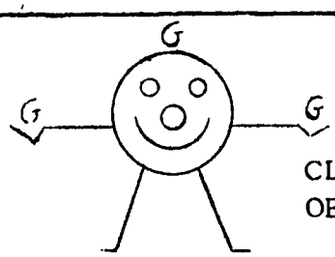
... etc,

HE MAY HAVE MEANT ALL THESE THINGS

The people who write fuzzy objectives usually have something in mind, but they have not stated them. The best we can do with most fuzzies is to give enough examples of what we mean to make our objectives clearly-stated.

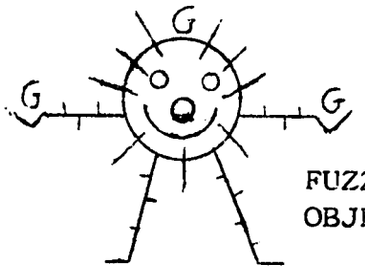
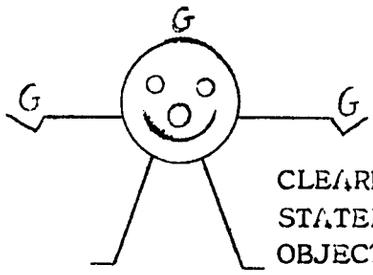
On the next page are some fuzzies, give three examples for each one which you thing are good samples of the behaviors that are included in a fuzzy.

SELF-EVALUATION (PART II)

 FUZZY OBJECTIVE	 CLEARLY-STATED OBJECTIVE - BECAUSE OF EXAMPLES -
Increase applied skills of primary graduates	Examples: 1. Sew clothes 2. _____ 3. _____
Increase literacy	Examples: 1. Read agricultural bulletins and follow directions 2. _____ 3. _____

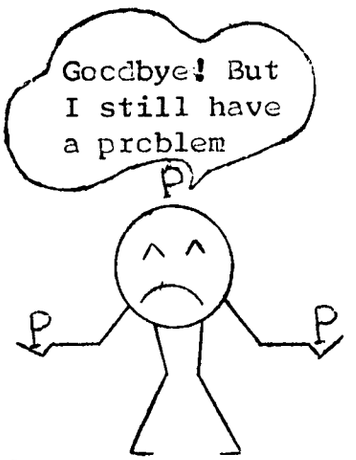
Improve communication among devisions of the Ministry	Examples: 1. Director General's office knows status of building plans 2. _____ 3. _____

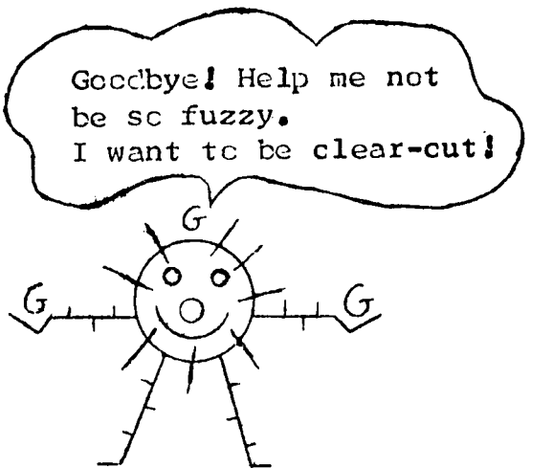
FEEDBACK (PART II)

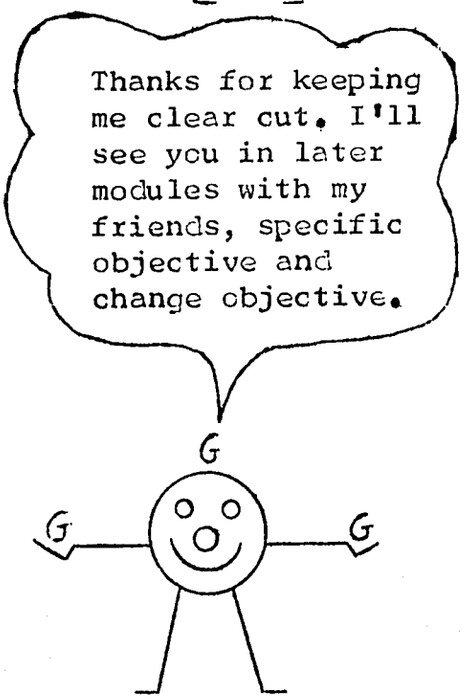
 FUZZY OBJECTIVE	 CLEARLY-STATED OBJECTIVE - BECAUSE OF EXAMPLES -
Increase applied skills of primary graduates	Examples: sew clothes, plant rice, repair bicyle, raise fish, saw wood on a straight line, cook foo foo, or whatever you really mean by applied skills!
Increase literacy	Examples: read agricultural bulletins and follow directions, understand street signs, understand political news in newspaper, fill in application form, read comic books or whatever you really mean by literacy!

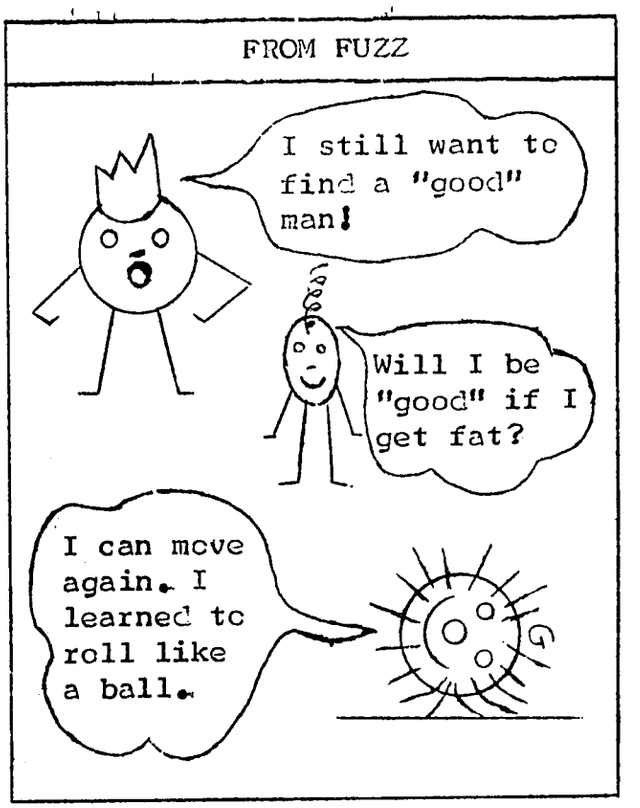
Improve communications among divisions of the Ministry	Examples: Director General's office knows status of building plans, provincial heads know funds available on a monthly basis, every division head knows when other division heads are to be out of the office, all divisions heads give opinions before Minister announces a decision, or whatever you really mean by communications among devisions.

THIS IS THE END OF MODULE 18;
our friends say .....









MODULE 18

POST MODULE PRACTICUM

Introduction

We will take up objectives again after we have studied Resources and Constraints and Generating Alternative Solutions.

For now, the Practicum has two parts:

... On-the-Job Problem

... National Problem

On-the-Job Problem

For your on-the-job problem

1. State the General Objective(s)

2. If necessary, give sufficient examples to insure that your objective is clearly stated. (Use the forms attached).

National Problem

Meet with the colleagues from your country.

1. State the General Objective(s)

2. If necessary, give sufficient examples to insure that your objective is clearly stated. (Use the forms attached).

****

GOOD LUCK !

On-the-job problem Name _____

Problem (1) _____

_____

_____

_____

_____

_____

General Objective(s) _____

_____

_____

_____

_____

_____

Examples (if needed) _____

_____

_____

_____

_____

_____

National Problem Country _____

Problem _____

_____

_____

_____

_____

_____

General Objective(s) _____

_____

_____

_____

_____

_____

Examples (if needed) _____

_____

_____

_____

_____

_____

SERIES 5

MODULE 19

IDENTIFYING

RESOURCES AND CONSTRAINTS

INNOTECH

MODULE 19

PREVIEW

In the next module we will be describing some ways to generate alternatives to achieve objectives. In generating alternatives, however, we must know what resources are available for our use and what constraints we face or must overcome in generating alternative solutions.

****

So that you can see where the course is going from here: In Modules 20 through 22 we will be generating alternative solutions for achieving objectives ... solutions which hopefully can take advantage of the resources described in the present module and which also can either exist within the constraints or somehow overcome them. In Module 23, we will develop criteria, analyze, select and revise alternatives ... and the primary basis for this analysis will be the IEI and the resources and constraints you develop in this module. In Module 25, we will return to an examination of our objectives and be able to be much more specific about them because, by then, we should know how well and to what extent they can be achieved by means of the alternatives which we have generated.

****

OBJECTIVES

Describe specific resources and constraints in one own's country as they apply to:

... on-the-job problems, and

... national problems.

CORE INSTRUCTIONAL ACTIVITIES

First, read the content of this module, doing the self-evaluation exercises and comparing your answers with those provided on the feedback sheets.

Second, if members of your country team are available to work on the module with you -- apply it to your national problem. If they are not available apply it to your on-the-job problem.

Third, make sure you apply the module to both on-the-job and national problems. You may consult anyone at any time.

RESOURCES AND CONSTRAINTS (Part I)

Money is a *resource* if there is plenty of it.
Money is a *constraint* if there is little of it.

Ministerial Policy is a *resource* if it favors the achievement of a given objective.
Ministerial Policy is a *constraint* if it does not favor the objective.

Tradition is a *resource* if it can be used in the achievement of an objective.
Tradition is a *constraint* if it is contrary to the objective.

People are *resources* if they are available and adequately trained.
People are a *constraint* if they are not available or inadequately trained.

SELF-EVALUATION (Part I)

(Complete the sentences)

1. Buildings are *resources* if they _____

   _____

   _____

   Buildings are *constraints* if they _____

   _____

   _____

2. Time is a *resource* if you have plenty of it.

   Time is a *constraint* if _____

   _____

   _____

FEEDBACK (Part I)

1. Buildings are *resources* if they *are available, are adequately designed, are well maintained, in the right locations, etc.*

   Buildings are *constraints* if they *are in short supply, are poorly designed, are not maintained, are in the wrong locations, etc.*

2. Time is a *resource* if you have plenty of it.

   Time is a *constraint* if *you need to achieve the objective in a relatively short time, if the problem is crucial and cannot wait, etc.*

RESOURCES AND CONSTRAINTS (Part II)

Resources and constraints were first mentioned in the IEI. When you first used the IEI, we asked you to check one of three boxes:

Resource or Asset	Constraint or Liability	Not Applicable
☐	☐	☐

You checked answers in these boxes with regard to the innovative approach which you were asked to evaluate and adopt for use in your own country.

Such questions were asked (about the innovation):

... Are foreign experts required?
... Will expensive supplies be required?
... Will time be needed for local production?
... Is funding likely for future maintenance?

In using the IEI, our focus was on revising and adapting an educational innovation for use in one's own country. And we will use it again in selecting and revising the alternatives which will be generated in Modules 20-23.

The IEI, however, is appropriate only when considering alternatives -- not when considering objectives.

Resources and constraints must first be considered in relation to objectives (as we will do in this module) because we need a good idea of what resources are available ... to help in achieving our objective ... and what constraints exist which either restrict our possible alternatives or must be overcome ... in achieving our objective.

Different resources and constraints exist for different objectives.

For example, if you want to build a house you might have resources such as:

... bank loans;

... trees on your property which you can use for wood;

... an old building which can be torn down so that you can use some of the materials from it;

... neighbors who might be willing to help;

... etc.

And you might have constraints such as:

... flooding of the property during the rainy season;

... local building laws which restrict you to certain types of buildings;

... lack of heavy equipment or electricity in the community;

... need to ship materials by river because roads are inadequate;

... children are of an age and sex that they cannot sleep in the same bedroom;

... etc. etc.

It is with these explicit resources and constraints in mind that you can consider different alternatives (both in the design of the house and in the way you will build it) ... to achieve your objective: build a house.

If you had a different objective, you might have different resources and constraints.

For example, if you want to increase the number of secondary school students who intend to limit their family size after they are married you might have resources such as:

... family planning movies available free from UNESCO;

... local doctors or other health workers willing to assist in instruction;

... a national policy in favor of family planning;

... results of studies conducted elsewhere indicating the most successful ways of achieving your objective;

... a Parent-Teacher Association favoring the objective and willing to assist at school and home;

... the effectiveness of using puppets in the culture for dramatizing a variety of stories and fables;

... etc. etc.

And you might have constraints such as:

... religious objections to some methods of family planning;

... a tradition of large families;

... inability of most persons to afford the means for limiting family size;

... rumors of new "green revolution" type breakthroughs to produce more food;

... a tradition of early marriage;

... cultural hesitancy in discussing topics related to childbirth;

... difficulty in measuring whether or not students "intend" to limit family size;

... etc. etc.

It is with these explicit resources and constraints in mind that you can consider different alternatives to achieve your objective: increase the number of secondary school students who intend to limit their family size after they are married.

PART II

SELF EVALUATION
AND
FEEDBACK

*

* *

_____ SELF EVALUATION (Part II) _____

On the next page, list four possible resources and four possible constraints in achieving the objective: <u>increase the number of adults who are well-informed about political issues so that more can vote intelligently</u>.

List possible resources and constraints below.

Possible resources could include:

... _____

_____

... _____

_____

... _____

_____

... _____

_____

Possible constraints could include:

... _____

_____

... _____

_____

... _____

_____

... _____

_____

FEEDBACK (Part II)

Below are some suggested possible resources and constraints. We are sure that your own answers are as good or better than those we give below.

Possible resources could include:

... A national program for adult literacy

... radios in each community

... regular community meetings usually held in most places;

... active political groups willing to inform local meetings of their own viewpoints

... increased literacy among children which could allow them to read newspapers to illiterate persons;

... university student groups willing to assist in information programs;

... etc. etc.

Possible constraints could include:

... illiteracy;

... absence of newspapers in many villages;

... tradition of voting according to what village leaders say is best;

... a one-party system in the country;

... a fear among many that their votes are not kept secret;

... such extreme poverty in some areas, that many adults feel they can only devote themselves to working for a living

... etc., etc.

RESOURCES AND CONSTRAINTS (Part III)

The Systems Approach insists that we be "systematic" in what we try to do. In being systematic about resources and constraints, we should systematically consider different kinds of resources and constraints in relation to a given objective. From now on, therefore, we will consider resources and constraints under 9 topics:

1. Funding
2. Personnel
3. Organizations and Institutions
4. National Support and Assistance
5. Local Support and Assistance
6. Culture, Tradition, Religion and Morals
7. Facilities
8. Supplies
9. Communications and Transport

There will <u>not</u> be a Self-Evaluation/Feedback following Part III. Instead, we will give a series of examples of resources and constraints under each of the above topics and will ask you to give one more example appropriate to your own country. Space is provided for your examples underneath those we give.

For this practice the objective we are trying to achieve is: <u>increase the number of technically-trained secondary school students</u>.

1. Funding

Possible resources could include:

... Australia has indicated an interest in providing monetary assistance for technical training;

... the national budget has allocated $200,000 for technical training alone;

... light and heavy industries might be able to assist in funding for specific types of technical training so that they could employ graduates later;

... [Example from your country] _____

_____

_____

Possible constraints could include:

... technical training is not in the current program of any potential donor;

... the national budget does not have funds for technical training;

... local secondary schools do not have sufficient funds;

... because of the economy, we dare not increase school fees;

... [Example from your country] _____

_____

_____

2. Personnel (local or foreign experts, teachers, parents, administrators, students, community members, university faculty, businessmen, farmers, etc.)

Possible resources could include:

... willingness of local industries to provide persons from their staffs for part-time teaching;

... UNESCO has expressed a willingness to supply experts in technical training;

... the Japanese embassy has experts in-country who might be willing to assist;

... recent graduates of technical training institutions might made available for short periods to assist at the local level;

... parents might be willing to assist in administrative duties (such as keeping records);

... [Example from your country] _____

_____

_____

Possible constraints could be:

... there are few technically-trained persons except in urban areas;

... the majority of present secondary school teachers are not capable of giving technical training;

... teacher-training colleges have few facilities for producing technical training teachers;

... no foreign aid program presently provides for technical training expertise;

... [Example from your country] _____

_____

_____

3. Organizations and Institutions

Possible resources could include:

... ... industrial plants and organizations with an interest in better-trained graduates;

... bilateral foreign support agencies with a technical training component in their current programs;

... existence of technical training centers whose facilities on personnel could be used on a wider scale;

... universities who could help in the support of a technical training program;

... [Example from your country] _____

_____

_____

Possible constraints could include:

... teacher associations whose interest in academic rather than technical training;

... PTA's who might consider technical training as undignified for their students and children;

... student organizations dedicated to culture, fine arts, history and law;

... patriotic organizations who might consider technical training as a "foreign influence";

... [Example from your country] _____

_____

_____

4. National Support and Assistance

Possible resources could include:

... technical training is given priority in the present 5-year plan;

... presidential decrees amphasize technical training;

... national industrial associations call for better technical training;

... the Ministry of Education has established a special division for technical training;

... [Exemple from your country] _____

_____

_____

Possible constraints could include:

... technical training is given a very low priority in development plans;

... money is allocated for other than technical training;

... emphasis, at the national level, is given to academic training;

... speaches of high officials infer that technical training is either not adequate professional preparation or is an incursion of foreign influence;

... [Example from your country] _____

_____

_____

5. Local Support and Assistance

Possible resources could include:

... willingness (at the local level) to build or provide facilities for secondary school technical training;

... local industries willing to hire graduates;

... local community leaders willing to contact universities, national agencies, etc. to ask for assistance;

... possibility of building some additional training spaces by community labor;

... [Example from your country] _____

_____

_____

Possible constraints could include:

... attitudes valueingacademic learning over technical training;

... concern with own affairs that do not include extra effort for any kind of education;

... lack of qualified persons in the community to assist in technical training;

... [Example from your country] _____

_____

_____

6. Culture, Tradition, Religion and Morals

Possible resources could include:

... a work ethic in the country of valueing productive labor;

... tradition of secondary school graduates working before going into higher education;

... possibility of using stage-type dramas to present the need for technical education;

... a work-oriented community service is practised throughout the country;

... [Example from your country] _____

_____

_____

Possible constraints could include:

... tradition of secondary school graduates not "getting their hands dirty";

... consideration of technicians as being lower in status than academically trained persons;

... religious practice of persons of a certain age spending one year in the pagoda;

... [Example from your country] _____

_____

_____

7. Facilities (Buildings, rooms, equipment, etc.)

Possible resources could include:

... use of primary school after school hours,

... willingness of community to build required facilities;

... possibility of equipment gifts from specific foreign donors;

... use of industrial space after work hours;

... [Example from your country] _____

_____

_____

Possible constraints could include:

... lack of equipment for technical training;

... distance from training facilities for most trainees;

... limited space available for technical training because of the need to use for other types of education;

... no electricity available in the majority of locations;

... [Example from your country] _____

_____

_____

8. Supplies (and materials)

Possible resources could include:

... many waste products from local industries could be used;

... the Canadian Government is willing to provide paper for technical training courses;

... the majority of supplies are available locally, including the mayor's car for use in mechanical training;

... many things can be built locally;

... [Example from your country] _____

_____

_____

Possible constraints could include:

... there are no technical workbooks available in my language;

... paper is in short supply;

... there is no computer in my country at this time, so trainees in computer sciences could not have realistic practice;

... local industries import technicians from the cities and overseas...they typically only want local day labor;

... [Example from your country] _____

_____

_____

9. Communications & Transport

Possible resources could include:

... a nation-wide radio network;

... a regular train service to most provincial capitals;

... plans (in three years) for an educational television system;

... the Ministry runs a pouch three times each week to each district education official;

... [Example from your country] _____

_____

_____

Possible constraints could include:

... no telephones in the majority of communities;

... mail takes as much as three weeks to distant points in the country;

... roads are impossible in the Northeast during the rainy season;

... the islands in my country are so numerous are separated that it would take one person three years to visit each one by boat;

... [Example from your country] _____

_____

_____

RESUME

Resources and constraints need to be stated as explicitly as possible in relation to the objective that you are trying to achieve. They help to give a picture of the real world in which we must work later in trying to generate alternative ways of achieving our objectives.

Resources and constraints are primarily assets or liabilities in achieving a given objective. We must consider them in relation to our objectives.

Resources and constraints differ from country-to-country and location-to-location, and we must be as explicit as possible about them in the location in which we will try to achieve our objective.

Part of the Systems Approach is a "systematic approach" to considering resources and constraints. This course has provided nine topics for considering (systematically) resources and constraints. There may be others, but the nine should help you to be systematic.

POST MODULE PRACTICUM

First, meet with your country colleagues and compare your "Examples from your own contry" in Part III. Make sure that all of you understand what is meant by resources and constraints under each of the nine categories. Call upon the Training Staff as you need.

Second, use the forms on the next pages (form I) to describe resources and constraints in relation to the objective derived from your on-the-job problem.

Third, meet with your country colleagues and use Form II to describe resources and constraints in relation to the objective derived from your national problem.

****

Please ask the training staff for help or guidance!

ON-THE-JOB PROBLEM

1. Funding

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

2. Personnel

Resources include:

a. _____

b. _____

c. _____

d. _____

e. _____

Constraints include:

a. _____

b. _____

c. _____

d. _____

e. _____

3. Organizations and Institutions

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

4. National Support and Assistance

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

5. Local Support and Assistance

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

6. Culture, Tradition, Religion and Morals

Resources include:

a. _____

b. _____

c. _____

d. _____

e. _____

Constraints include:

a. _____

b. _____

c. _____

d. _____

e. _____

7. Facilities

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

8. Supplies

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

9. Communications and Transport

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

NATIONAL PROBLEM

1. **Funding**

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

2. Personnel

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

3. Organizations and Institutions

Resources include:

a. _____

b. _____

c. _____

d. _____

e. _____

Constraints include:

a. _____

b. _____

c. _____

d. _____

e. _____

4. National Support and Assistance

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

5. Local Support and Assistance

Resources include:

a. _____

b. _____

c. _____

d. _____

e. _____

Constraints include:

a. _____

b. _____

c. _____

d. _____

e. _____

6. Culture, Tradition, Religion and Morals

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

7. Facilities

Resources include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

8. Supplies

Resouces include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

Constraints include:

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

9. Communications and Transport

Resources include:

a. _____

b. _____

c. _____

d. _____

e. _____

Constraints include:

a. _____

b. _____

c. _____

d. _____

e. _____

SERIES 5

MODULE 20

OPEN YOUR MIND
TO
GENERATE ALTERNATIVES

INNOTECH

MODULE 20

PREVIEW

This is the first of three modules about generating alternatives. The main ways that we can generate alternatives are

... be open-minded, consider many solutions, avoid assumption that may limit your alternatives; got ideas from all sources...

... find out what has been done to achieve similar objectives elsewhere, consider expert opinion;

... interest with other people... brainstorming for creative ideas.

The above three ways are the topics of Modules 20, 21 and 22.

In Module 20, we should have some fun trying to open our minds to a variety of ways for looking for solutions.

Have fun! Think differently! Think creatively!

OBJECTIVES

After the completion of this module, you will be able to:

(1) Avoid limiting assumptions that may limit the number of alternatives you can consider;

(2) Avoid sticking to one single solution;

(3) Use available resources for solutions;

(4) Use many sources to get a variety of creative ideas.

CORE INSTRUCTIONAL ACTIVITIES	Read the module. Answer questions and check your answers with feedback sheets. If you have difficulty with any portion of the module, consult one of the Training Staff.

MODULE 20 (Part I)

- **Limited assumptions** bring limited alternatives

THE GREEN PILL

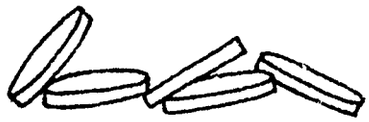
ALI HAD A HEADACHE.

HE TOOK A GREEN PILL.

ALI STILL HAD A HEADACHE:

HE TOOK ANOTHER GREEN PILL

HE STILL HAD A HEADACHE.



HE TOOK MORE GREEN PILLS.

HE DIED. POOR FELLOW!

PROBLEM: HEADACHE

OBJECTIVE: FINISH HEADACHE

SOLUTION: GREEN PILLS (AND MORE GREEN PILLS)

RESULT: POOR FELLOW!

Ali made a limited assumption that the only way to cure a headache was to take green pills. He found out, too late, that <u>his limited assumption also limited his possible solutions</u>, and he stayed with only one solution ... the deadly green pill!

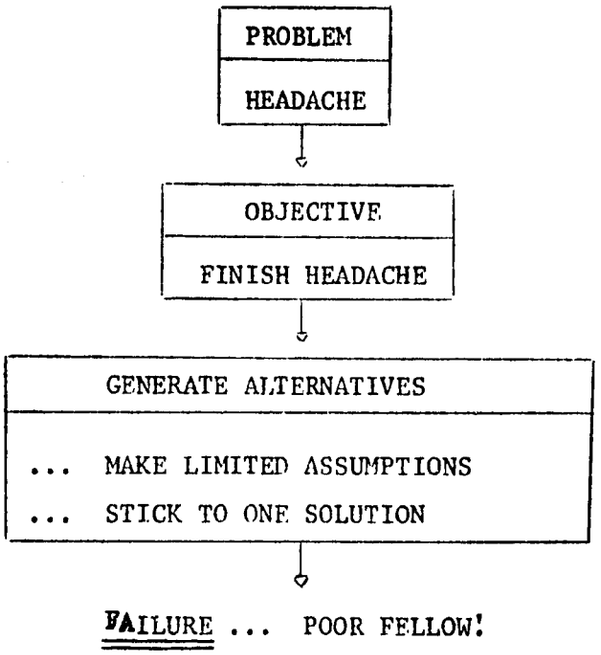
X X X X X X X X X

He could have thought about other assumptions:

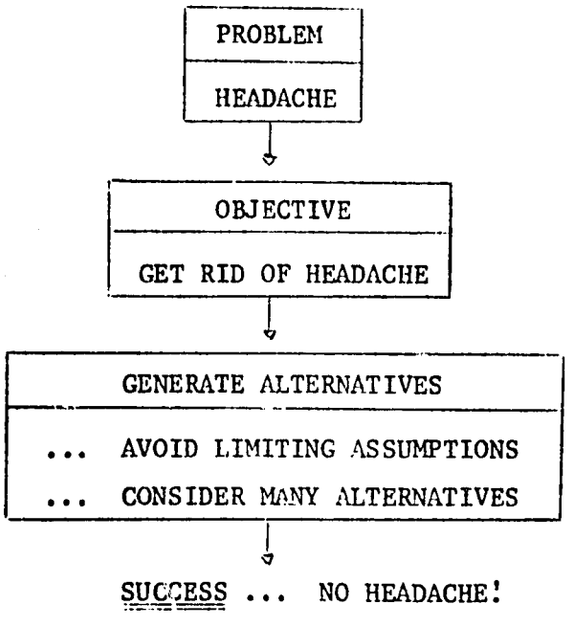
... eye strain ⟶ ... get glasses
... too much whisky ⟶ ... stop drinking
... needs love ⟶ ... get married
... fight with girl ⟶ ... get new girl
... hat too tight ⟶ ... take it off

... or many others ...

We could draw Ali's case:



- He could have lived, and he could have gotten ride of his headache, if he would:



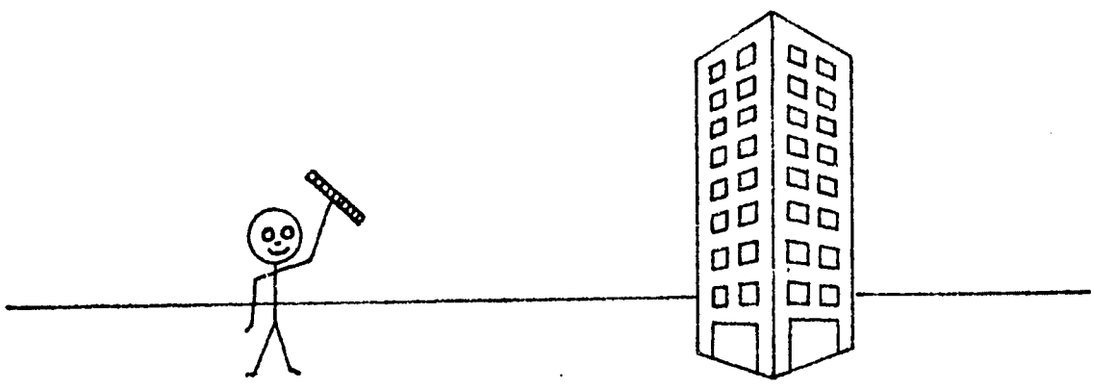
Don't be an Ali.

MODULE 20 (PART II)

MAKING USE OF AVAILABLE RESOURCES

- They can provide you with many alternative solutions.

<u>Example A</u> Objective: Measure the height of a building.
Resource: Meter stick.



The boy wants to measure how tall the building is. His only resource is a meter stick. Name three ways he could use the meter stick to measure the height of the building.

1. _____

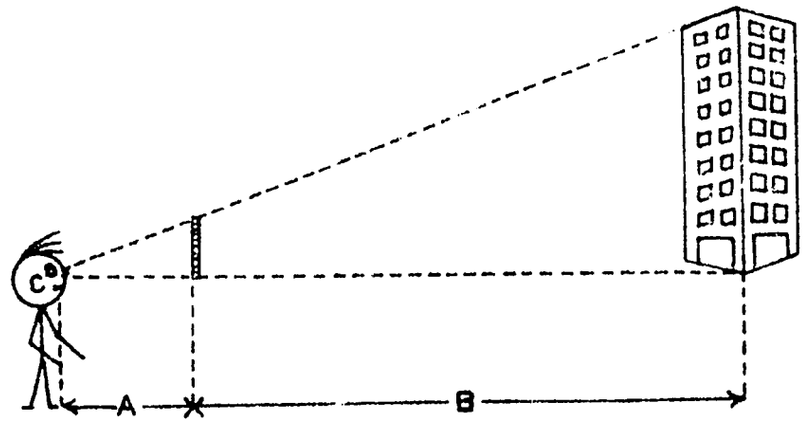
2. _____

3. _____

FEEDBACK

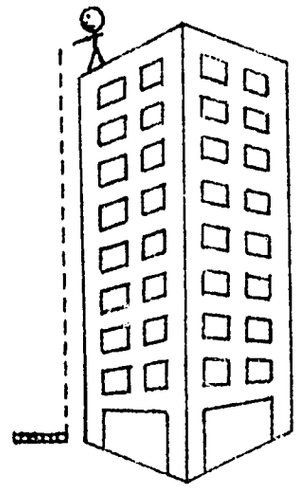
Possible uses of the only resource (meter stick) are:

1.



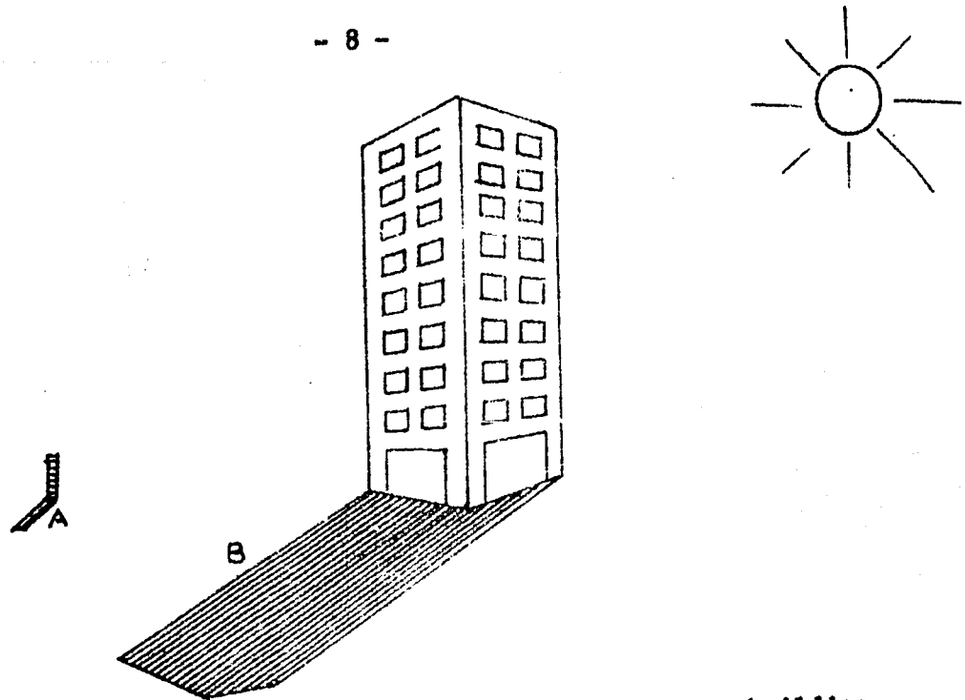
He could hold out the stick so that it completely covers the building from top to bottom. Then he could use the stick to measure "A" and "B". The height of the building (in meters) would be: $\frac{B}{A}$.

2.



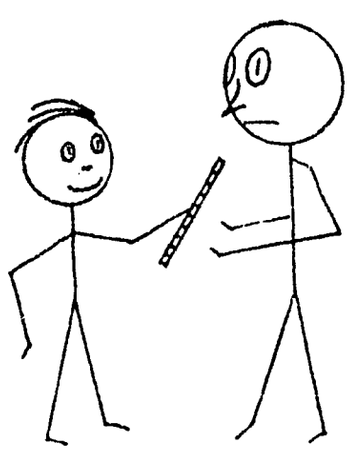
He could drop the stick from the top of the building and count how long it takes the stick to reach the ground.

3.



HE COULD USE THE STICK TO measure the shadows of the building and of the meter stick. Again $\frac{B}{A}$ would give the building's height

4.

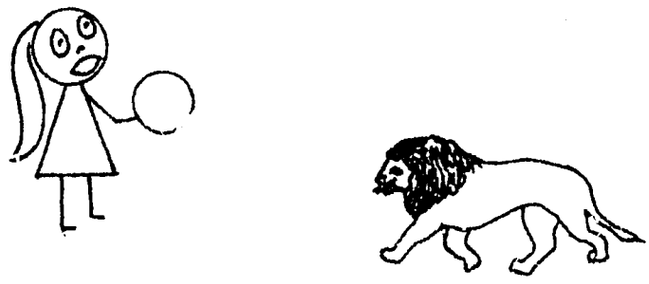


He could offer to give the meter stick to the manager of the building in exchange for the manager telling him how tall the building is.

Example B

Objective: Make a hungry lion go away.

Resource: Rubber balloon.



The little girl is afraid of the big hungry lion. Her only resource is a balloon. How can she make the hungry lion go away?

1. _____

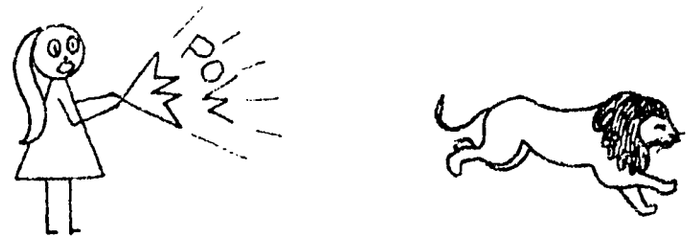
2. _____

3. _____

FEEDBACK

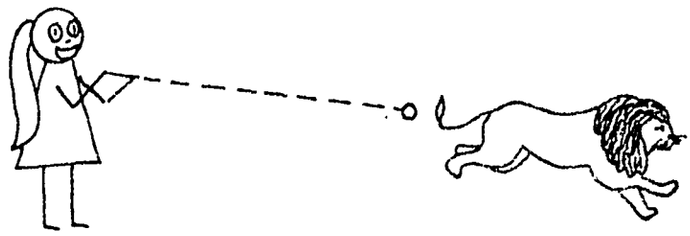
Possible uses of the only resource (balloon) are:

1.



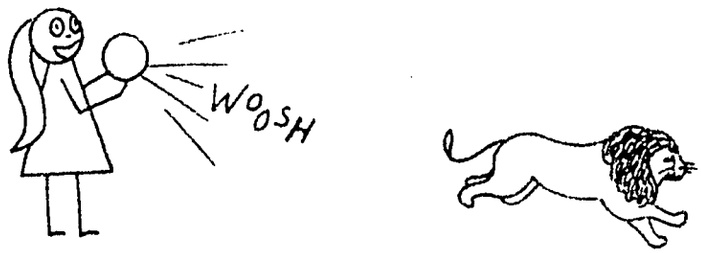
Explode the balloon and point her finger at the lion. He will think the little girl has a gun.

2.



Use the rubber to shoot a stone at the lion.

3.



Let the air out of the balloon to make a sound to frighten the lion.

Example C

Objective: Have sufficient food for everyone in the world

Resources: Everything in the world

The people on this world looked at each other and said: "Too many of us are hungry." They asked, "What should we do?"

- What can be done?

1. _____

_____

_____

2. _____

_____

_____

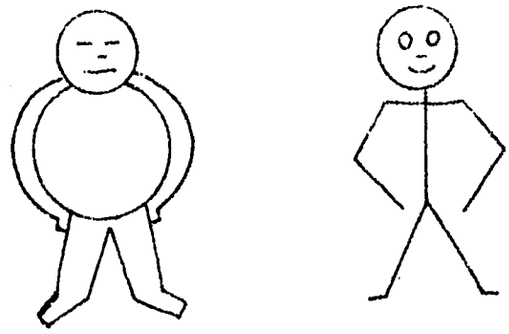
3. _____

_____

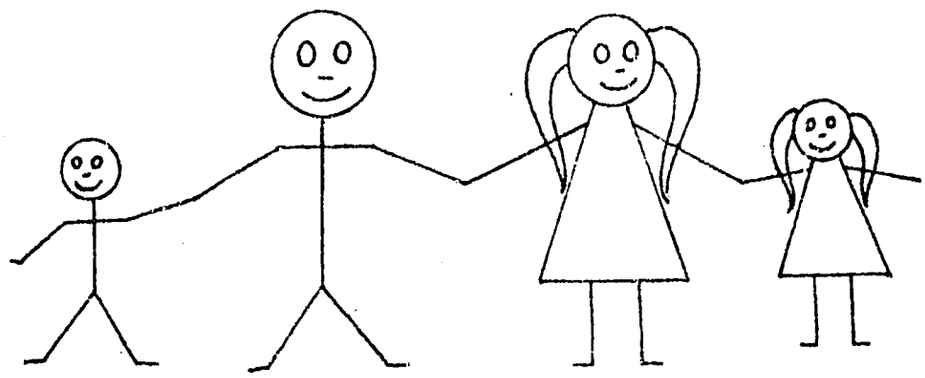
_____

FEEDBACK (Possible Alternatives)

1. Pass a law that all fat people have to go on a diet.

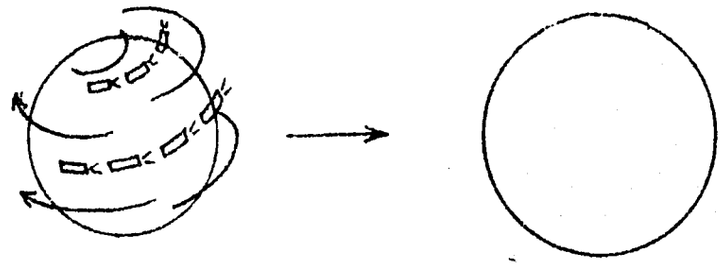


2. Convince every family to have only two children.



3. Grow mushrooms in caves under the ground.

4. Attach jets to the world to make it turn fast enough to expand (centrifugal force) so that there will be more land for food.



Why are we giving silly answers?

We are giving silly answers to free our minds from only thinking in traditional ways.

It is important to have free-thinking minds so that we can overcome the many educational problems in our region that cannot be solved in traditional ways.

MODULE 20 (PART III)

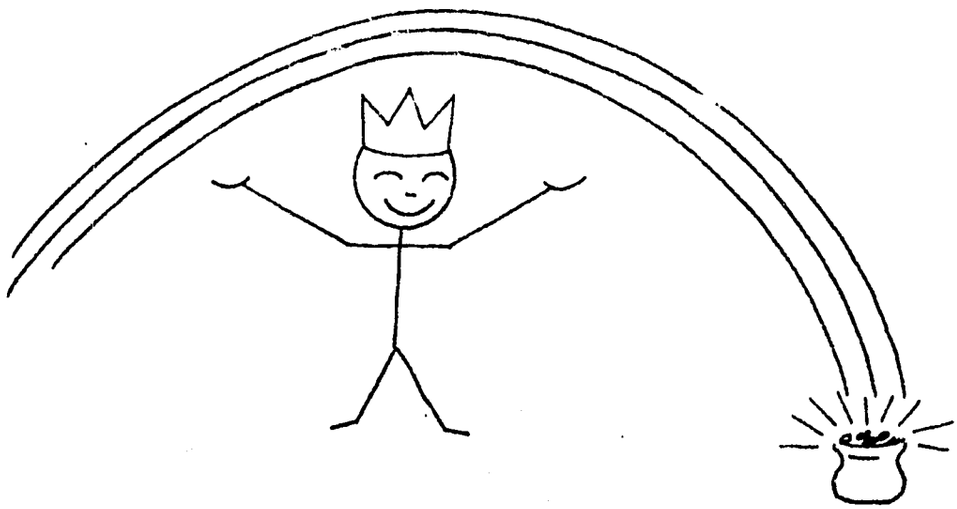
- USING ALL POSSIBLE SOURCES OF IDEAS

A GOLDEN STORY

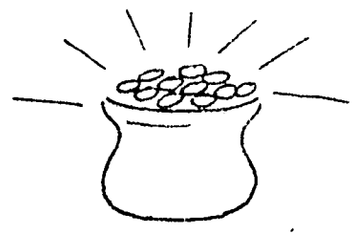
In a land not so far from here the people were very poor. One day the sun shone bright through a light rain and made a very beautiful rainbow. All the people came out of their houses to look at the beautiful rainbow.

The King also came out of his palace to see the rainbow. He was very happy!

He was happy because he knew that at the end of the rainbow was a big pot of gold.

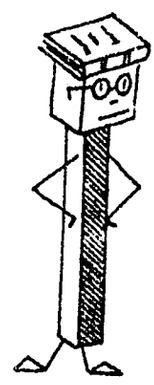


If he could find the pot of gold, his people would not be poor any more. They would all have enough gold.



The King called his two best advisors and asked them to find the pot of gold.

One advisor was thought by everyone to be very smart because he was always reading books by the greatest experts and authorities.

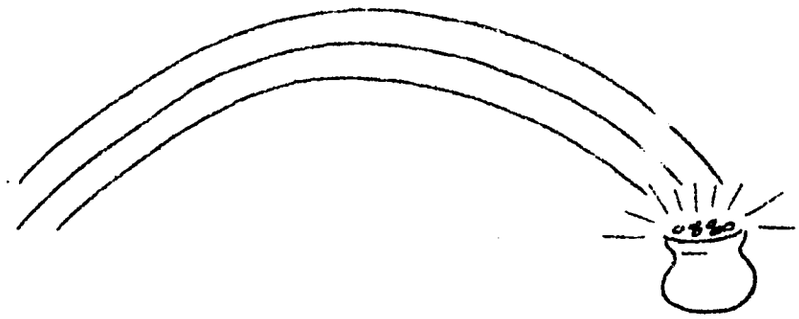


He liked to read books by authorities so much that he always carried a book on his head. His name was AUFOL (pronounced "awful"), and the King respected him because he was so smart.

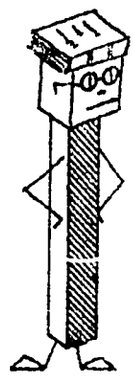
The King's other advisor was a young girl. All the people thought that she was magic. After all she had fairy wings and carried what people thought was a magic wand. She also seemed to be able to do things that even AUFOL couldn't do.

Her name was CRINKER, and everyone loved her because she talked to all the people - from the King to the farmer. She was usually asking them questions.

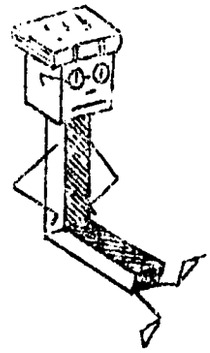
The King told his two advisors, AUFOL and CRINKER to find the big pot of gold at the end of the rainbow.



AUFOL and CRINKER started off together

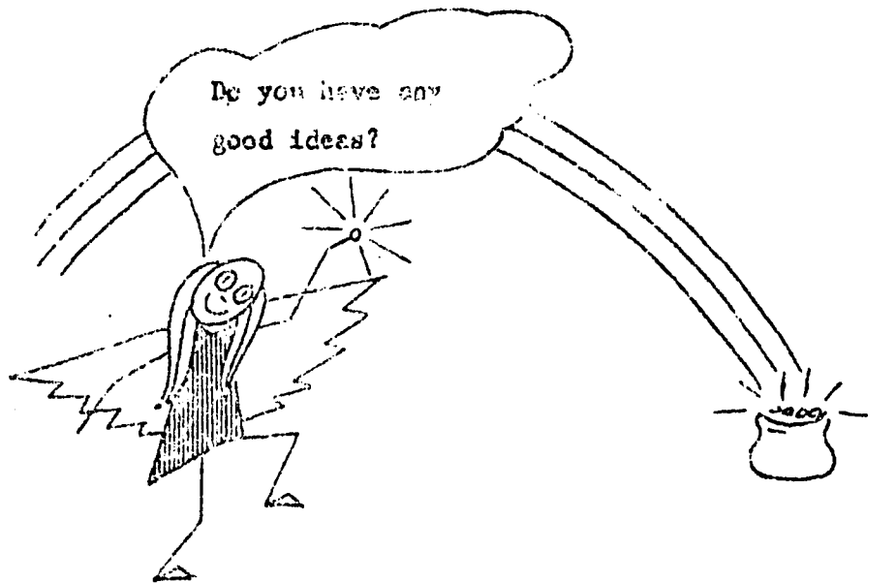


to find the big pot of gold. Before long, however, AUFOL sat down



to hang his head to find out what Dr. Authority had written in his book about finding big pots of gold at the end of rainbows.

CRINKER flew with her fairy wings, going from house to home. To everyone she met, she asked the same question.

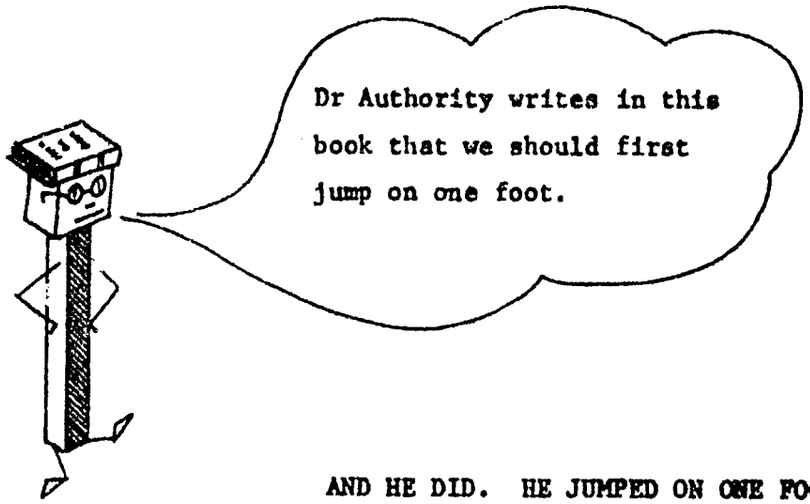


At first, the people were a little shy. They knew that AUFOL had read all the books of Dr. Authority. Could any of their own ideas be any good? But CRINKER kept asking and asking, and the people gave her many ideas for ways to find the big pot of gold.

CRINKER thanked everybody and said ...

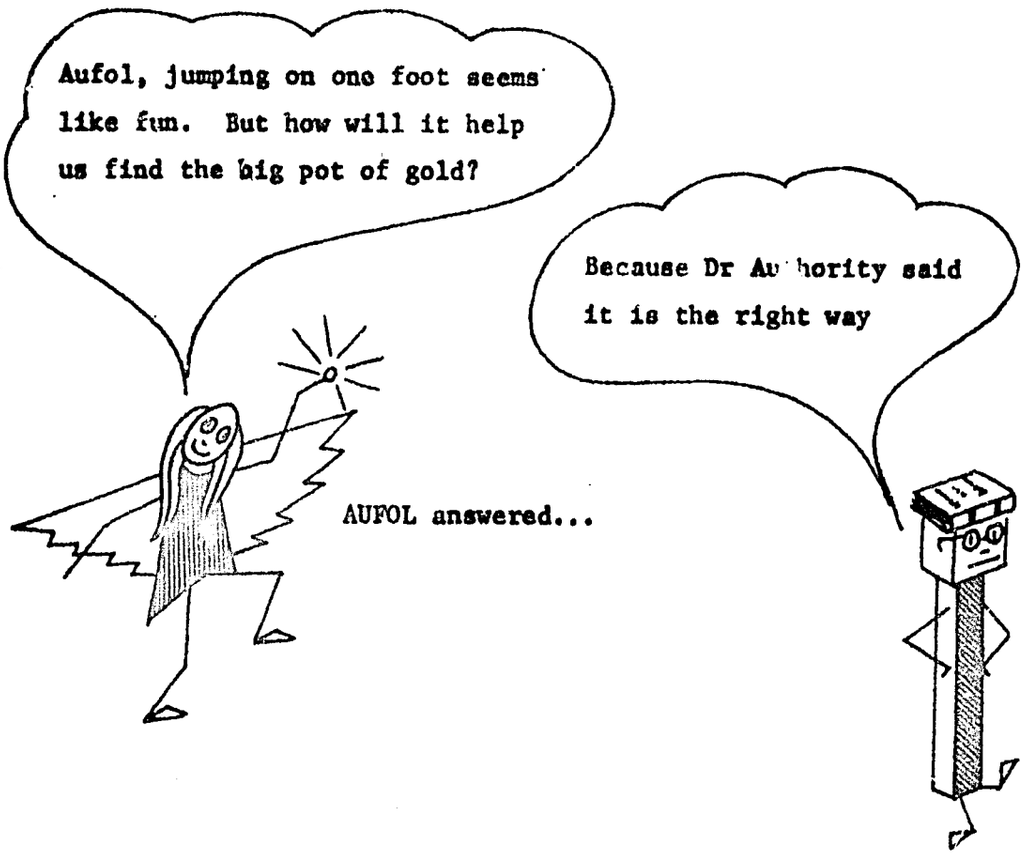
She returned to where AUFOL was still sitting reading Dr. Authority. She asked AUFOL the same question that she asked the other people....

AUFOL stood up and said ...



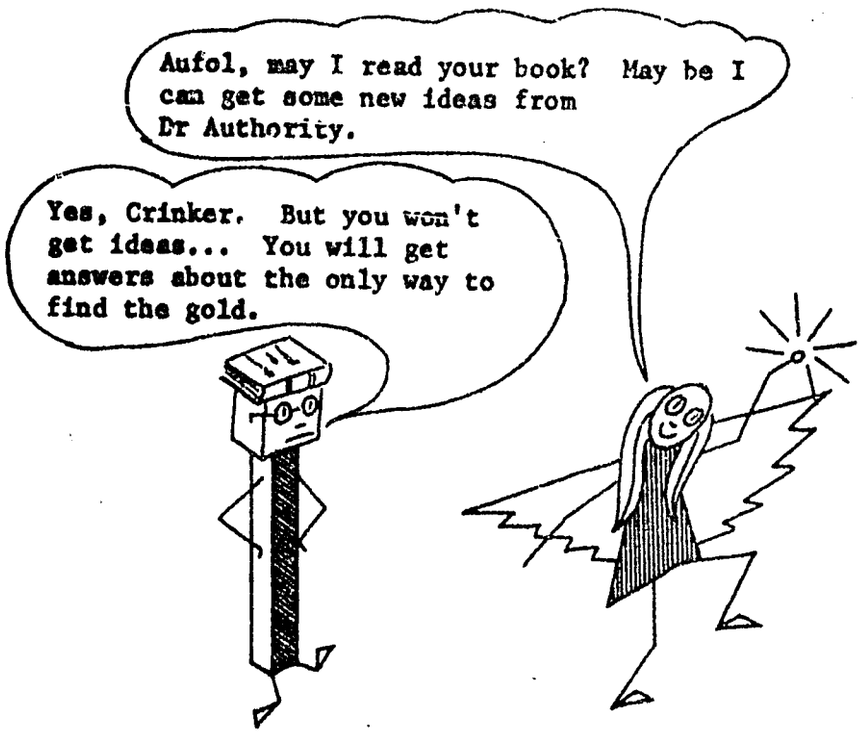
AND HE DID. HE JUMPED ON ONE FOOT.

CRINKER also was jumping on one foot, and said to AUFOL ....

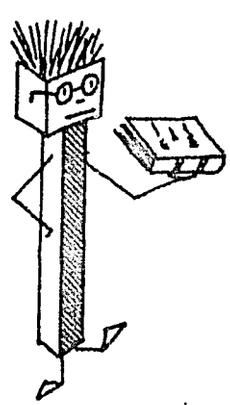


AUFOL answered...

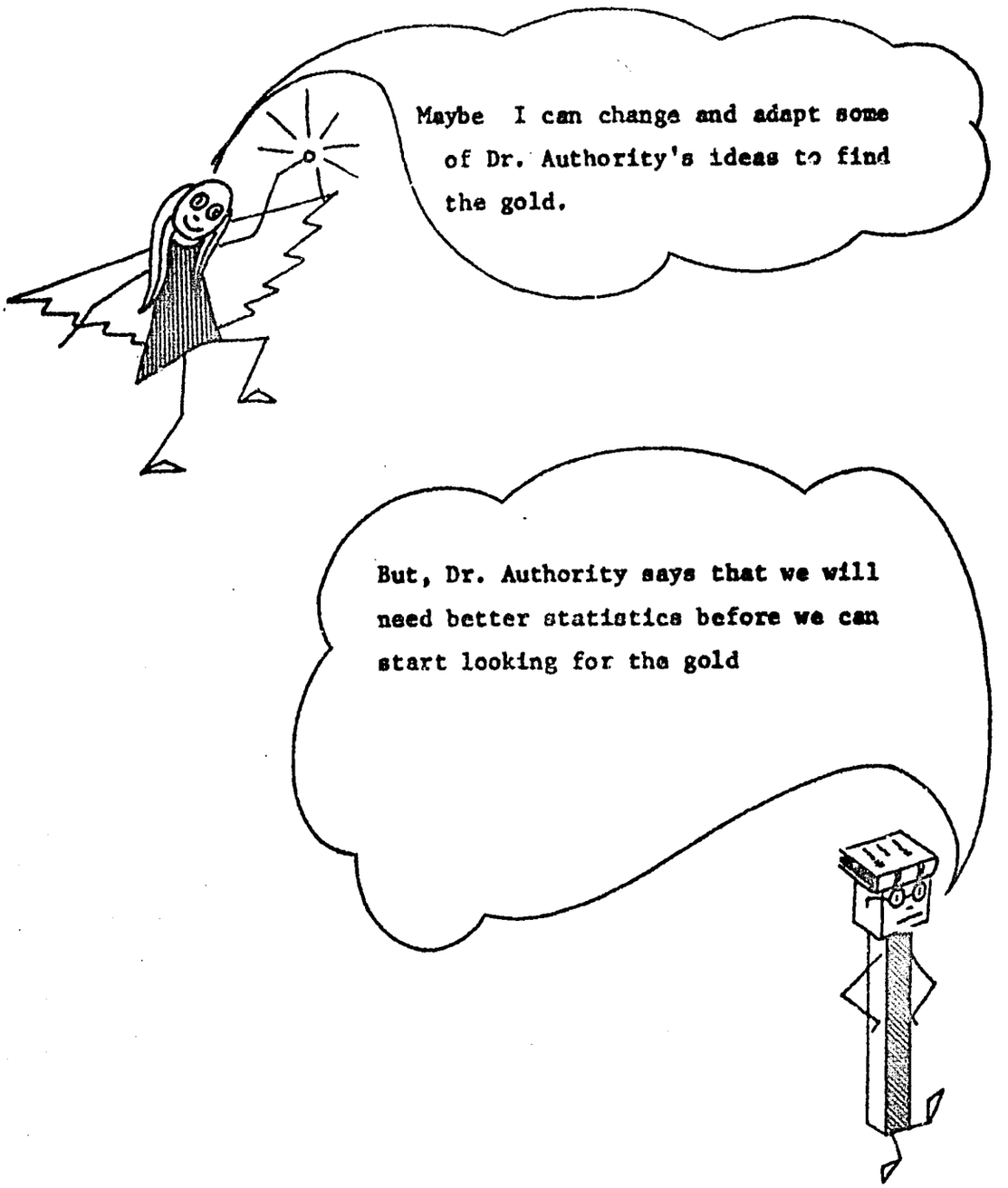
So they jumped ... and jumped ... and jumped.



AUFOL gave CRINKER his book. She had to turn her head so that AUFOL would not see her laughing ... but she had never seen him without a book on his head and had never seen his hair before.

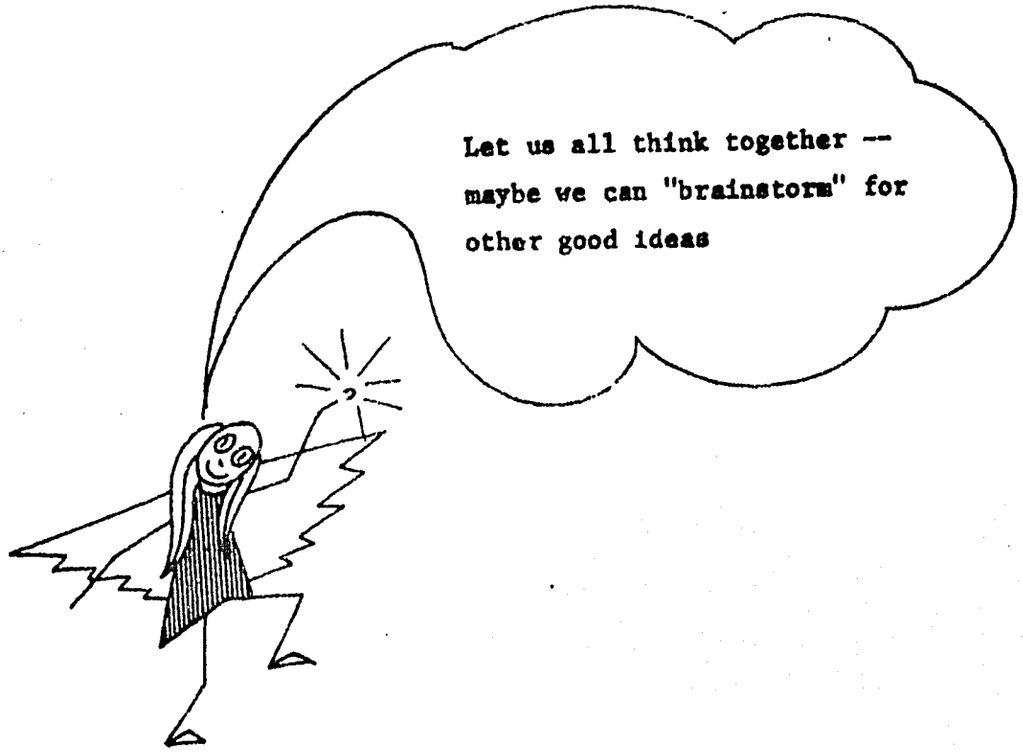


CRINKER read the Dr. Authority book and got some good ideas for finding the pot of gold. None of the ideas were exactly right, but she thought about them and said:

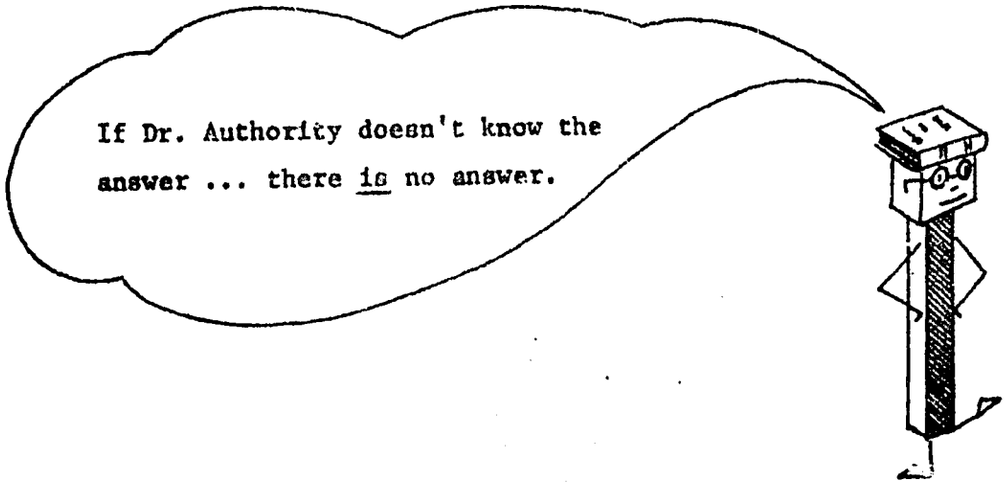


Said AUFOL, still jumping on one foot.

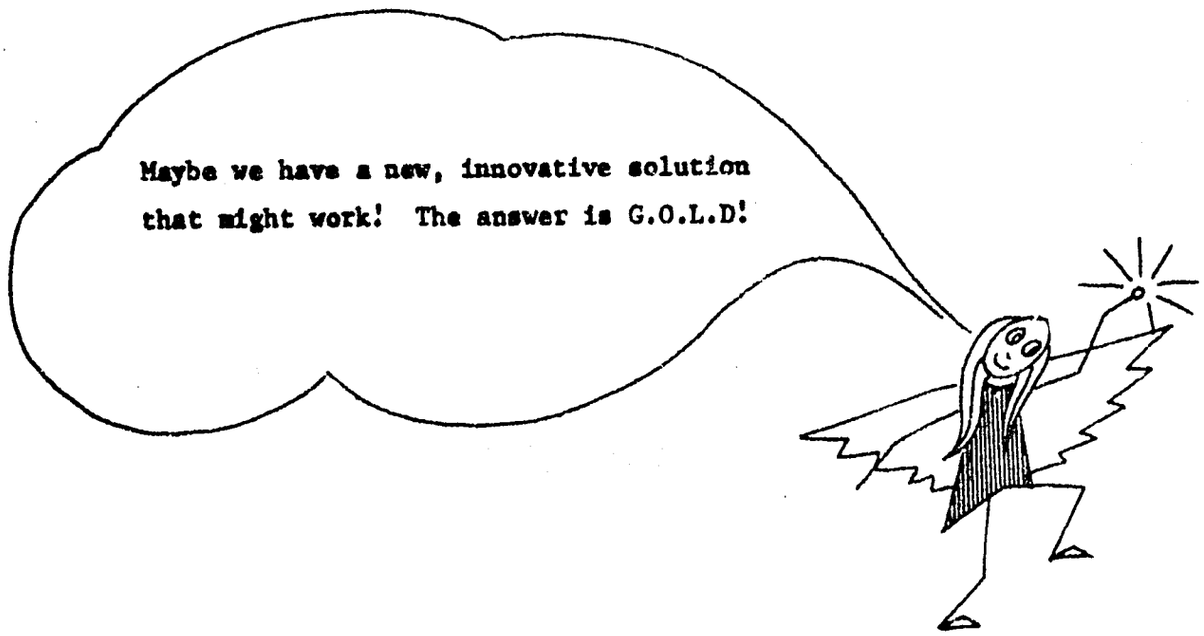
So CRINKER read some more books, talked to some more people, and she got some pretty good ideas about how to find the gold. But, first she decided to tell everybody ...



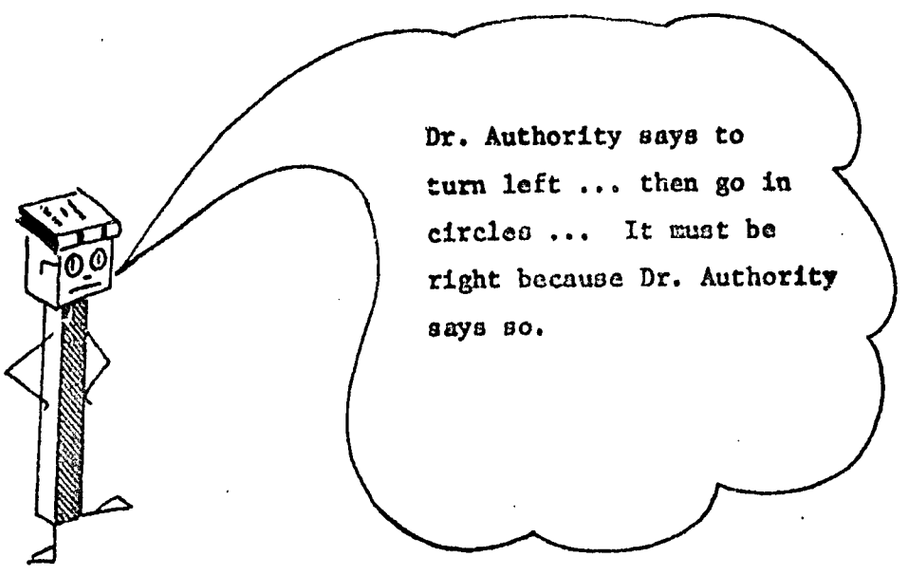
While AUFOL kept jumping on one foot, saying ...



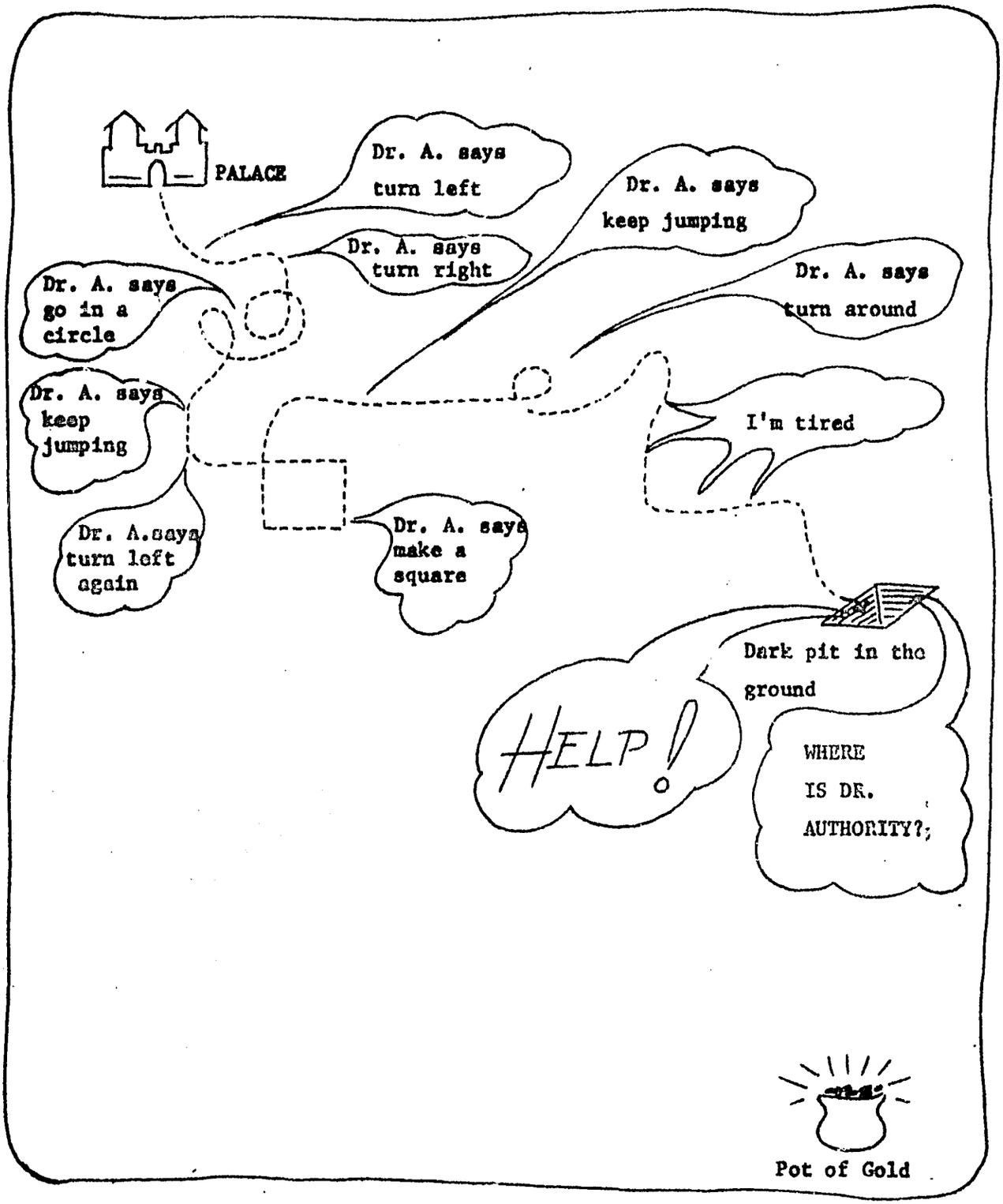
CRINKER now had many good ideas, she thought about them all ... changing and adapting ... till at last ...



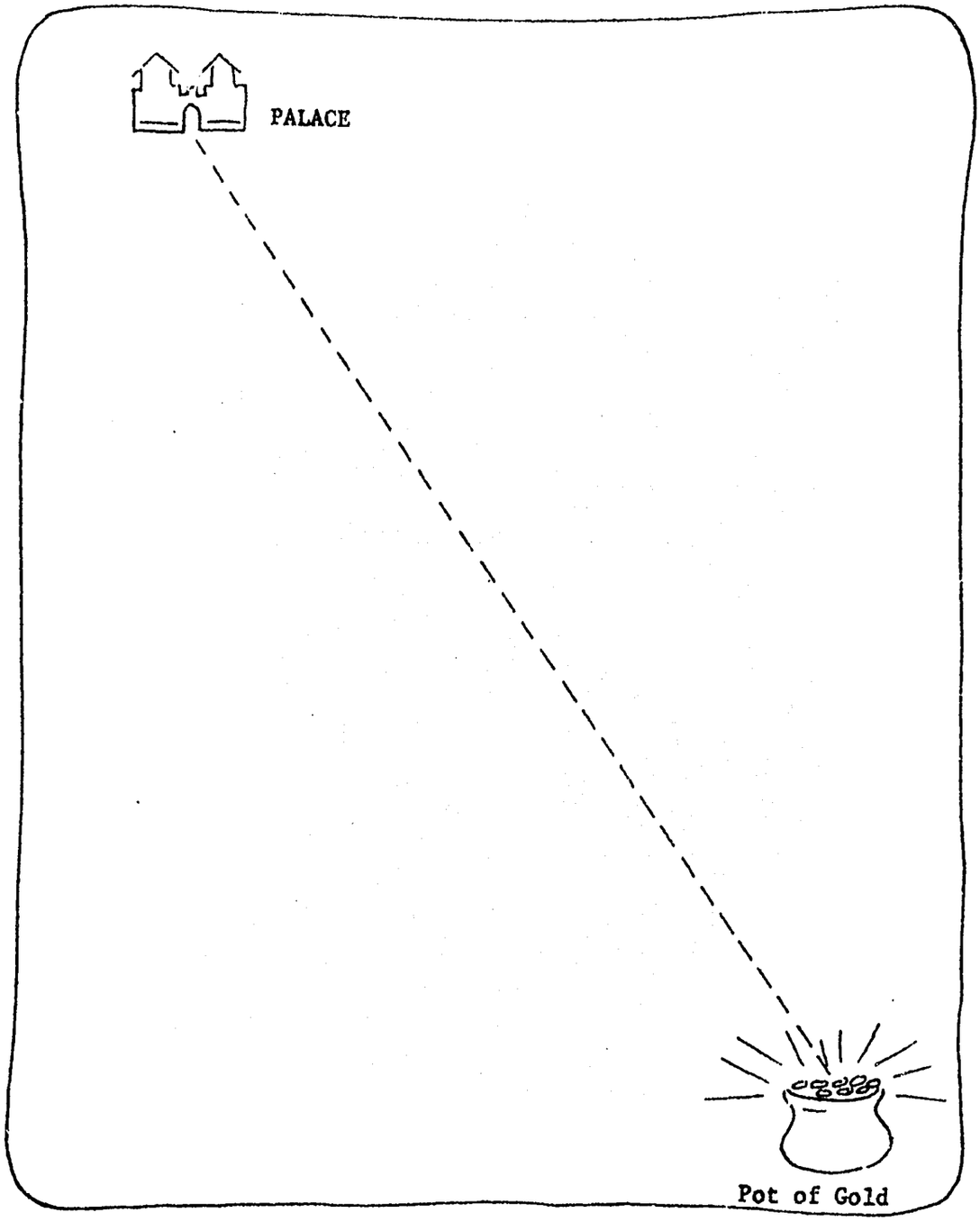
While AUFOL started following the directions in Dr. Authority's book ... and he still jumped on one foot ...



AUFOL followed Dr. Authority ... jumping on one foot as he looked for the big pot of gold. Here is the map of his search. You can hear him talking:

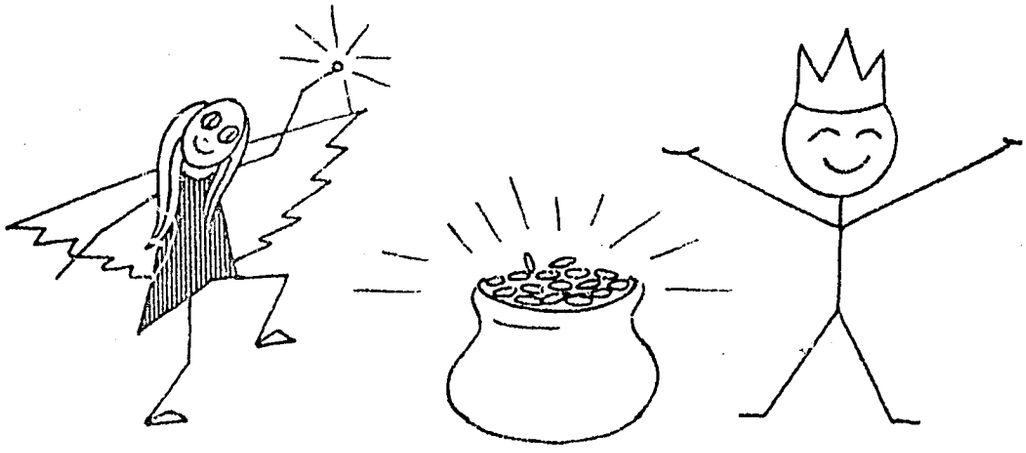


CRINKER's solution was G.O.L.D! It meant Go Onward Looking in the Distance. So she tried it, and it worked. Here is CRINKER's map:



If G.O.L.D. hadn't worked, CRINKER had many other creative alternatives she could try. Poor AUFOL could only follow Dr. Authority.

CRINKER brought the big pot of gold back to the King.



The King was happy. And all the people were happy because they would not be poor. They would all have gold.

SELF EVALUATION

1. What is the moral of the Golden Story? (Mark one).

   ◯ Don't read books.

   ◯ CRINKER could fly better than AUFOL.

   ◯ Gold makes everybody happy.

   ◯ AUFOL wore a book on his head because his hair was too long.

   ◯ Creative ideas can come from many sources, not only from authorities.

2. What is CRINKER's full name?

   CR _ _ _ _ _ _ _ _ _ _ _ _ INKER

3. What is AUFOL's full name?

   AU _ _ _ _ _ _ _ _ _ _ _ _ FOL _ _ _ _ _ _ .

FEEDBACK

1. (V) Creative ideas can come from many sources, not only from authorities. (A creative thinker gets as many possible alternative ideas as possible and changes and adapts them to achieve the objectives. Creative thinkers, by the way, also read books by authorities ... but they think about the ideas in the books as ideas, not as the only possible ways to get things done.)

2. CRINKER's full name is: CREATIVE THINKER

3. AUFOL's full name is: AUTHORITY FOLLOWER

We suggest that when you hear one of your fellow participants quoting an authority without giving his or her own opinion and reason ... You should call your colleague "AUFOL" (pronounced "Awful").

We also suggest that when you hear one of your fellow participants giving creative ideas of his or her own ... you should call your colleague "CRINKER" ... And then you should smile the way the King smiled.

MODULE 20

POST MODULE PRACTICUM

SMILE ALL DAY!

SERIES 5

MODULE 21

"What Have Others Done About Things Like This"

INNOTECH

Module 21

PREVIEW: Module 20 provided us with some interesting exercises designed to limber up our minds and free them from assumptions that will limit the number of possible alternative solutions to a problem. In this Module, we deal with another aspect of the generation of alternatives: determining what has been done to achieve similar objectives elsewhere, and considering the views of knowledgeable people on problems like this. This Module is therefore essentially a research activity.

OBJECTIVES: At the end of this Module, each participant should be able to:

(1) Describe at least one innovation, experiment, or project that has been initiated in other countries to solve problems similar to his national and on-the-job problem.

(2) Explain the implications of the innovation or project described to his own national and on-the-job problem.

(3) Briefly summarize portions of articles and other publications that give views and ideas pertinent to his national and on-the-job problem.

<u>Core Instructional Activities</u>. Follow this sequence of activities:

1. Do research in the library on your on-the-job problem, consulting with the librarian for sources of articles, research reports, innovations, projects or studies. Write a brief description of such articles, research reports, innovations, projects or studies that have bearing on your on-the-job problem and add a short paragraph about its relevance to the same.

2. Discuss your findings with your country team to get their views. Their comments are additional sources of information and include such ideas to enrich the innovative solution to your on-the-job problem. Then finalize your paper on your on-the-job problem. Following is a suggested format:

I. Statement of the Problem:

II. Brief description of studies, research reports, projects, innovations, etc. that have bearing on the problem.

3. Work on your national problem as a country team. Discuss how you will do library research with the rest of the group. When all members of your country group have completed their research activities, meet together and consolidate your notes on innovations pertaining to your national problem. Analyze the information you have gathered and synthesize the relevant ideas into at least one possible solution. Describe the solution briefly and use the format suggested earlier. If there are no innovations that you have read treating the same topic as yours, study other innovations dealing with other topics, the approach of which could be applied to your problem. Example - "Problem: There is a need for non-formal education in country X."

In your library research you cannot find any reported innovation in non-formal education. However, you read an innovation in population education, the approach of which can be applied to non-formal education. Describe the report and state its applicability to non-formal education.

Good Luck!

SERIES 5

MODULE 22

SEMINAR ON GENERATING ALTERNATIVES

INNOTECH

MODULE 22

PREVIEW

Module 21 dealt with one source of innovative ideas to solve educational problems VIZ the opinion of experts and the experiences of other people in other countries facing similar problems. In this module, we apply a particularly effective technique for generating the greatest possible number of innovative ideas -- brainstorming. We will apply this technique in generating solutions to our national and on-the-job problems.

OBJECTIVES

Each participant shall take active part in a "brainstorming" session during which he shall

(1) Learn the brainstorming technique of generating ideas to solve problems, and

(2) generate at least four (4) innovative ideas to every problem brainstormed

CORE INSTRUCTIONAL ACTIVITIES

1. Follow the directions specified in the different "tasks" stated in the following pages. When you are through, give the list of brainstormed solutions to the country group concerned and Number of Contributions by each member made by all members of the team to a member of the training staff.

2. Then meet with the members of your country team and following the same procedures conduct 30-minute brainstorming sessions for <u>each</u> of your respective individual problems.

"BRAINSTORMING" SOLUTIONS TO EDUCATIONAL PROBLEMS

COMPLETE EACH OF THE FOLLOWING TASKS:

TASK (A): Read the description of "brainstorming" below:

"Brainstorming" is an excellent means for generating new ideas. Basically, brainstorming is a group discussion, but it is far more open than most discussions. It is open because everyone in the group contributes original ideas without giving much thought or criticism of them. Each person strives for new ideas ... new approaches ... different ways of looking at an issue ... unique concepts ... crazy solutions ... etc and etc.

During a brainstorming session, one should not be critical of either our own or others' ideas. Ideas should simply flow, and our own thinking should be stimulated by the contributions of others. The reason for this is that criticism will turn off this essential flow of ideas. We can be critical and more realistic at a later time after we have had the fun generating as many innovative and unusual ideas as we can.

TASK (B): You will be a member of one brainstorming team. There are four brainstorming teams formed; each team being made up of participants from different countries so as to have as many different viewpoints as possible.

Get a copy of the list of members for each team from the Training Office (if you don't have it yet) and meet with your team to prepare yourselves for "brainstorming".

TASK (C): Select one team member to tally how many contributions (ideas or whatever) are made by each member on sheet "A". Each time someone says <u>anything</u> that is different, make a mark in the box beside his name. Remember, each team member should contribute as many solutions as he can.

Example: The sheet would look like this:

TEAM MEMBER	NUMBER CONTRIBUTIONS
Miss SALLY NAVARRO	| (ONE CONTRIBUTION)
Mr. HAMDI RASJID	|| (TWO CONTRIBUTIONS)
Mr. PHAN VAN HO	卌 (FOUR)
Mr. LEE SU CHOW	卌 | (SIX)
Miss MALINEE MANETAVAT	卌 卌 (NINE)

TASK (D): Select another team member to record each new idea on sheets "B". One or two lines are enough. Use extra scratch paper or the back of the sheets if you need more space.

TASK (E): Follow the "brainstorming" schedule below:

TEAM I	will brainstorm solutions to the national problems of Laos, Thailand, Malaysia, and the Philippines.
TEAM II	will brainstorm solutions to the problems of the Khmer Republic, Vietnam, Laos, and Singapore.
TEAM III	will brainstorm solutions to the problems of Indonesia, Philippines, Vietnam, and Khmer Republic
TEAM IV	will brainstorm solutions to the problems of Singapore, Malaysia, Indonesia, and Thailand.

Begin with one of the national problems (see sheets "B"). Have one of the country team members explain their country's problem to the other team members. For example, in Team I, one Lao team member explains the Lao national problem to other team members. Then, all members brainstorm solutions to that problem. Think free -- think different -- think innovative. Everyone participates. No one criticises. Have fun! Do not ask anyone or the staff to suggest ideas to you. Do it yourselves, and please -- please don't by shy. Many times the sillier the idea, the better.

A

BRAINSTORMING FOR INNOVATIVE SOLUTIONS

MAXIMUM NUMBERS OF CONTRIBUTIONS
BY ALL MEMBERS OF TEAM TO _____
NATIONAL PROBLEM

TEAM MEMBER	NUMBER CONTRIBUTIONS

B

BRAINSTORMING FOR INNOVATIVE SOLUTIONS

MAXIMUM NUMBER OF IDEAS FOR INNOVATIVE SOLUTIONS TO _____ NATIONAL PROBLEM

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

When you finish brainstorming solutions to the first national problem, repeat the entire process for the next national problem until four national problems have been brainstormed. Spend approximately one hour on each problem.

After this, each country group will constitute themselves into a brainstorming team to brainstorm on their on-the-job problems, devoting approximately one-half hour for each on-the-job problem. (Copies of Sheets A and B may be secured from the Training Office for this purpose).

SERIES 5

MODULE 23

ANALYSIS, SELECTION AND MODIFICATION OF ALTERNATIVES

INNOTECH

MODULE 23

PREVIEW

In the previous three modules you have attempted to develop a number of innovative solutions to your national problem and to your on-the-job problem. We hope that the brainstorming sessions of the last module have given you some refreshing and creative ideas for solving your problems.

The present module will start with the results of your brainstorming ideas. We will attempt to help you to analyze them and to select and modify the most promising. At the end of this module, you should be able to describe in some detail the one alternative that has the greatest potential for achieving your objective.

OBJECTIVE

Analyze all alternatives and select and modify the one alternative with the most promise for achieving your objective, primarily through the maximum utilization of resources and the overcoming of constraints.

CORE INSTRUCTIONAL ACTIVITIES

For your National Problem, follow the steps outlined in Part I of the module. Work together with colleagues from your own country.

For your On-The-Job Problem, follow the steps outlined in Part II.

In either Part of this module, you are encouraged to consult with other participants and with the training staff.

In many ways, what you do in this module is of greatest importance to achieving the objectives of your national and on-the-job problems. Take as much time as you need to do a thorough job of analysis, selection and modification.

There is no post-module practicum; the complete module is a practicum. It is also hard work. The training staff wishes you good luck, and we stand ready to help you in any way we can.

PART I

Analysis, Selection and Modification of Alternatives (National Problem)

A step-wise procedure is given below to help you arrive at the most promising solution to your National Problem:

Step 1. Join your colleagues in reviewing all brainstormed ideas and in selecting the 16 most promising alternatives.

Step 2. Describe each of the 16 alternatives in a short paragraph.

Step 3. Analyze and modify the 16 alternatives primarily in terms of their potential to overcome constraints and utilize resources. Select the 4 most promising alternatives (or modifications).

Step 4. Write a complete description of each of the 4 alternatives (Each member of your country team can write one.)

Step 5. Evaluate and modify the 4 alternatives, using the Instrument to Evaluate Innovations (IEI). Select and modify the one most promising alternative.

X X X X X X X X X X

PROCEDURES

Step 1. Select the 16 most promising ideas
(Ask the Training Office for 100 blank cards)

Take all of the ideas from your brainstorming sessions, and write each one on a separate card. Sort or classify the cards into different groups representing different kinds of approaches. Use whatever grouping that your country team feels to be best ... use your own judgment. Also, if you want to change any ideas or to add new ones, please do so.

In selecting a final set of 16 ideas, apply the following three criteria:

a) The 16 ideas should represent a wide variety of different approaches.

b) Each of the 16 ideas seem to hold some promise for achieving your national objective.

c) Each of the 16 ideas would seem to best overcome constraints and utilize resources.
(Refer to your own list of resources and constraints which you prepared in Module 19.)

Step 2. Describe each of the 16 alternatives

The purpose of these descriptions will be to clarify the ideas in your own minds so that a more systematic selection can be made in Step 3. All that is needed is a short paragraph on each alternative. In writing the paragraph, think about

... who will be doing what?

... how will materials or equipment be used?

... etc.

Make sure that the main idea of the alternative is clear. (Since there are to be 16 alternatives, each member of the country team may want to write 4.) Change the ideas if you want through discussions of the country teams. Keep in mind your resources and constraints in any changes you make.

Step 3. Select and modify the 4 most promising alternatives

Country team discussions should concern (1) Which alternatives would seem to be best able to achieve the national objective? (2) Which alternatives best satisfy resources and constraints? and (3) What changes should be made to them to make them more able to achieve the objective and to satisfy resources and constraints.

Go very carefully through your resources and constraints which you prepared in Module 19. Modify your alternatives so that they will best satisfy resources and constraints. Select the four most promising alternatives ... after modification.

Step 4. Write a complete description of each of the 4 alternatives.
(Ask the Training Office for Project Description forms)

In Module 9, we prepared descriptions of innovations in SEAMEO countries. In this module, we will use the same format (leaving out the portion on Progress/Status). The outline is as follows:

A. Title (Use your our title)

B. Problem (your National Problem)

C. Main Idea (Use ... or modify ... your one paragraph descriptions from Step 2.)

D. Description

1. Objective (your National Objective)

2. Methods and Content (Give all necessary detail about the alternative.)

(Please refer to Module 9 for more detail.)

Step 5. Select and modify the one most promising alternative
(Ask the Training Office for four copies of the IEI and two copies of the Project Description forms.)

In Module 7 through 9 you used the Instrument to Evaluate Innovations (IEI) to adapt innovations for use in your own country. It is a time-consuming process ... but a very necessary one if you are going to develop an alternative to achieve your objective.

As a country team, review the instructions for using the IEI and apply it to each of the four alternatives. Modify and adapt the alternatives as much as needed to satisfy the questions in the IEI... paying particular attention to those items you have judged to be critical, i.e., those checks you have circled in the IEI ... .

Once you have modified and adapted each of the four alternatives as much as possible, review each one and decide which is now the best for achieving your objective. (You may end up with two "bests" if you cannot identify only one.)

Now, rewrite the Project Description of the one (or two) alternative(s) you have selected, incorporating all the adaptations you made in the IEI. This Description is your final product.

PART II

Analysis, Selection and Modification of Alternatives (On-The-Job Problem)

A simplified set of steps will be used for your On-The-Job Problem:

Step 1. Review and select the three most promising alternatives to achieve your on-the-job objective.

Step 2. Write a complete description of the three alternatives

Step 3. Select and Modify the one most promising alternative

X X X X X X X X

Step 1. Review and select the three most promising alternatives

Using the list of resources and constraints which you prepared in Module 19 (for your on-the-job problem), review the ideas resulting from your brainstorming sessions. Modify or adapt ideas ... expand on some ... add new ones ... so that they will best meet your resources and constraints and select three that in your mind best ...

... meet resources and constraints, and

... seem most able to achieve your objective.

Step 2. Write a complete description of the three alternatives
(Ask the Training Office for copies of the Project Description form)

Complete a Project Description form for each of the three selected alternatives. The procedure is the same as Step 4 of your National Problem. Consider your list of resources and constraints as you write the description ... modify or adapt each alternative as you think of ways to use resources and overcome constraints.

Step 3. Select and modify the most promising alternative
(Ask the Training Office for an IEI form.)

Use the IEI to change/adapt each of the alternatives. (Don't forget to add questions to the IEI that will best fit your objective or alternatives.)

Review IEI results and select the one alternative that can best achieve your objective.

Rewrite your alternative on the Project Description form, including all changes suggested during your IEI evaluation. This Description is your final product.

There is no Post-Module Practicum.

MODULE 23 (APPENDIX)

On the following three pages is a copy of the Project Description Form for use in this module. Additional copies can be obtained from the Training Office.

PROJECT DESCRIPTION

A. TITLE	
B. PROBLEM	

C. MAIN IDEA	

D. DESCRIPTION	(1) Objective(s):
	(2) Methods and Content:

SERIES 5

MODULE 24

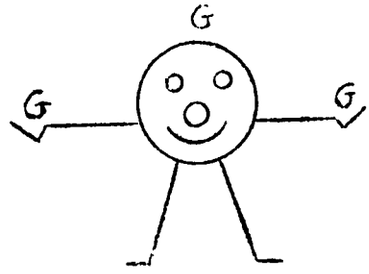
SPECIFIC OBJECTIVES

INNOTECH

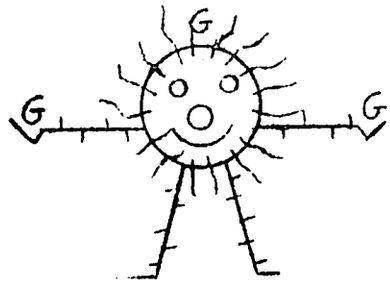
MODULE 24

PREVIEW

In Module 18 we met General Objectives.



One of the main points of that module was to state objectives clearly and to avoid "fuzzies". This is a fuzzy.



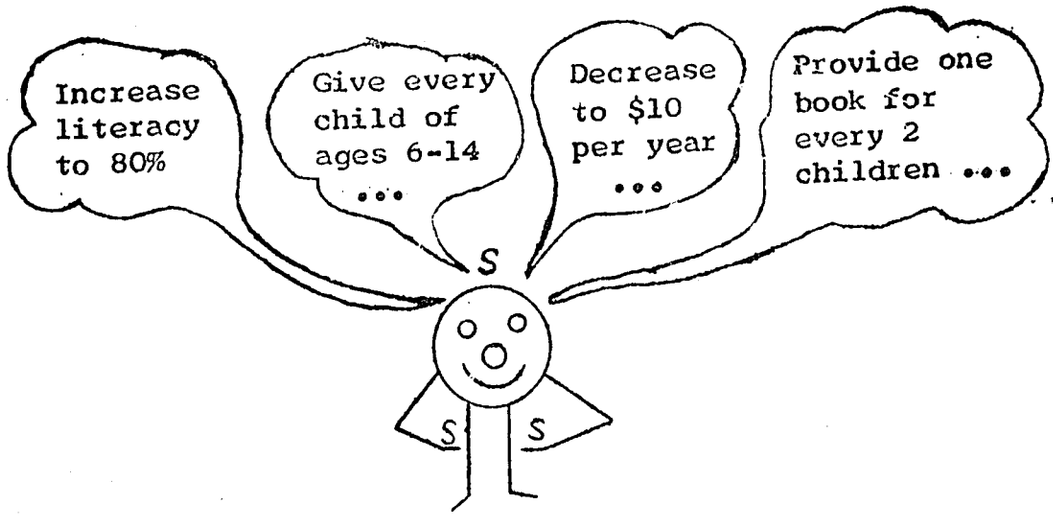
And we learnd that one of the best ways to avoid fuzzies was to state objectives clearly, and, if necessary, to give many specific examples.

Our work on resources and constraints and on generating alternatives was in relation to General Objectives. General Objectives typically use such words as: "Increase" "decrease" "give" "provide", etc. But they do not say how much to "increase", how much to "decrease", how much to "give or how much to "provide".

The reason that they are unable to say "how much" is that we did not know enough about resources and constraints or about "how much" the possible alternatives could possibly "increase", "decrease", "give", provide", etc.

However, in the last module, we were able to arrive at the best possible alternative, and we are now in a much better position to say "how much". And in saying "how much" we can state Specific Objectives. Remember?

And Specific Objectives say such things as:



Specific Objectives are important because they give us specific targets to achieve. They are also important because they are measurable ... so that we can measure whether or not we are achieving our objective.

OBJECTIVE

Write specific and measurable objectives.

CORE INSTRUCTIONAL ACTIVITIES

Complete the module, performing self-evaluation exercises. Check the results of each self-evaluation with the feedback sheets only after completing the self-evaluation.

Perform the Post Module Practicum after completing the module.

Please check with the Training Staff if you require assistance.

PART I

SPECIFIC MEASURABLE OBJECTIVES FOR EDUCATIONAL PROGRAMS
- Adapted from an original article by Dr. Jerry Short -

Not long ago, a reporter interviewed the director of one of the world's most successful family planning and population control program. In the interview, the reporter asked the director about the main objective of the program.

The director answered, "Well, I would say that the main objective is to increase family planning concepts at all levels in the country". This objective, as you now recognize, was a fuzzy.

Such main objectives are useful starting points for planning educational programs. But they are no more than starting points. Before good educational programs can be designed and carried out, they must be converted into specific objectives.

Since the reporter realized the need for specific objectives, he continued his interview by asking the director to describe the objective in more detail. The director answered, "Well, during the first five-years of our family planning program, our objective is to contact 60% of the women in the target age group from 15 to 45 years old".

This answer is more specific. It limits the objective to a five-year period and specifies the target group. But it is still not specific enough. The objective still does not give a clear picture of what the program is attempting to do. More importantly, we still do not know how to tell if the program is successful or not. In his answer, the director said, "Our objective is to contact 60% of the women in the target age group from 15 to 45 years old". But it is not clear what the director means by the word contact. He could mean two very different things. On the one hand, he could mean that women know the meaning of the term "family planning". On the other hand, he could mean that women are actively participating in family planning programs. There is a great difference in these two interpretations.

Although the director gave a more specific objective the second time than he did at first, he still did not give a measurable objective. So the reporter asked another question. "What exactly do you mean when you say your objective is to contact people"?

"Well, to be specific", the director answered, "I mean two things. First, I mean that someone has visited one of our clinics or hospitals and had an individual interview with a nurse or case worker about family planning. In other words, our objective is to interview 60% of the target population during the next five years. But interviews are not enough. We want to achieve a high acceptance rate of family planning practices among the women we interview. We want three-fourths of the people we interview to accept family planning procedures. Acceptance means that they use some type of birth control procedure to limit their families to two or three children, preferably two, and that they continue to come to local clinics at least twice a year for consultation, checkups, and medication".

Now the objectives of the program are clear. They are stated so that the director can use them to measure the success of the program. The director can do this by comparing the actual progress made in the program with the specific objectives of the program. In this way, he can tell if enough people are being interviewed and if the interviews are successful in getting the desired rate of acceptance. If the program fails to meet its objectives, he can take immediate action to improve the program. In fact, during the first month of the program, the number of interviews was much lower than planned. The nurses often had no one to interview because few people voluntarity came to the family planning clinics. Immediately corrective action was taken to send the nurses where the people were: to community centers, factories, and homes. And a new program was begun to contact couples who had applied for marriage licences. By the end of the first year, this corrective action had produced the desired results and the program was meeting its objectives.

The interview about the family planning program illustrates what is meant by specific measurable objectives. A measurable objective describes something that can be observed. It describes the desired outcome of a program in such a way that most people can agree that the program is a success or a failure.

In the interview, the director and reporter began by discussing a vague overall goal, and then gradually converted it into a measurable objective. Here are the stages in their development of a measurable objective:

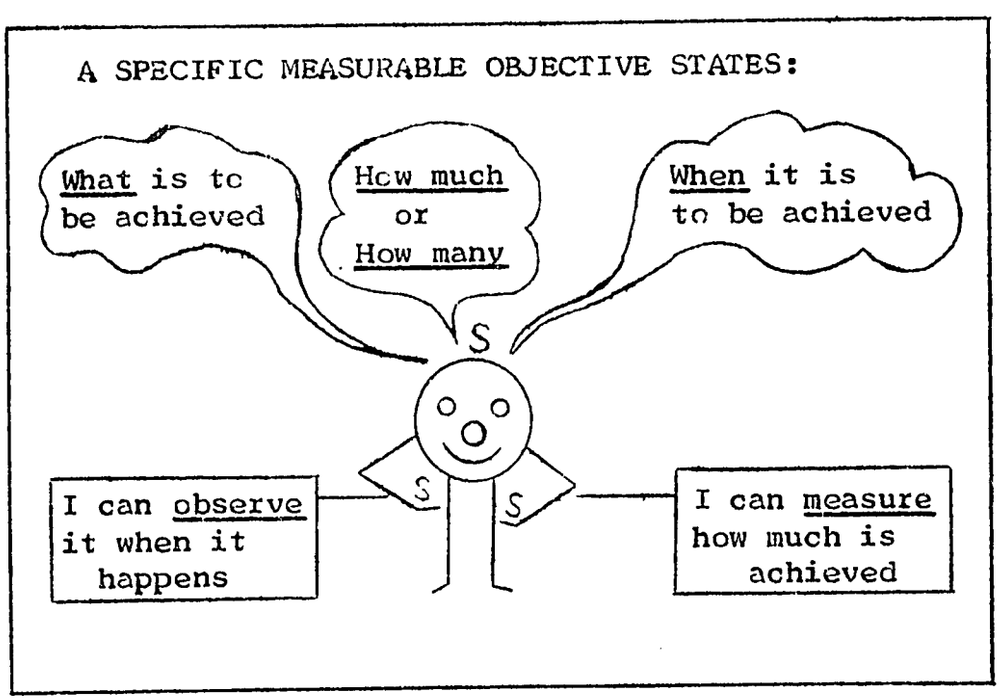
Increase family planning concepts at all levels in the country.

↓

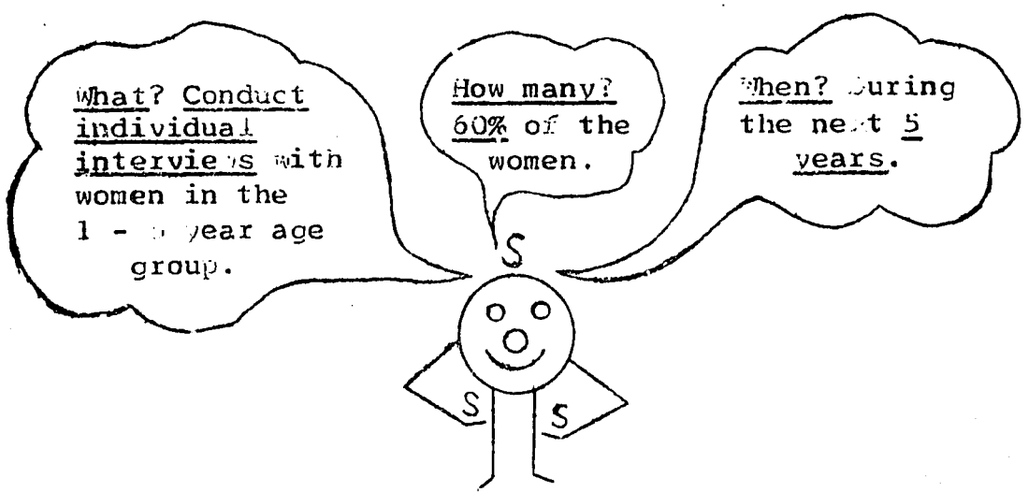
Contact 60% of the women in the age group from 15 to 45 years old during the next five years.

↓

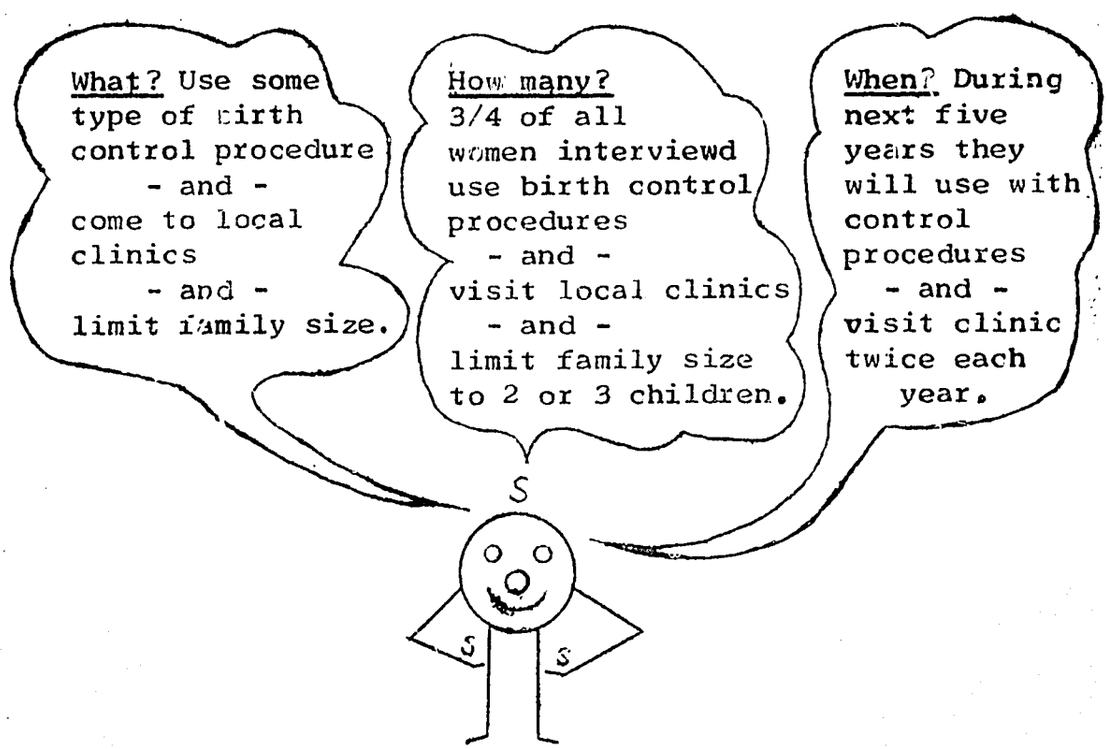
In the next five years conduct individual interviews about family planning with 60% of the women in the age group from 15 to 45. Get three-fourths of them to accept family planning procedures. Acceptance means that they use some type of birth control procedure to limit their families to two or three children - preferably two - and that they continue to come to local clinics at least twice a year for consultation, check-ups and medication.



THE SPECIFIC OBJECTIVE FOR FAMILY PLANNING STATES:



and



Let us review what probably went on in the mind of the Director of the family planning program.

First, he didn't state a good general objective when he said: "increase family planning concepts at all levels in the country".

A better general objective would have been:

"decrease family size throughout the country"

or

"decrease rate of population growth"

Second, why did he finally talk about interviewing 60 percent of all women between the ages of 15 and 45? Because he had decided upon the "best" alternative solution and had considered his resources and constraints. He had decided how best to decrease family size (by beginning with interviews of women in the 15-45 child-bearing age group) ... and he was aware that his staff and money resources would only permit him to interview 60 percent.

He knew what was probably the best alternative to achieve his general objective ... so he could be specific and realistic.

What if his Minister had said that 60% was too small ("increase that number to 75%) and that 5 years was too long a time ("shorten the time to 4 years")? What could the Director do?

He might be able to ask the Minister to change his resources and constraints. Because he had earlier determined the "best" alternative considering his resources and constraints. Perhaps, if his resources and constraints were changed he could then meet the Minister's objective. Or, he might be able to consider other alternatives which would be even better in meeting the new objective under changed resources and constraints.

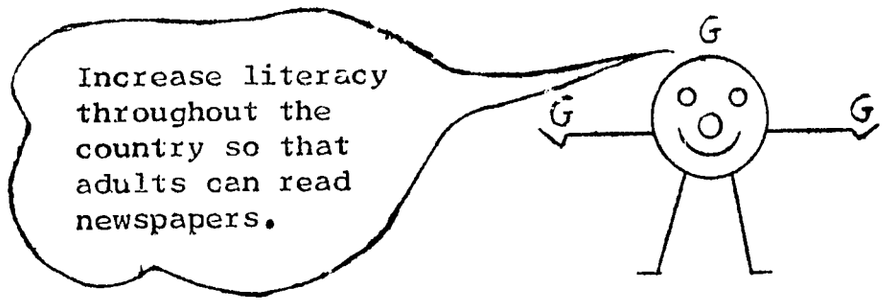
The above review shows how

... specific objectives can best be stated after a "best" alternative is determined, and

... how the feedback loop functions in the systems approach (feedback from alternatives back to objectives ... and ... feedback from objectives back to resources and constraints.)

SELF-EVALUATION (PART I)

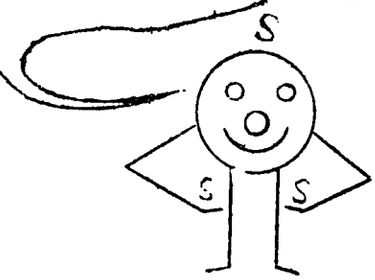
A. Rewrite this general objective to be a specific objective:



"BEST" ALTERNATIVE: Train all last-year secondary school students via self-instructional materials to teach one illiterate adult to read newspapers. Provide them with the necessary instructional materials. Last-year secondary school students are 4% of the total population. Each year, therefore, they should be able to teach literacy to 4% of the population.

- WRITE THE SPECIFIC OBJECTIVE BELOW -

Increase by _____ of the population _____
(How much?) (When?)
the number of illiterate adults who are able to
_____.
(What?)



FEEDBACK (A)

Increase by 4% of the population
(How much?)
each year the number of illiterate adults
(When?)
who are able to read newspapers.
(What?)

NOTE THAT WE DID NOT STATE HOW THE OBJECTIVE WAS GOING TO BE ACHIEVED. WE SAID NOTHING ABOUT SECONDARY SCHOOL STUDENTS BECAUSE THEY REPRESENT OUR METHOD (ALTERNATIVE) NOT OUR OBJECTIVE.

SELF-EVALUATION (PART I - Continued)

B. We should make the objective even more specific (and measurable) by stating what is meant by "read newspapers". What level of reading ability is adequate and how do we know when a person has achieved this level?

- ADD TO THE EXAMPLES BELOW -

After reading a newspaper, a person can tell you such things as:

1. Yesterday's temperature in the capital city.
2. When the President will return from Europe.
3. _____
4. _____
5. _____

etc. etc. etc.

The above are samples of a person's ability to "read newspapers". They provide us with specific sample measures of the achievement of our objective.

FEEDBACK (B)

After reading a newspaper, a person can tell you such things as:

1. Yesterday's temperature in the capital city.
2. When the President will return from Europe.
3. Price of 100 kilo of rice.
4. Score of Sunday's football game.
5. The opposition party's position on the new tax.
6. How to test for soil acidity.
7. The next movie at the Rex theater.

etc. etc. etc.

The above are samples of a person's ability to "read newspapers". They provide us with specific sample measures of the achievement of our objective.

PART II

Part II is in many ways a short review of many things that we have learned before. In early modules, we stressed the difference between problems and solutions. And we also have made sure to keep the method for achieving an objective out of the statement of the objective. (There will be no self-evaluation/ feedback on Part II).

Recognizing the Difference Between Specific Objectives and Methods and Materials.

The conversation below is between a Master-teacher and a Student-teacher.

MT: (Master-Teacher)	Let's work on the mathematics objectives for preschool students.
ST: (Student-Teacher)	OK.
MT:	What is your main objective in mathematics?
ST:	The main objective is to let the children play with many different objects and gain experience arranging them in sets of different numbers.

MT: That is not a specific objective. You described an educational method. You told me what the students will do during instruction. But an objective describes what the students will be able to do after the instruction is over. I want to know your specific objectives. Can you be more specific?

ST: Well, I'll teach number concepts this way. For example, I'll hold up a card with a picture of three dogs on it, and I'll say "Here are three dogs. Let's count them together".

MT: You are still describing a method of teaching number concepts. That is not what I want. An objective describes what a student does after he completes a lesson, not something a teacher does during the lesson. Before we talk about the way you plan to teach number concepts, I'd like to make sure I understand exactly what the students are supposed to learn.

ST: Well, they should learn number concepts from 1 to 10, the concept of sets and subsets, the distinction between numerals and numbers.

MT: No, that's not what I am talking about either. Now you are outlining the content and the subject matter. I'm not interested yet in (1) what you are going to teach, (2) how the student is going to learn it, or (3) what content you are going to cover. I want to know your objectives. What will a successful student be able to do when he finishes the preschool program?

ST: You have me completely confused. I've told you how I would teach number concepts; what the sutdents will do to practice number concepts; and the content I will cover. Don't you want to know any of that?

MT: Not yet. I want to get to methods, materials and content later. First, I want to know your objectives. Let me put it another way. Suppose a student walked in here right now. How would you find out if he knew number concepts.

ST: Ask him.

MT: Ask him what?

ST: Well, I would give him a lot of objects, like a lot of coins, and ask him to give me five of them, or eight of them, or seven ... Like that.

MT: Would you consider your preschool math program a success if all your students could do that when they were through?

ST: Yes.

MT: Well, now you've given me your specific objective. Now I know what you want your students to be able to do after they complete the program. That's what I mean by specific objectives.

ST: I think I see what you mean.

Why do we insist on specific measurable objectives?

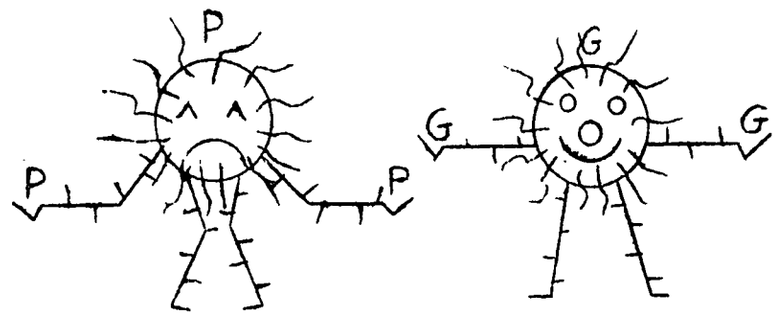
The key is in the Master-teacher's saying, "Now I know what you want your students to do after they complete the program".

We must be able to measure whether or not we are achieving our objectives. How else can we monitor and improve on our alternative to achieve our objective? Measurement provides feedback in the systems approach to improve our methods for achieving our objective.

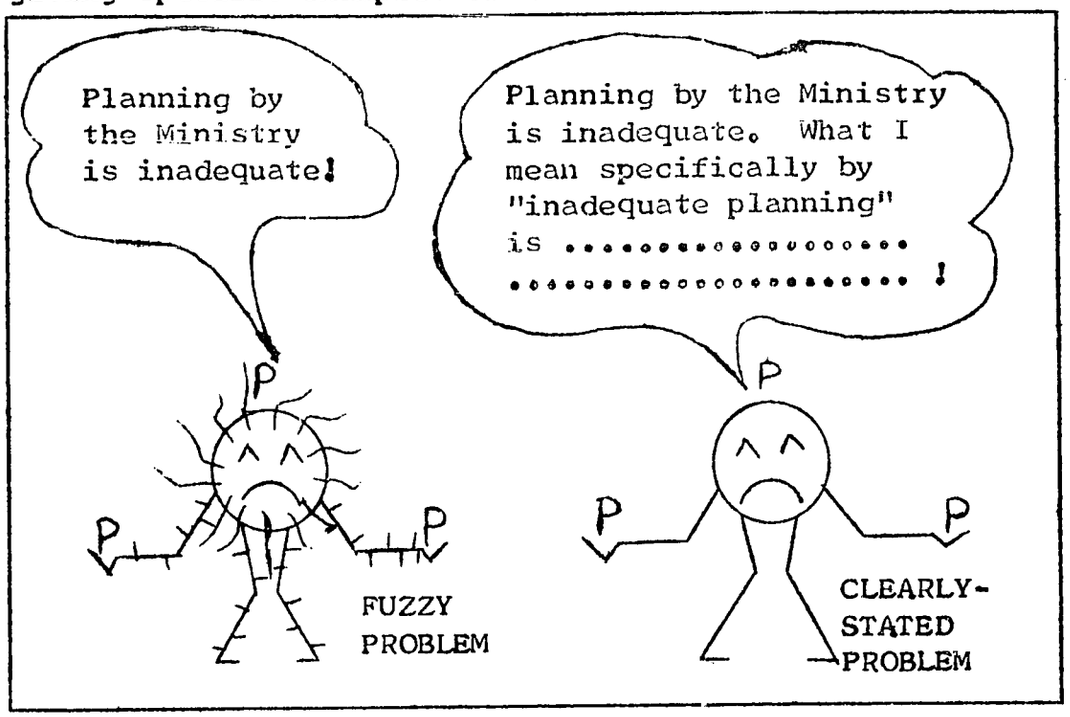
As part of the objective, therefore, we should state how we would expect to measure its achievement.

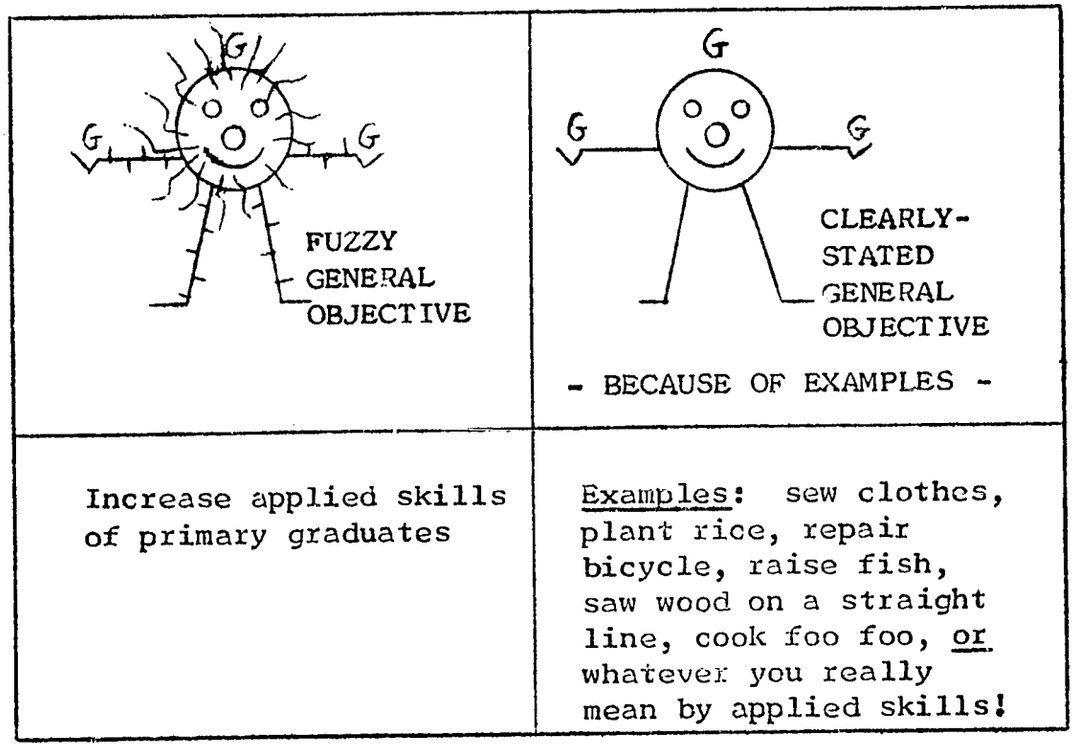
THERE IS NO SPECIFIC OBJECTIVE THAT CANNOT BE MEASURED.

Remember our fuzzies?

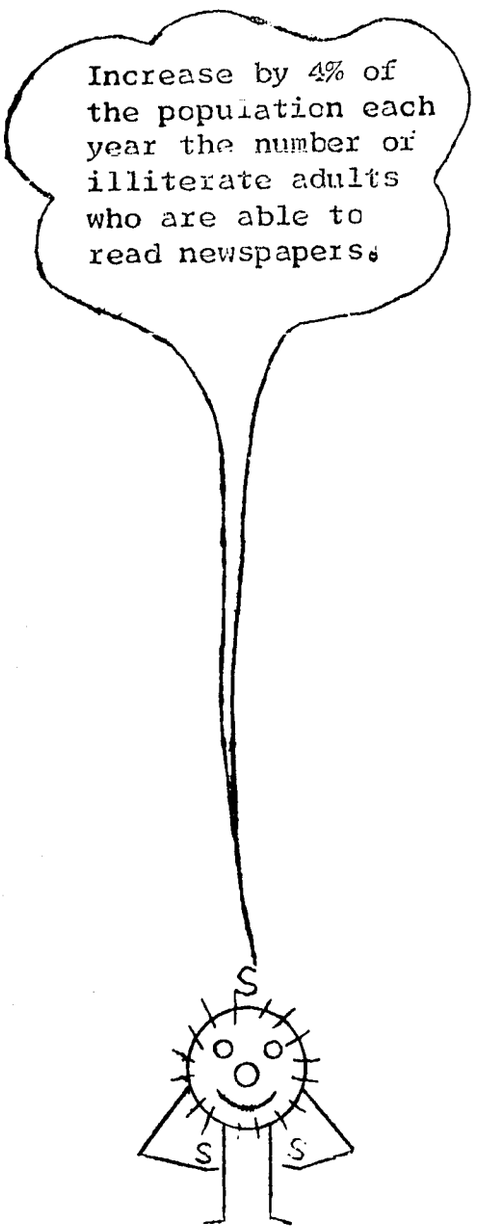


We were able to make them clearly-stated by giving specific examples of what we meant.

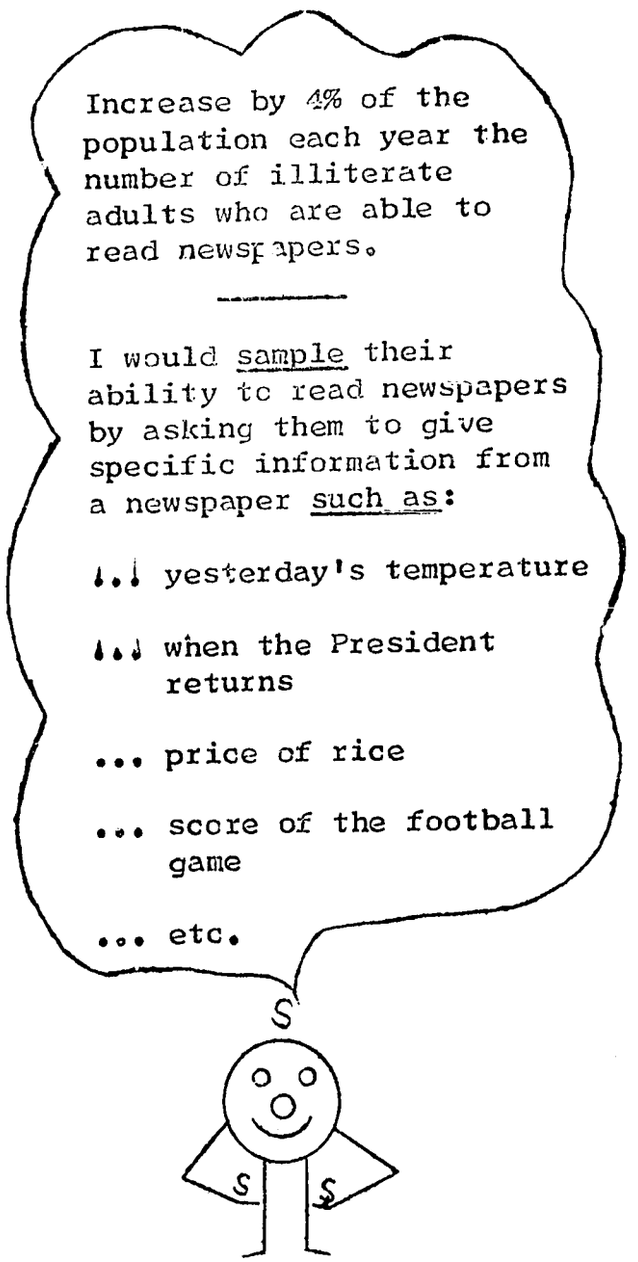




Even well-written Specific Objectives are a little fuzzy unless we state how we intend to measure their achievement.



Slightly fuzzy because it does not give measures.



Clearly-stated because it provides measures.

With the foregoing, we are done. But for review:

General Objectives are clearly-stated directions to go. We use words such as "increase", "decrease", "provide", "improve", etc.

Resources and Constraints are developed in relation to the General Objectives. "What are the resources that can be used, and what are the constraints that must be tolerated or overcome, in achieving the General Objective"?

Alternative Solutions are developed from a variety of sources and in a variety of creative ways. They are directed toward the achievement of the General Objective, and they maximize the use of resources and are able to either tolerate or overcome constraints.

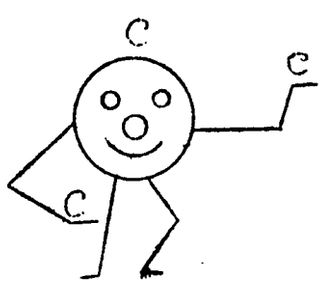
The "Best" Alternative Solution is selected and modified as the one which can best achieve the General Objective within the available Resources and Constraints.

Specific Objectives are written in terms of what the Best Alternative Solution can reasonably accomplish. If this achievement is judged by authorities to be insufficient, it will be up to them to adjust Resources and Constraints sufficiently to permit a higher level of achievement.

Specific Objectives state <u>What</u> is to be achieved, <u>How Much</u> (or How Many) is to be achieved and <u>When</u> it is to be achieved.

Specific Objectives must be accompanied by <u>Specific Examples</u> of what is to be achieved (when necessary) and by <u>Specific Measures</u> so that one can tell whether or not an objective is being achieved.

<u>CHANGE OBJECTIVES</u> were first mentioned in Module 18.

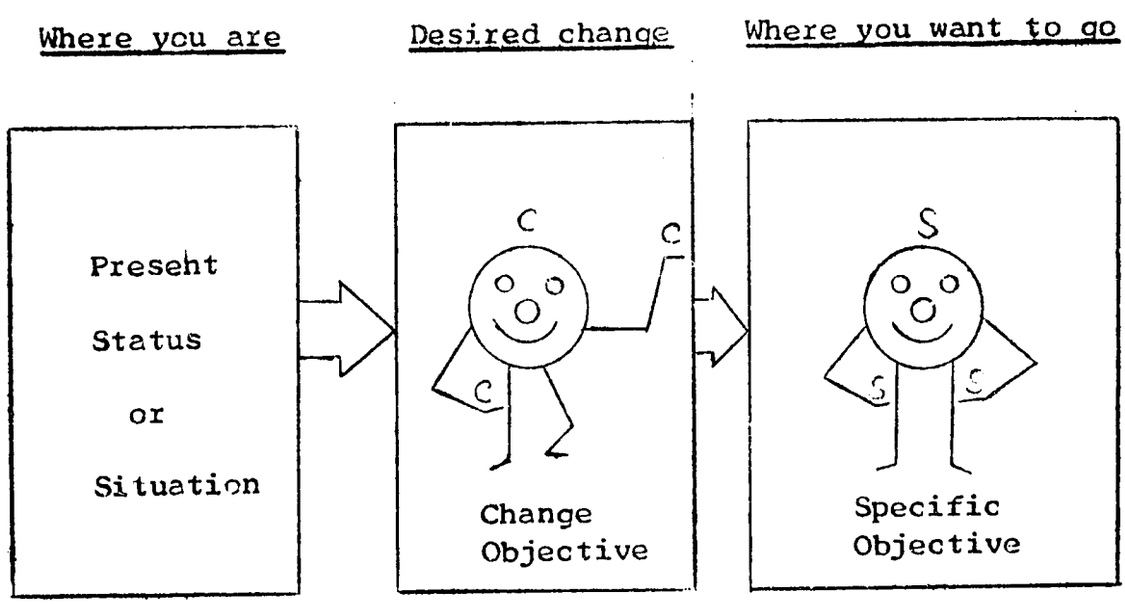


A "change" is the difference from where you are to where you want to go.

"Where you want to go" is the statement of our Specific Objectives.

"Where your are" is the present status or situation. (It is typically found under Background in your Problem Statement ... Module 16).

A Change Objective can be illustrated thus:



The topic of Change Objective will not be discussed further in this module. A mathetics program on Formulating Change Objectives is available as an elective to this course. If you have the time and interest to pursue the topic, please request a copy of the elective from the training office.

MODULE 24

POST MODULE PRACTICUM

The objective of this module (and of this Practicum) is to write Specific (and Measurable) Objectives for (1) Your National Problem and (2) your On-The-Job Problem.

National Problem

Join with your country team to write specific objectives.

Consider your General Objective and determine what reasonably can be accomplished by the Alternative which you have selected and modified. Write Specific Objective(s) which state exactly What is to be accomplished, how much is to be accomplished and When it is to be accomplished.

If the "What" in your General Objective is fairly general, e.g., increase literacy, increase participation in Government, improve communications ... give sufficient examples of what is meant.

Follow up your Specific Objective with Measures of Achievement, stating exactly how you would be able to tell whether or not the objective is being achieved.

Use the form below:

Specific Objective (What, How Much, When) _____

Examples; if necessary _____

Measures of Achievement _____

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

On-The-Job Problem: Follow the same procedure as for the National Problem, consulting with fellow participants or training staff as necessary.

Specific Objective (What, How Much, When) _____

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Examples; if necessary _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Measures of Achievement _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

SERIES 5

MODULE 25

SEMINAR ON ALTERNATIVE SOLUTIONS

INNOTECH

MODULE 25

PREVIEW

In Module 23 you made an analysis of the the alternative solutions generated for your national and on-the-job problems, selected the best possible alternative or combination of alternatives and perhaps modified them on the basis of the resources and constraints obtaining in your country. Based upon your selected solution, you formulated the specific objective to solve your national and on-the-job problems in Module 24. In this seminar you will present the solution you have worked out for your national problem and discuss it with your colleagues from other SEAMEO countries for possible refinement.

OBJECTIVES

The participant shall:

a. Describe the alternative solution selected for his national problem, the process by which be arrived at the solution as well as the modifications made, and reasons for such modification.

CORE INSTRUCTIONAL ACTIVITIES

Before the Seminar: Meet with the other members of your country team and together, prepare your presentation. The following outline is suggested:

I. The problem (as reported in Module 17).

II. The General Objective (Formulated in Module 18).

III. The selected alternative or combination of alternatives as worked out in Module 23 -- include a brief description of the modifications made and the reasons for such modifications.

IV. The Specific Objective as formulated in Module 24. Include a brief explanation of your basis for the specific objective in relation to the selected solution.

<u>During the Seminar</u>

1. Each country group will be allotted 40 minutes -- 15 minutes for presentation and 25 minutes for comments and questions that may be raised

2. After the presentation by a country group the other participants may raise questions for clarification or make comments or suggestions that they believe would be of help to the country group concerned.

After the Seminar

The country groups may meet again for further refinement of their work and for making whatever revisions may they feel necessary based upon the comments and suggestions given during the seminar.

A copy of the country group work should be submitted to the Training Staff.

SERIES 5

MODULE 26

THE INDIVIDUAL AS AN EDUCATIONAL INNOVATOR AND CHANGE AGENT

INNOTECH

Developed from Original Material by
Jerry Short
University of Virginia

MODULE 26

PREVIEW

At this stage, you have now acquired the necessary skills in the application of the systems approach to educational problems. You have demonstrated these skills by developing potentially efficient solutions to your national and on-the-job problems through the application of the systems approach.

Unless you do make some attempt to get your proposed solutions accepted when you go back home all that you have worked out will be nothing but exercise.

But how can you get all the people concerned ------ the top officials in your Ministry, your immediate superiors, co-workers, teachers, and the general public ------- to accept your proposed innovations?

The modules in this block provide some pointees on what to do and how to go about the formidable task of effecting change. This module describes some general forms of behavior that will make it easier for you to become a successful innovator and change agent.

OBJECTIVES:

After completing this module, you should be able to:

(1) Describe three strategies which you, as a change agent can set for yourself to bring about educational innovation within your country.

(2) Describe at least two specific ways by which you might achieve each of the three objectives in your own job.

CORE INSTRUCTIONAL ACTIVITIES

(1) Study the module, and as you proceed, answer the Self-Evaluation questions at the end of each part in writing.

(2) Compare your written responses with our suggested answer.

(3) When you have finished the module, work on the Post-Module Practicum. When you are through, discuss your work with other members of your country team.

(4) If you need any assistance in the process, contact any member of the training staff.

MODULE 26

At this stage, you are wondering how you can make use of the training you received at Innotech when you return home. You probably do not expect to be suddenly promoted upon your return to a much higher position than you are holding now, where you might have the power and authority to initiate a major innovation. Instead, you will likely be back in your own job where you probably see very little chance to be able to try out anything new, or to apply the skills that you have learned.

One graduate of a training course like this expressed his feelings thus:

> "I've learned a lot of important things, but I am going back to my old job and my boss is a traditionalist. He is not going to let me try anything new. I am going to be unhappy doing things in the old way when I have learned some better ways of doing them. But I cannot do anything about it. I will not have the opportunity to innovate."

Even when graduates are more optimistic about their future their plans are likely to be vague. For example, another graduate, when asked what he would do after the training could only give this general answer:

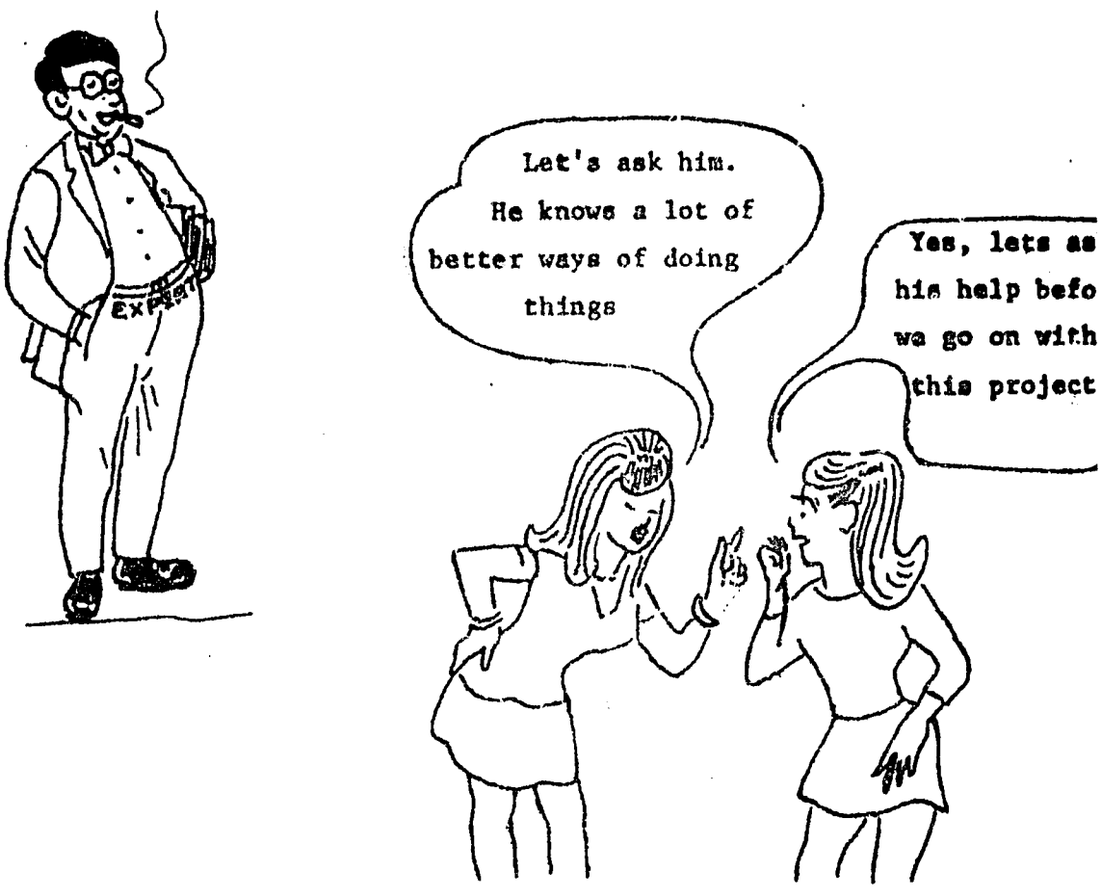
> "I'll try to do my best to help improve the standard of education in my country by using all the means in my power. It's very hard to say right now what I'll do later on."

What can one person do if, for example he is the only innovator in a whole school district? What specific actions can one person perform by himself to bring about educational change?

This module discusses some things that you might do. It describes three targets that you can set for yourself and which you can use to evaluate your own progress as an innovator.

THE INDIVIDUAL AS AN EDUCATIONAL INNOVATOR AND CHANGE AGENT

Target No. 1 - BECOME AN IMPORTANT, WELL-KNOWN, USEFUL EXPERT ON EDUCATIONAL INNOVATION AND TECHNOLOGY.



When people say things like this about you, then you have achieved your target. You have indeed become an expert; people know it and they want your help.

But how do you reach that stage? How does one become an important expert? The hardest thing about becoming an expert is getting started. YOU HAVE ALREADY ACCOMPLISHED THE HARDEST PART BECAUSE YOU HAVE ALREADY STARTED. You have started by participating in this specialized training program. And when you get back home, people are going to ask you what you learned and what you did.

When people ask you such questions, you are well on the way to becoming an important, well-known and useful expert in educational innovation and technology. Those are excellent opportunities for you to present your ideas, and you can present them in two ways. One way is the conversational answer to a question a friend or colleague might ask.

For example:

Colleague: What did you do while you were in training?

Innovator: (that's you) I got a lot of ideas about new approaches to education. I would like to use some of them. But first, I have to identify our most important problems and needs. What do you think are our most important needs in education?

The innovator's answer attempts to do two things. First, it shows that the innovator has learned new concepts that he feels are important. Second, it shows that he is eager to listen to his colleagues. By listening attentively, the innovator may learn a great deal, and he will convince his colleagues that he is important. Probably the best way to become an expert in someone else's eyes is to listen attentively to his ideas.

Another way by which you might present your ideas is the formal talk. A formal talk prepared for groups is one type of presentation that you can develop while you are in training. In such a talk, you can define educational innovation and technology and give examples of how it can be used. You can use as many technological devices as possible. For example, behavioral objectives, illustrations and tryouts. You can have such talks prepared in anticipation of opportunities for delivering them, and keep revising them until you can deliver them easily and naturally so that they would achieve the desired effect.

There are many other ways that an innovator can establish himself as an expert. Here are a few ideas:

-- Write (or translate) articles about innovations. Such articles can be published in journals, professional magazines, and other publications usually read by teachers and students of education.

-- Volunteer to give a formal talk to any group or class that would listen.

-- Search out people and listen to them as they talk about educational and national problems.

-- Loan books, programs and articles to interested people.

-- Write reports or working papers for committees and work groups.

SELF-EVALUATION - I

A. One way suggested in this module to get you started as a useful and important expert on educational innovation and technology is by expressing your ideas through informal conversations with your friends and colleagues. Now, think of the conditions in your own place back home and identify at least three (3) groups of people on whom you might apply this strategy with the greatest effect. Write down your answers below:

(1) _____

(2) _____

(3) _____

B. Another way suggested in this module is by delivering formal talks prepared for certain groups. Again thinking of the situation in your own place of work, write down below, a brief description of at least two such groups to whom you could possibly deliver talks, and after each, the topics that you think would most interest them.

(1) Group: _____

Subject of My Talk: _____

_____

(2) Group: _____

Subject of My Talk: _____

_____

(3) Group: _____

Subject of My Talk: _____

_____

FEEDBACK TO SELF-EVALUATION I

Your opinion was called for in Questions A and B, and you are the best judge of your answers. However, your answers might have included some of the following possibilities:

A. Types of people to whom you might express your ideas by informal conversation:

(1) Your co-workers, people holding positions similar or equal to yours. (For example, your fellow school inspectors if you are a school inspector.)

(2) People over whom you exercise direct supervision and/or administration.

(3) Your immediate superior and other higher officials. (You will most likely pay your respects to some of them upon your return and they will invariably ask questions about the training course you undertook. That's an excellent opportunity for you.)

(4) Professors, instructors and officials of teacher training colleges.

(5) Officials of teachers organizations.

B. Groups to whom you might deliver formal talks:

(1) Fellow workers especially during staff meetings, conferences, etc.

(2) Teachers and other school officials at in-service education activities such as seminars, workshops, etc.

(3) Classes in teacher training schools and colleges.

(4) Faculty members of teacher training schools and colleges.

(5) Convocations organized by teachers associations.

Note: The specific subject of such talks will of course depend on their particular interests. You would know best what to deliver to them.

There are many other ways by which an innovator can get established as an expert. Here are a few ideas:

1. Write and publish articles.

You could write articles about innovations, the application of the systems approach to educational problems, and other subjects in which you have acquired the expertise in this course. Or you can translate articles like those in the local languages. Such articles can be published in professional magazines for teachers, teachers' journals and other publications that are usually read by teachers and educators. Most editors of such publications find it difficult to get enough good articles with every issue. They will therefore welcome your contributions if they are worthwhile --- and invariably ask you to write more.

2. Participate in or extend help to committees or work groups.

Try to be "in" on committees and work groups. Most people avoid membership in such committees because it means extra work You should do the opposite, especially in the case of committees that involve educational planning or special work groups assigned to solve some educational problem. Such groups may have use of your skills. Even when you are not in such committees, you can still offer your help by writing reports or submitting papers that may help the committee in its work.

3. Loan books, programs and articles to interested people.

This can have two desirable outcomes: First, more and more people will be seeking you out whenever they need to know something about innovation and technology, and second, this will increase the number of people who would be willing and able to innovate.

SELF-EVALUATION II

Describe at least five other ways to increase your own importance as an educational expert in your own country.

(1) _____

_____

_____

(2) _____

_____

_____

(3) _____

_____

_____

(4) _____

_____

_____

(5) _____

_____

_____

FEEDBACK (II)

Your answer might include ideas such as:

-- Volunteer to participate in in-service training programs to learn new ideas and share your own ideas.

-- Meet periodically with other innovators, e.g., fellow graduates, board members, etc.

-- Help others with their problems.

-- Write papers on your own work and give them to others to read and make suggestions for improving them.

-- Write articles analysing existing problems from a total systems point of view.

-- Write a model lesson and publish it in an educational magazine.

-- Read as much as possible about innovation and write about those innovations that would be possible to implement in a particular country.

-- Keep in touch with innovative centers and keep up-to-date on innovation and technology in education.

-- Encourage others to attend courses on educational innovation and technology.

-- Learn how to use and operate sophisticated educational media and equipment.

-- Have the right questions to ask anyone who is advocating a particular reform or plan for education.

Let us now assume that you have achieved some importance and prestige as an expert. You must now begin to use this prestige to encourage innovation and change. This is not easy to do. Many people who have gained prestige and importance do not know how to use them to accomplish their goals. To do so, you should establish a second objective for yourself.

Target No. 2. ENCOURAGE THOSE WHO WANT TO INNOVATE.
IGNORE THOSE WHO DON'T.

The new innovator should use his growing importance to encourage and reward those people who want to innovate and change. He can do this by paying attention to them, spending time with them, giving them ideas and support. At the same time, he should ignore those people who do not want to innovate and change.

It is tempting to devote a lot of time to people who do not want to change by trying to convince them to change. But the innovator probably will not convince them by arguing with them and he will find that he has no time left to help those people who want to change.

The innovator should take a positive approach towards those who try to innovate, even when they do not succeed. The innovator cannot expect perfect projects and products; so he should encourage anyone who makes an attempt to change, even if the attempt is quite small and apparently insignificant. If the change is an improvement, no matter how small, the innovator should encourage it.

Target No. 2 summarizes a general strategy for spreading successful innovation. The strategy was used last year in Singapore when an innovative primary curriculum was developed. The curriculum was made available on an optional basis, and teachers who wanted to use it were encouraged to do so. They were given training, assistance and encouragement. The other teachers who did not want to try the innovation were left alone. It appears that a successful innovation will spread quickly with little opposition when it is introduced in this way.

An authoritarian country can perhaps spread innovation in other ways. For example, Jerold L. Schutter reported in an article about China in Time (April, 10, 1972, p. 36) that when asked what career aspirations they held for their sons, the Chinese invariably answered that the choice is up to the State. "Whatever will serve the state will be good for my child." This innovation in career planning can be spread by authoritarian decree in China, but in other countries career planning for national growth can probably be introduced with more success by the strategy specified in Objective 2.

SELF-EVALUATION III

A. In your opinion, which teacher should an innovator spend more time with?

( ) a. A poor teacher who resists his help.

( ) b. A good teacher who asks for help with a problem.

B. In your opinion, which subordinate should the innovator spend more time with?

( ) a. One who says,"The new way will never work. The old way is better because we are all familiar

( ) b. One who says, "I can see the advantage of the new way. Can you help me get started with it?"

FEEDBACK (A and B)

In both examples, the innovator would make best use of his time working with the second person (b) and ignoring the first (a).

C. The members of a project staff have prepared some educational objectives. The innovator feels the objectives are better than the old ones, but he knows they are not as good as they could be. In your opinion, what should he say?

( ) a. "Your objectives need much more work. They are not stated in clear, behavioral terms. They are too vague. You have to be specific when your write objectives."

( ) b. "These objectives are a great improvement over the old ones because they are clearer and more specific. What do you plan to do with them next? Can I help?"

D. The innovator has been called in to evaluate a school. He finds that the teachers are using a new approach, but that they have no way of evaluating its success or failure. In your opinion, what should he say?

( ) a. "Your innovation is useless because you have no way to measure its effect. Unless you have an evaluation plan, you cannot tell if you are succeeding or failing."

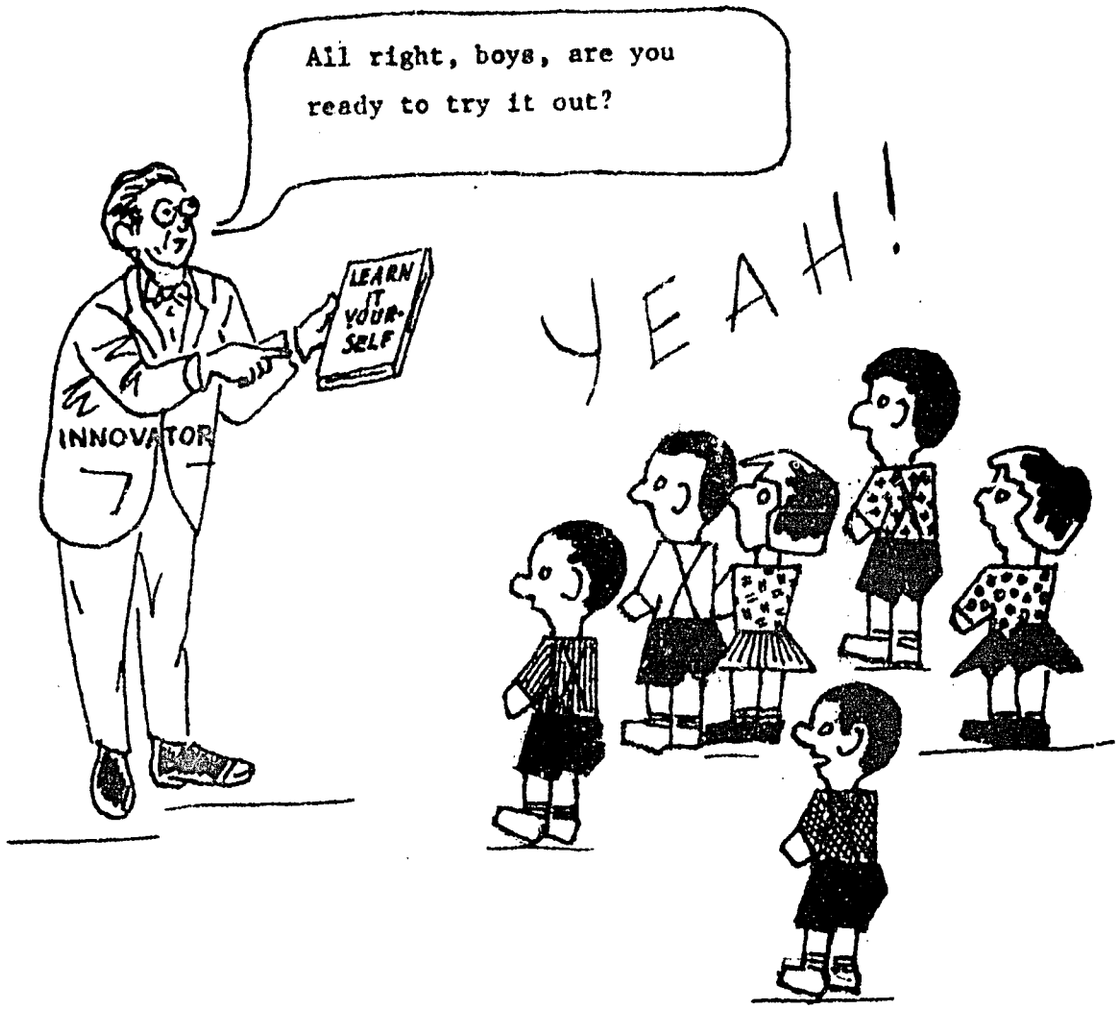
( ) b. "I am very pleased to see how well all the teachers are using the new approach. It is unusual to find everyone so enthusiastic about trying something new. Can I help you develop some ways of evaluating the effectiveness of these new approaches?"

FEEDBACK (C and D)

In the first answer (a), the innovator criticizes the obvious faults he has detected. In the second answer (b), he encourages those who have tried to change, and attempts to help them improve. It seems likely that the second approach will be more successful in maintaining interest in innovation by encouraging those who are trying to change, and by making ideas for improving the innovation process more acceptable.

Let's say that you have successfully accomplished Targets 1 and 2. You must still be aware of the danger of talking about innovation instead of doing it. If you are to remain important, you must produce something. Unfortunately, you will probably find it much easier to "talk" than to "do". You will meet many pessimists in education who will be anxious to discuss the impossibility of change. Avoid these people or you may start imitating them. Instead, you should choose action people as models and associates. Working with them will challenge you to take action too. Thus, the third objective:

Target No. 3: TAKE ACTION: DON'T JUST TALK!



One difficulty with the advice to "take action" is that the problems to act on are often overwhelming. How can an individual innovator take action to solve the large important problems that are critical in most educational systems? He cannot. But he can work with a part of a problem and design an individual action project of his own to solve part of the problem. Here are some possibilities.

Individual Action Projects.

New curriculum areas, such as population control, sex education, ecology, creative thinking, tutoring, career planning, moral development, managing money, etc., are good areas in which an innovator can create models to demonstrate applications of educational technology. For example, could an innovator sell a local newspaper on publishing a children's column with materials for readers to tutor non-readers? Or an educational comic strip? Or a column written by students? Could he sell a local radio or TV station on the idea of short messages for students, each teaching them some simple but important objective? Could he prepare a short model lesson and show people how it works? Could the innovator prepare a simulation game, a role playing case, unit of programmed instruction, a film, a tape? Could he do something like an engineer in the U.S. did in his spare time when he developed a set of environmental projects for primary students to teach them the importance and fun of conserving the environment? Could the innovator write a test and give it to some students to find out if they are learning to think scientifically and rationally about their world? Could he get one teacher to try an organizational innovation in her classroom such as having students tutor other students in each-one-teach-one style?

An example of an individual action project in Singapore follows: In a letter to the editor of the Singapore Straits Times, a student wrote: "I am a Secondary Four student and will be taking my Cambridge examination this year. Our foundation for mathematics is poor. Recently our mathematics teacher got into the habit of doing problems on the board without explanation and expected us to copy everything down into our exercise book. Although she gave us homework, she never checks our work. This means we will never know our mistakes. We have already used more than half our exercise books, but she hasn't even checked a page. Although we know that she has to go for her lectures at the teachers' training college, this doesn't mean that she can neglect her students." Probably several math teachers in Singapore revised their teaching methods after reading the letter.

SELF-EVALUATION (A and B)

A. In your opinion, which is the better person for an innovator to work with?

( ) a. One who says "We cannot begin until we analyze the problem for a year and consider the question of whether it is possible to write behavioral objectives for family planning."

( ) b. One who says "Let's visit the staff of the Family Planning Board today and see if we can draft behavioral objectives for family planning."

B. In your opinion, which person is the better innovator?

( ) a. One who argues with his colleagues about the best version of the systems approach to use in planning and implementing innovation.

( ) b. One who prepares a game called "Our Spaceship Earth" to teach ecological concepts and evaluates the game with a group of students.

FEEDBACK (A and B)

In both examples, Person b seems to be accomplishing the third objectives by taking action rather than just talking.

SELF-EVALUATION (C)

C. Describe at least five other individual action projects which you might undertake in your own country.

(1) _____

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(2) _____

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(3) _____

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FEEDBACK (C)

Your answers might include action projects such as the following:

-- Observe the behavior of children in different situations in the street to find out what they are learning and how we could take more advantage of natural learning situations.

-- Form an action group to revise our college syllabus, write objectives, and evaluate our work.

-- Try out programs with my own children during my spare time. The next step, if the programs succeed, is to go to some school under my supervision and get them to try them.

-- Apply a systems approach to planning my own work.

-- Work out the costs and benefits of a plan to solve the problem of crowded schools by using alternate days of schools, e.g., half the students might attend school on Monday-Wednesday-Friday and the other half on Tuesday-Thursday-Saturday.

-- Conduct workshops in programmed instruction, systems approach, and writing behavioral objectives.

-- Teach a demonstration lesson before my colleagues in which I apply the systems approach by using objectives, pretests, and posttests.

-- Design a small project to discover what secondary students find most difficult to accomplish: problem solving, studying, listening, personal adjustment, etc.

-- Conduct studies to find ways of improving my own lectures and teaching.

-- Construct quiz sessions about various subject matters for TV or radio for groups of school children.

-- Prepare a restatement of instructional objectives now in use so that they are presented in measurable, life-use terms.

-- Use critical incidents from teachers as a resource for preparing role playing case studies for teacher training.

-- Conduct a simulation game with associates to help them apply a systems approach to a particular problem they are trying to solve.

-- Develop tests to identify specific weaknesses students have in some of my country's schools.

-- Hold week-end discussions with teachers within my province to get new ideas about innovations which they have tried.

-- Create a set of psychological experiments to teach principles of behavior to grade school students.

SUMMARY

Three targets for individual innovators have been described. These are the objectives that an individual innovator could work toward regardless of his job assignment.

(1) Become a useful expert in educational innovation and technology.

(2) Encourage innovators; ignore others who do not want to change.

(3) Take action by starting your own individual action project.

There are many other objectives that an innovator could set as goals for himself. But these three alone should assure his success.

POST-MODULE PRACTICUM

Write a short composition describing how you can apply the three targets described in this module towards the solution of your on-the-job problem.

SERIES 5

MODULE 27

STRATEGIES FOR CHANGE

INNOTECH

MODULE 27

PREVIEW: Module 26 gave you some general pointers that would make it easier for you to become a useful educational innovator and change strategest. This Module provides a more specific course of action that will help you to gain acceptance not only of your proposed solutions to the national and on-the-job problems you have developed, but also of any innovation that you may initiate in the future. It describes the different stages that an individual goes through in the process of accepting or rejecting on innovation and the strategies that the innovator may apply in each of these stages. The concepts you have gained in Module 26 will have practical application in this Module.

OBJECTIVES: After completing this Module, the participant should be able to:

1. Identify the individuals and groups whose acceptance of the proposed solutions to the national and on-the-job problems will be necessary.

2. Describe the acceptance strategies that he would use on those individuals and groups at each stage of the change process.

CORE INSTRUCTIONAL ACTIVITIES:	Study the Module and work out the Self Evaluation Exercises and the Post Module Practicum for your on-the-job problem. When you have finished meet a member of the training staff and discuss your proposed strategy with him.

MODULE 27

Strategies For Change

I. How do Individuals Change?

How do people accept and adopt an innovation?

Instances when an individual fully accepts and adopts an innovation the first time he hears about it are very rare.

The adoption of a new idea or practice is not a single act. Rather, the individual goes through a series of mental activities and actions before he fully accepts or adopts a new idea. Researchers have studied this process and found that it usually follows a predictable pattern and involves six different stages or phases. These adoption phases can be used by the change agent as a guide in planning his strategies for acceptance and adoption of an innovation.

The six phases in the process of adoption of an innovation by an individual are as follows:

a. Awareness - At this stage, the individual first hears about the innovation or in other ways becomes aware of it. He does not have enough details about its nature and use and may have only a passive interest in it. He may not necessarily want to seek further information.

   Whether he will be motivated enough to learn more about the innovation and move on to the next stage may well depend on the manner by which he was first made aware of the innovation.

b. Interest. The individual now seeks to know more about the innovation. He wants to know how and why it works and how it compares with other ideas or practices that are supposed to perform similar functions. As he gathers more information about the innovation, the individuals' first attitudes (positive or negative) towards it begin to form. On the basis of these attitudes, he may either be motivated to move on to the next phase of the adoption process, or decide against it.

c. Evaluation. This is a period of "mental trial" of the innovation. In his mind, the individual applies the innovation to his own situation and decides whether or not it is worth-while to try it out. In the process he evaluates the idea and tries to figure out whether or not it will help him achieve his goals and objectives better. If he thinks it will, he decides to give the innovation a physical trial.

d. Trial. At this stage, the individual tries out the innovation on a small scale to find out how it will actually work in his own situation. In some cases this stage may consist of observation of the innovation as it works under conditions that are similar to his own. A primary concern of the individual at this stage is the specifics of the application and use of the innovation and other details pertaining to its operation.

e. Adoption. The individual now weighs and considers the results of the trial. On the basis of this, a decision is made to adopt (or reject) the innovation.

f. Integration. It is not enough that the individual adopts the innovation. True adoption can be considered to have taken place only when the innovation becomes routine and has been integrated into the regular work of the individual.

The exact lines of demarcation between some stages are not so clearly drawn. Of course in the first stage, awareness is clearly a point in time. Once an individual has been made aware of the existence of an innovation, he cannot have this particular experience again. We may say that the interest stage begins when the individual assumes any initiative to gather further information about the innovation.

An individual is in the evaluation stage when he attempts to relate the information he has gathered to his own situation. Most people begin evaluating as soon as they possess any facts and if they feel that they need more information, may revert to the interest stage. An individual may therefore go back and forth from the interest stage to the information stage until he comes to a decision i.e. to accept or reject the innovation.

Implications for the Change Agent

You, as the change agent can facilitate each of these processes. When dealing with the individuals whom you want to change, your activities will of course be geared to the particular stage the individual is in.

The following guidelines will help.

a. Awareness - Your primary aim here is exposure. Make sure that the individual hears, sees and develops some conception of what the innovation is about. He must form a clear and positive image. You must arouse curiousity. Motivate, at this stage rather than inform. Your message should be brief, interesting, easy to understand.

b. Interest - Encourage the individual to comes to you for more details. He will actively search for more information, including information from other sources. Promote group discussions. They will provide more information, ventilate doubts and above all provide you with opportunities for molding positive attitudes.

c. Evaluation - Provide the individual with the kind of information that will help him to envision the innovation in his own situation. In appropriate cases, a demonstration of the innovation under conditions that are similar to the individuals' home environment will greatly help. If the individual is shown how the innovation will benefit him, he will be more inclined to make a favorable evaluation.

d. **Trial** - The possibility of the individual's experiencing failure at this stage is very real. He needs maximum support and encouragement from the change agent. He will need training to carry out the new activities. Further demonstrations will also be needed. Above all, the change agent must be able to help the individual evaluate his own experience and point out the advantages gained from the innovation.

e. Adoption - Even at this stage the process of change is far from completed. The individual may still encounter difficulties in implementing the innovation. The change agent must therefore be ready to provide more training and encouragement. He must help the individual to adjust to the new situation and be ready to give help when unexpected difficulties are encountered.

f. **Integration** - After adoption the main task of the change agent is to nurture integration of the new skills and materials into the day-to-day behavior of the individual. Activities like follow-up questionnaires on the usefulness of the innovation, reminders in newsletters and practice sessions will all help to achieve the purpose.

We must remember that rejection can take place at any stage. Of course, when the innovation may not be appropriate for an individual a decision to reject would be a good decision. But when an innovation is indeed suitable then the change agent can do something to reduce the chances of rejection.

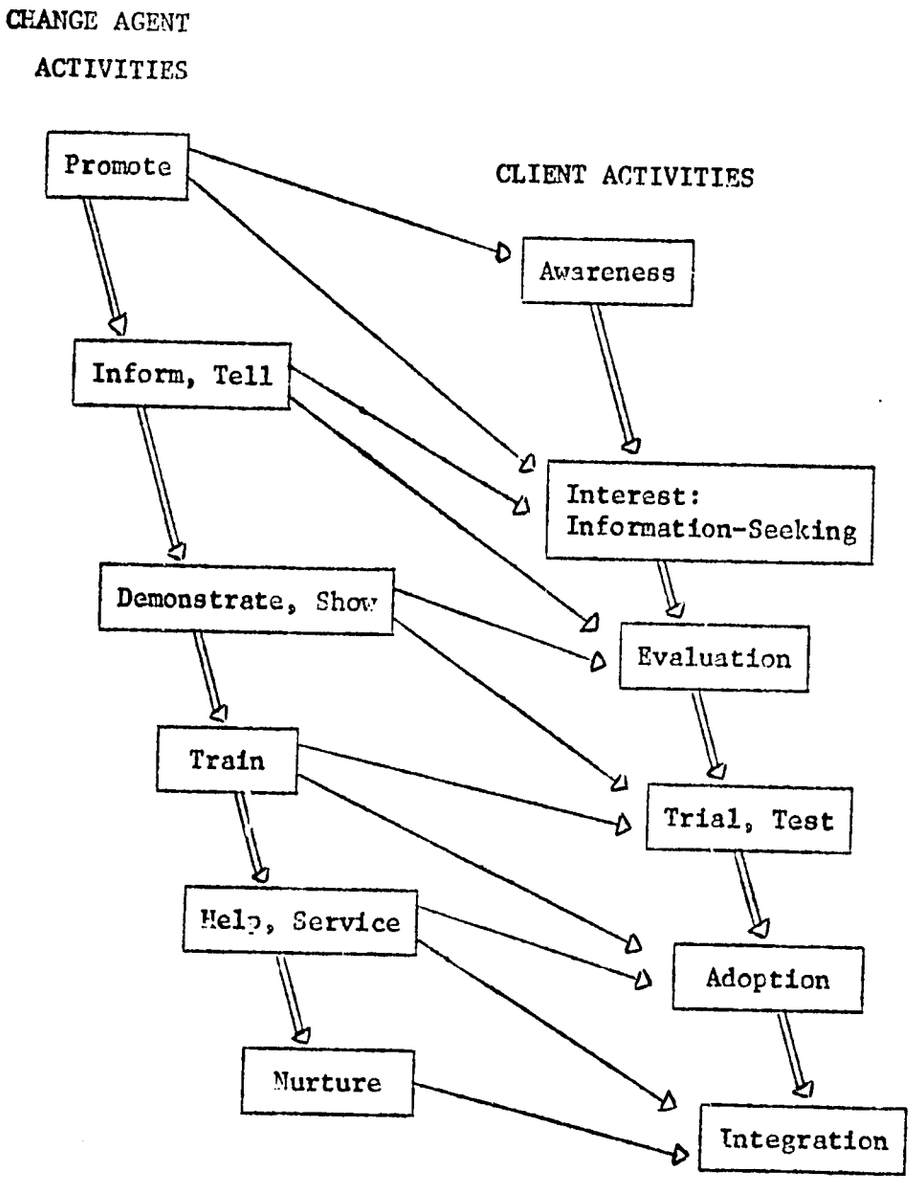
Here are some hazards that the change agent should avoid.

a. Hurrying the individuals through the stages - Must people need time to think things over before they make a decision.

b. Changing the order of steps - e.g. Adopting the innovation first & trying it out later physical trial before the mental evaluation, etc.

c. Skipping steps -- e.g. evaluating & rejecting without gathering sufficient information, or adoption without any physical tryout, etc.

The following diagram shows how the Change Agent can coordinate his activities with the individuals' adoption activities to facilitate the adoption process.



A Short Innotech Summary

1. The acceptance and adoption of an innovation by an individual follows a predictable pattern roughly consisting of six phases:

   a. Awareness - He first hears about the innovation.

   b. Interest - He becomes interested in the innovation and seeks more information.

   c. Evaluation - He makes a "mental tryout" to see if the innovation would be of any good to him.

   d. Trial - He actually tries it out on a small scale.

   e. Adoption - He decides to adopt the innovation.

   f. Integration - He becomes so adjusted to the innovation that it becomes routinary.

2. At any of these phases, rejection can occur.

3. The change agent can facilitate adoption and minimize the chances of rejection by gearing his activities to the particular phase of the adoption process that the individual is in.

Self-Evaluation and Feedback

Situation: You want the teachers in your country/province/district to formulate their instructional objectives in measurable or behavioral terms. Check the activity that you, as change agent, think is the most appropriate for each stage of the adoption process. After you are through compare your responses with our Feedback.

1. Awareness
   - a. Explain the three components of a good objective and why they are essential.
   - b. Explain that instructional objectives can be formulated in measurable terms so that the teacher can tell exactly when it has been achieved.
   - c. Cite the opinions of Mager, Popham, and other authorities on formulating instructional objectives.

2. Interest
   - a. Give an example of an incorrectly stated objective and ask the teacher/s to restate it in measurable terms.
   - b. Explain that a good objective describes what the learner should be able to do, how well he must do it, and when. Cite the advantages of this to the teacher & the learners.
   - c. Distribute handouts on how to formulate instructional objectives.

3. Evaluation - a. Cite experiments undertaken abroad to prove the effectiveness of objectives stated in behavioral/measurable terms.

- b. Formulate some objectives first in the traditional manner; restate them in measurable terms, ask the teachers to do the same and show how the latter will make the learning process easier for both teacher and student.

- c. Go over the teachers' lesson plans and point out the improperly stated objectives.

4. Trial - a. Give a list of instructional objectives and ask the teacher to identify those that are correctly stated.

- b. Explain the three components of an instructional objective, cite examples and give further exercises to the teachers an formulating instructional objectives for their daily lessons.

- c. Gather the teachers to a meeting and give them a test on formulating instructional objectives.

5. **Adoption** - a. Inspect the teachers lesson plans to see if they are formulating objectives properly.

- b. Make the teachers feel and understand that you and others like you will be ready to help any time they encounter some difficulty and be sure to help when they ask for it.

- c. Ask them to read books on formulating instructional objectives.

6. **Integration** - a. Explain how formulating objectives in measurable terms has helped the teachers in their work.

- b. Talk with the teachers once in a while, make them share their experiences and extend any help that may still be needed.

- c. Make it plain that your job is done and they are now on their own.

Feedback

We believe that all items lettered "b" are the best in each group. You may have better ideas and we would appreciate your sharing them with any member of the Training staff.

II. How Groups Accept Innovations

To complete our understanding of how an individual adopts an innovation, we must also consider the structure of the group he is in and the social relationships that bind those individuals together. A person's position in this network of social relationships is the best indicator of when he is likely to adopt an innovation. A group may be defined as a number of people who have something in common which binds them together if only to preserve the common interest. This arrangement is usually very beneficial to all members of the group but sometimes it gets in the way when new things and new ideas are introduced from outside. When the group, whether individually or collectively decide that an innovation threatens the common good, then their common beliefs, values and interests become potential barriers. Some members of the group therefore serve (consciously or unconsciously) as some kind of filtering mechanism to sniff out new ideas and reject the ones that are undesirable to the group.

The first step for the change agent who wants to gain acceptance of the group is to identify those filters and the barriers that stand in the way of acceptance.

Acceptance of an innovation by a group begins with the acceptance by a few key members. From then on it begins to spread more rapidly usually by person-to-person contacts within the group. This chain reaction gathers momention and there is a rapid increase in acceptance until a large majority has been won over.

Three types of people play significant parts in generating group acceptance. They are the innovators, the resisters, and the leaders. Social scientists have extensively studied the characteristics of these three types, their places in the social structure, and how they work, regardless of the innovation involved.

a. The Innovators - Innovators tend to be intelligent, widely informed and risk-taking. They are usually very receptive to influence by outside change agents. But if they have been committed before to too many new ideas that have not turned out well, they may not have much influence on the group. In fact they may not even be taken seriously, hence, in such cases, they may not be effective allies.

b. The Resistors - The resisters are the self-appointed guardians of the "status quo". Resisters of various orders have been successful in preventing or slowing certain innovations. Yet they play a useful part in resisting intrusions from alien influences and serving as antibodies in the social blood stream.

c. The Leaders - Opinion leaders are found in any social group and are the key to the growth of any movement. They wield a high degree of influence and are held in esteem by a great majority of their fellowmen. They usually are not the first people to accept new ideas because they would want to maintain their standing. If they promote something which later turns out to be very undesirable their prestige will suffer. For the same reason they want to be champions of innovations that are timely, popular & feasible. So that they can better

size up a developing situation, they watch both the innovators to see how well the idea works and the resisters to test the social risks involved. It should be noted that leadership here refers to leadership of any kind - formal, informal, administrative or elective.

Implications for the Change Strategist

Social scientists describe the process of diffusing innovations as involving two steps: First: outside information about the innovation reaches the opinion leaders, and second: the opinion leaders pass this on either by word or by example to the members of the group. This, however, works only if the opinion leaders are innovators, or innovation - minded, and if they have very good follower connections in the group.

You, as the change-agent cannot assume that those conditions are present. So it may not be wise to depend entirely on this simple two step process. However you can use the basic concept of these two steps to develop a strategy in which the key people we have identified will serve as "stepping stones" to gain acceptance. One such strategy suggested is as follows:

1. Introduce the innovation to a core group of "innovators". Get them to try out the innovation and to demonstrate it to others.

2. Work on the potential "resisters". Make them realize that the innovation does not violate their values nor run counter to the established system if possible, before they have started voicing opposition. Even if they are already vocal

and mobilized against the innovation, you can at least protect the innovators and make the innovation less vulnerable. You must have sound answers to their questions and be realistic in your approach. You might not be able to silence their opposition but in many cases you will be able to disarm them and prevent them from their gaining more supporters.

3. Bring the innovation to the attention of the leaders. Allow them to observe live demonstrations by the innovators and to sound out the reactions of the resisters.

4. Allow the leaders to lead the way to acceptance by the rest of the system. If possible get them to publicly commit themselves to the support of the innovation.

But in following any group acceptance strategy, we must not forget that groups are made up of individuals and that each individual has his own step-by-step process of acceptance. Thus while working on 'evaluation' or "trial" with innovators, you may be working on "awareness" or "interest" with leaders. You must be ready to provide each set of individuals with the kind of information that they are ready for at any particular time,

Post-Module Practicum I

In this practicum, you will analyze how the process of adoption described in this Module, and the strategy for group acceptance applies to a particular innovation that occured in your country.

Step I. Think of an innovation that was effected in your country. Briefly describe it here (The problem and the background, the innovation launched to solve it and what successes it achieved, if any. Identify the change agent/s in its acceptance strategy (As much as possible, no two participants should report on the same innovation. Get together with other members of your country group to avoid duplication).

Step 2. Describe the activities undertaken by the change agent at each stage of the adoption process.

A. Awareness - _____

B. Interest - _____

C. Evaluation - _____

D. Trial -

E. Adoption -

F. Integration -

<u>Step III</u>. Now think of a specific group that adopted the innovation. (Ex: School teachers, students, etc.) Briefly describe how the group accepted the change, (e.g. the types of people who first tried it out, the types who opposed, how leaders played a part, if any, and the outcome.) Include the role of the change agent in the various aspects, and, finally, compare the process with the four-step strategy for group acceptance described in Part I of this Module.

Post-Module Practicum - II

It is now time for you to plan your own strategy for acceptance of your on-the-job problem. The following may help you to plan your strategy.

Step I. Identify the persons, officials, or groups who need to support, accept, or tolerate your proposed solution. Write them down in the first column of the forms included in this practicum. The following list may serve as a guideline. You will of course delete, add or replace persons or groups as needed.

Top National Level

Top executive
Legislative body
Advisory group

Ministry of Education

Minister and Deputy Minister
General Committees
Director of Primary Education
Director of Secondary Education
Director of Higher Educations

Other Ministries/Departments/Etc.

Ministry of Finance
Ministry of the Interior
Ministry Public Works
Budget Commission
Military

Other Groups

Religious groups
Professional Organizations
Students' Federation

Local Level

Administrative Officers

Head of Local Government
Provincial Treasurer
Provincial Commander (Military)

Educators

Provincial Education Chief
Provincial Supervisors/Inspectors
District Supervisors/Inspectors
Principals
Teachers
Provincial and Municipal school Boards

Local Leaders

Religions leaders
Economic - Business - Agriculture
Political leaders

Parents

Parent - Teacher Associations

Students

Primary
Secondary
College Students

Step 2 In the small box (second column) put an (X) after each individual or group whose acceptance of your proposed solution is critical i.e. the innovation cannot be effected without their support and/or approval.

Step 3 After each person or group, write down in the third column the "selling points" of your proposed solution that you think will appeal positively to that person or group.

Step 4 Under the fourth column, write down the possible negative perceptions of each person or group i.e. What they would consider unfavorable implications
(Note the examples below.)

PERSONS/OFFICES GROUPS	CRITICAL	POSSIBLE POSITIVE PERCEPTIONS	POSSIBLE NEGATIVE PERCEPTIONS
Director of Primary Education	X	1. The solution will improve quality of learning and 2. Provide easier management of educational system.	1. It will be necessary to retrain some teachers. 2. Additional funds have to be secured.
Primary School teachers		This plan will minimize teacher's paper-work and reduce the problem of dropouts.	1. Will have to undergo training for their new roles. 2. Some teachers may be laid off.

TARGET GROUPS AND THEIR POSSIBLE PERCEPTIONS

PERSONS/OFFICES GROUPS	CRITICAL	POSSIBLE POSITIVE PERCEPTIONS	POSSIBLE NEGATIVE PERCEPTIONS

At this stage, you now have an overall picture of the targets of your acceptance strategy, persons or groups whose acceptance is indespensable as well as possible reasons for acceptance or rejection.

In this module, you also have gained some idea of the process of change among individuals and groups. We are also confident that your Post Module Practicum I gave you some ideas on how change can be effected in your country. All these, plus the pointers given in Module 26 should now enable you to plan a strategy of acceptance of your proposed solution to your on-the-job problem. You will now proceed to Step 5.

Step 5. Attached are blank forms for your proposed activities at each stage of the adoption process. Taking into consideration, the negative and positive perceptions, describe your proposed activities as change agent for each stage.

The following outline is suggested for each stage.

A. Specific activities for "critical" individuals or groups.

B. Specific activities for non-critical individuals or groups, but who require a different approach.

C. Activities for individuals or groups for whom a uniform or general approach would be adequate.

Please do this in duplicate, the carbon copy to be given to a member of the Training Staff.

If you need additional forms, please secure them at the Training Office.

When you are through, discuss your acceptance strategy with a member of the Training Staff.

Good Luck to you!

On-The-Job Problem Application

Change-Agent's Activities in the Adoption Process

Stage _____

Target Individuals/ Groups	Change Agent's Activities

SERIES 5

MODULE 28

Seminar on Strategies for Change

INNOTECH

MODULE 28

PREVIEW

Module 26 gave you some pointers to help you in your task as an agent of change. Module 27 described the adaption process and its implications to you as change agent. In the same Module, you analyzed how acceptance to an innovation was brought about in your own country and made use of this analysis in drawing up acceptance strategies for your on-the-job problems.

In this Module, which features small-group workshops and oral presentations you will use the skills and concepts gained in the last two Modules to prepare acceptance strategies for your national problem and explain the rationale of those strategies in the light of the cultural, social and other aspects of your countrymen.

OBJECTIVES

After completion of this Module, each participant should be able to:

(1) Describe the strategies at each stage of the adaption process that have been successful in effecting change in his own country,

(2) Prepare an over all strategy for acceptance of the proposed solutions to his national problem applying, pertinent strategies identified in Objective (1), and

(3) Explain the basis for those strategies in the light of social, cultural and other conditions in his own country.

CORE INSTRUCTIONAL ACTIVITIES

1. Before the Seminar: Read through the procedures for developing a change strategy contained in the attached pages. After you are through, meet with the other members of your country group and cooperatively work out the activities prescribed therein. When you have finished, you will have evolved the following:

   a. A description of the strategies at various stages of the adaption process that have successfully brought about changes in your country.

   b. An acceptance strategy for the proposed solution to your national problem specifying the target individuals and groups and special strategies for individuals and groups whose acceptance is either critical or requires a special approach.

   This is what will be presented at the seminar.

2. During the Seminar. Each country group will deliver their report on strategies for change which will be in two parts as previously mentioned. After each presentation participants are encouraged to questions for clarification as well as suggestions for possible strategies.

3. <u>After the Seminar</u>. Meet with your country group again. Discuss any suggestions that may have been given pertaining to your strategies, modify and finalize your acceptance strategy for your national problem. As soon as you are through, deliver your work to the training staff for reproduction.

Examine and compare the strategies reported on each stage of the adoption process of the innovations each of you worked on during the Post-Module Practicum I of Module 27. In the spaces below, list down the strategies that were employed in most, of the innovations at each stage. You may add other strategies that have been successfully employed by change-agents in your country.

A. AWARENESS. _____

_____

_____

_____

_____

_____

_____

_____

B. INTEREST. _____

_____

_____

_____

_____

_____

_____

_____

c. Evaluation.

d. Trial.

e. Adoption.

f. Integration.

Now examine the common features of the second part of Post-Module Practicum I, paying particular attention to individuals or offices whose acceptance accelerated the adoption process by individuals/groups. Using this as a basis, write a brief description on how change occurs within groups in your country.

You will now prepare your acceptance strategy for the proposed solution to your National problem. The procedure is essentially the same as that you employed for your On-the-job problem (Post-Module Practicum II of Module 27) except that in this case you will work as a country team. Use the forms in the following pages. You may refer to the directions in Post-Module Practicum II of Module 27 if necessary.

TARGET GROUPS AND THEIR POSSIBLE PERCEPTIONS

PERSONS/OFFICES/ GROUPS	CRITICAL	POSSIBLE POSITIVE PERCEPTIONS	POSSIBLE NEGATIVE PERCEPTIONS

The next few pages are blank forms which you may use for your proposed change - Agents' activities at each stage of the adoption process. In planning these activities, take into consideration the following:

a. Strategies that have been successfully employed in effecting changes in your country.

b. The possible "positive" and "negative" perceptions of various individuals or groups.

Your proposed change - agent activities for each stage of the adoption process may be presented in the following order:

a. Specific activities for "critical" individuals or groups.

b. Specific activities for non-critical individuals or groups but who will require a different approach.

c. Activities for individuals or groups for whom a uniform or general approach would be sufficient.

National Problem Application

Change Agents' Activities In the Adaption Process

Stage _____

Target Individuals/ Groups	Change-Agent Activities

Stage _____

Target Individuals/ Groups	Change-Agent Activities

SERIES 5

MODULE 29

THE PROCESSES OF TRYOUT, EVALUATION AND REVISION

(PLANNING AND SCHEDULING)

INNOTECH

MODULE 29

PREVIEW

With the completion of change strategies, the basic steps in educational planning, decision-making and strategies for change are concluded.

No matter what systems approach model you have developed during this course, we are sure that your model includes further steps having to do with the tryout and implementation of your selected alternative, its evaluation and the provision of feedback for the improvement and revision of your objectives and alternatives.

The complete processes of tryout, implementation, evaluation, feedback and revision cannot possibly be learned in the short time available in this course. The time required to master the necessary skills in research design and project management usually take a number of years at the University level plus a number of years of practical experience.

This module, therefore, can only give you a bare outline of some of the important considerations in the planning of tryout studies (Part I). However, Part II of the module will concentrate on one of the most significant aspects of project implementation: scheduling. You will have an opportunity in Part II to learn the Critical Path Method for the development of project schedules.

OBJECTIVES

1) Be sufficiently aware of the important design considerations so that one can use professional literature and expertise in the design of tryout studies.

2) Be able to optimize scheduling of both tryouts and implementation through the use of the Critical Path Method.

MODULE 29 (PART I)

DESIGNING TRYOUTS

In this course you have given much time to finding a workable alternative approach for achieving a specific and measurable objective. So far, however, what you have developed is only an idea ... a new (and possibly better) way to achieve your objective. But you don't know if it really will work or not. You also don't know what changes you may have to make to your idea so that it will work. It is important that you try out your idea in a real situation and to revise it on the basis of what you find out. (Remember the feedback loop in the systems approach diagram?)

> Important note: Nothing that you will learn in this module will prepare you to design an experimental tryout. Unless you already possess the necessary skills in research design, your best approach is to ask for help ... consult with an expert in research design, making sure that you ask enough questions so that you will understand. Your understanding is critical, otherwise it will be too easy to fall into error as you conduct your tryout.

> An expert in research design and statistics usually can provide the answers you seek provided that he is asked about the problem before the experimental tryout is begun. It is not reasonable to expect any statistician to reach in his hat and find an appropriate technique to analyze the

results of a poorly designed or executed tryout. Design your experimental tryout in consultation with an expert in research design and statistics.

Why try out? There are two reasons: (1) simply to see if your alternative will work and (2) to determine what changes should be made to make it work better ... so it can be implemented later.

What is a tryout? It represents, on a smaller scale, the operation of your alternative if it were to be fully implemented. It is because it is on a smaller scale that its design is extremely important. You want to make inferences from a sample (your tryout) to the total population that would be included in a full-scale implementation. Therefore the way that you sample is of utmost importance.

If you are to make valid inferences your sample should be (1) representative of the total population for which your alternative is designed and (2) be of sufficient size to give you confidence in your results.

For example, if your alternative concerns a way to learn more effectively, and you would hope to apply it to all 4th graders in your country (your population); you will have to include all types of 4th graders (urban/rural, boys/girls, language backgrounds, etc.) in order that it be representative ... and you will have to include enough children in each category (sample size) so that you can make statistical inference to your total population.

Again, consult with an expert in research design!

Even before beginning a full-fledged tryout, it is always a good idea to do informal pre-tryouts with only a small number. The purpose of pre-tryouts is to improve your procedures. (Do children understand my instructions? Can people answer a question like this? Are the mails too slow for me to get the information in time? etc. etc.) In pre-tryouts, you are not trying to make inferences, you simply are trying to find out if your procedures are OK.

Inferences from a sample to a population depend on data ... the measures that you are going to take. No expert in statistics can give you much help after you have collected "bad" data, but such an expert can help you design your experiment to collect "good" data.

The measures that you take are typically of two kinds: (1) summative and (2) formative.

Summative measures answer the question of whether or not your alternative works. Formative measures answer the question of what changes are needed to improve your alternative.

Summative measures come directly from the specific objective which you developed in an earlier module. In that module we stressed that the objective must not only be specific, but it also must be measurable. (Look back at your specific objective now. Did you make sure it was measurable?)

> For example, we did not simply give as an objective: "read a newspaper". We gave examples (measurable) about what "read a newspaper" meant ... temperature, results of football matches, etc. These examples made the objective measurable.

How to measure, however, is a topic that we did not emphasize. Nor can we emphasize it here because the field of measurement and evaluation is as difficult as the field of research design itself. Again consult with an expert, but be sure that you can honestly say when you are done: "If the measures which I have included are satisfied, I will be able to say that my objective is achieved".

> We on the INNOTECH staff typically use the Post-Module Practicum as our summative measure. We say that "if the practicum is completed satisfactorily, our objective is achieved".

Formative measures help us to improve our alternative. Ask yourself what aspects of your alternative need to be checked out. Just as in your informal pre-tryouts you tried to improve your procedures, you also will want to continue this kind of measure in the tryouts themselves. If, for example, your alternative did not work as well as you hoped ... will you be able to say why it didn't work? (Look now at your alternative and ask yourself what parts of it may be critical to its success ... and what information you will need to improve them in case they are not working properly).

> We on the INNOTECH staff use our discussions with you and the module feedback sheets as a basis for improving the course. These procedures provide us with formative measures ... the <u>feedback</u> loop in the systems approach model.

Tryout procedures attempt to represent your full alternative in as far as is practical and reasonable. The description of your alternative solution which you wrote in an earlier module depicts how the alternative would operate when implemented. In specifying how you would try out the alternative, however, you may find (1) that only certain aspects need to be tried out and (2) that it may have to be phased in stages, allowing the full-blown alternative to grow as you gain more experience with it. You will have to ask yourself, therefore: what portions of your solution must be tried out? and what incremental phasing, if any, may be necessary? Once you are able to answer these questions you should be able to outline exactly what you intend to do. (Look at the description of your alternative and decide what is to be tried out ... and of it? ... or what critical portions?)

Many tryouts fail, not because the alternative or the technical design was bad, but because project management was inadequate. In laying out the steps to be taken in a tryout, it is important to consider the following ...

... What is to be done?

... What must precede it?

... What information is needed to do it?

... Who is to do it?

... What problems can be foreseen?

... What materials/equipment/facilities is needed to do it?

... What administrative support is needed to do it?

... How long will it take?

A systematic consideration of the above points should enable you to develop a plan which will provide for all management needs. One of the most critical aspects of management is scheduling ... a topic that will be covered in Part II of this module.

Review (Part I)

... Unless you already possess the necessary skills in research design, consult with an expert. This suggestion also applies to the development of both summative and formative measures: Consult an expert in measurement and evaluation. Experts should be consulted before rather than after you conduct tryouts.

... There are two main reasons for conducting tryouts: (1) to see if your alternative will work ... will it achieve your objectives? and (2) to find out what changes are necessary to improve it. The first purpose assessed by summative measures which are directly tied to your objective. The second purpose is assessed by formative measures which suggest improvements of critical aspects of your alternative.

... Since a tryout is only a sample of the total population that your alternative is intended for it is important that your sample be (1) representative of the total population and (2) of sufficient size so that you can make statistical inferences from the sample to the population.

... Pre-tryouts are conducted informally in an effort to improve your procedures before beginning a more-extensive experimental tryout.

... Depending upon your alternative, you may not have to try it out completely. Perhaps trying out certain portions will be adequate to answer both your summative and formative questions.

... Tryout procedures and management can be systematized by describing each step and answering the following questions:

... What is to be done?

... What must precede it?

... What information is needed to do it?

... Who is to do it?

... What problems can be forseen?

... What materials/equipment/facilities is needed to do it?

... What administrative support is needed to do it?

... How long will it take?

MINI PRACTICUM

Meet with your country group and training staff. Consider your national problem.

A. Name 5 characteristics of a tryout sample to insure that it is representative of the population your alternative is designed for. (Do not consider sample size since that is a statistical consideration).

Sample characteristic 1. _____

_____

_____

_____

Sample characteristic 2. _____

_____

_____

_____

Sample characteristic 3. _____

_____

_____

_____

Sample characteristic 4. _____

_____

_____

_____

Sample characteristic 5. _____

_____

_____

_____

B. Review your specific objective and suggest three types of summative measures which would measure the achievement of your objective.

Summative measure 1. _____

_____

_____

_____

Summative measure 2. _____

_____

_____

_____

Summative measure 3. _____

_____

_____

_____

C. Now review the description of your alternative and decide what aspects of it may need to be improved based upon tryout results. What formative measures are most critical to be used as a basis for improving the alternative?

Formative measure 1. _____

_____

_____

_____

Formative measure 2. _____

_____

_____

_____

Formative measure 3. _____

_____

_____

_____

D. Is there any need to modify or simplify your alternative for tryouts? Or, can it be reasonably tried out in its full form?

If you feel that it could be simplified for tryouts, give a short explanation below of how it could be modified so that you could still get all the information you will need.

No modification needed ☐ (If you check this box, do not continue)

The following modifications are needed _____

PART II

Critical Path Method

We closed Part I by saying that tryouts often fail not because of a fault in the alternative itself, but rather because the tryout was badly managed. There is a need to plan ahead for management to insure that the proper persons, materials and procedures are brought together on schedule. This need is not limited solely to tryouts; it is even more important when we attempt to implement a totally new program.

Simple program are relatively easy to schedule, but as we progress to complex programs, the interactions among the various steps and procedures require more systematic and sophisticated means for insuring optimum schedules. The Critical Path Method (CPM) will allow you to schedule complex programs to achieve the earliest completion time.

Projects and plans often suffer from unnecessary delays in their implementation. These delays are due to several factors which have not been considered ahead of time. An integral part of a project is its schedule. The schedule presents the the time flow of resources that are necessary for the completion of each activity or the project. The schedule serves as one check on the feasibility of the project. More importantly, the schedule can serve a control function during the implementation of the project. By looking at the schedule, a project manager can readily see if the project is ahead or behind schedule. From this reading, the manager is then in a position to take corrective action.

Until just a few years ago, there was no generally accepted procedure to aid in the management of projects. Each manager had his own scheme, which often involved limited use of bar charts -- a useful tool in production management but inadequate for the complex interrelationship associated with contemporary project management.

The Critical Path Method (CPM) is one of the techniques used in the systems approach concerned primarily with the conduct of a program so that cost and time required to complete the project are properly balanced, and excessive demands on key resources are avoided. This module limits the use of the CPM to the parameter of time only. The CPM utilizes the basic managerial functions of (1) planning, (2) scheduling, and (3) control.

The planning phase of any venture involves: (1) a listing of tasks or jobs that must be performed to bring about the ventures completion; (2) the determination of gross requirements for materials, equipment, and manpower; and (3) an estimate of costs and durations of the various jobs are made.

Scheduling is (1) the laying out of the actual jobs of the project in the time order in which they have to be performed; (2) calculation of manpower and material requirements needed at each stage of production along with the expected completion of each job.

Control, begins with reviewing the difference between the schedule and actual performance once the project has begun. The analysis and correction of this difference forms the basic aspect of control.

Falling under these three basic components of CPM are a sequence of activities or steps in drawing the network of activities leading to the completion of a project. These include:

Step 1 - A listing of the necessary activities that can lead to the completion of a project.

Step 2 - The listing of the preceding necessary activities (PNA) corresponding to each activity listed in Step 1 and assigning of activity numbers to the PNAs to provide an appropriate sequence.

Step 3 - The determining of the length of time needed to complete each activity and drawing of the network diagram indicating each activity and time.

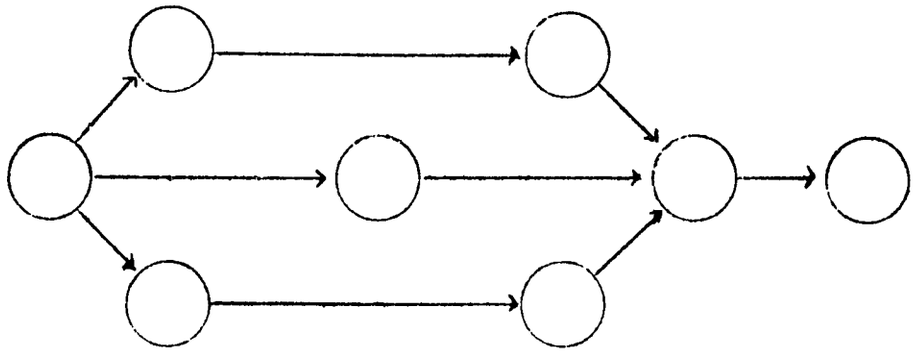
Step 4 - The identifying of the Critical Path(s) and making necessary adjustments in time based on expectations, resources and constraints.

NETWORKS

Development of Networks

The heart of network-based planning methods is a graphic portrayal of the plan for carrying out the program; such a graph shows the precedence relationships, i.e., the dependencies of the program's activities leading to the end objective. We call this graph a network.

A simple network is shown below.

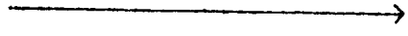


Simple Network

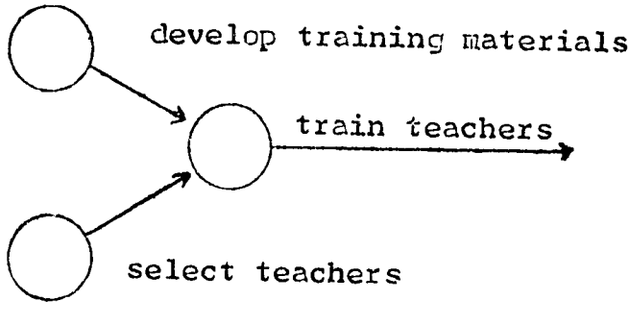
A network is based on the following principles:

1. An activity is depicted by an arrow

Train Teachers



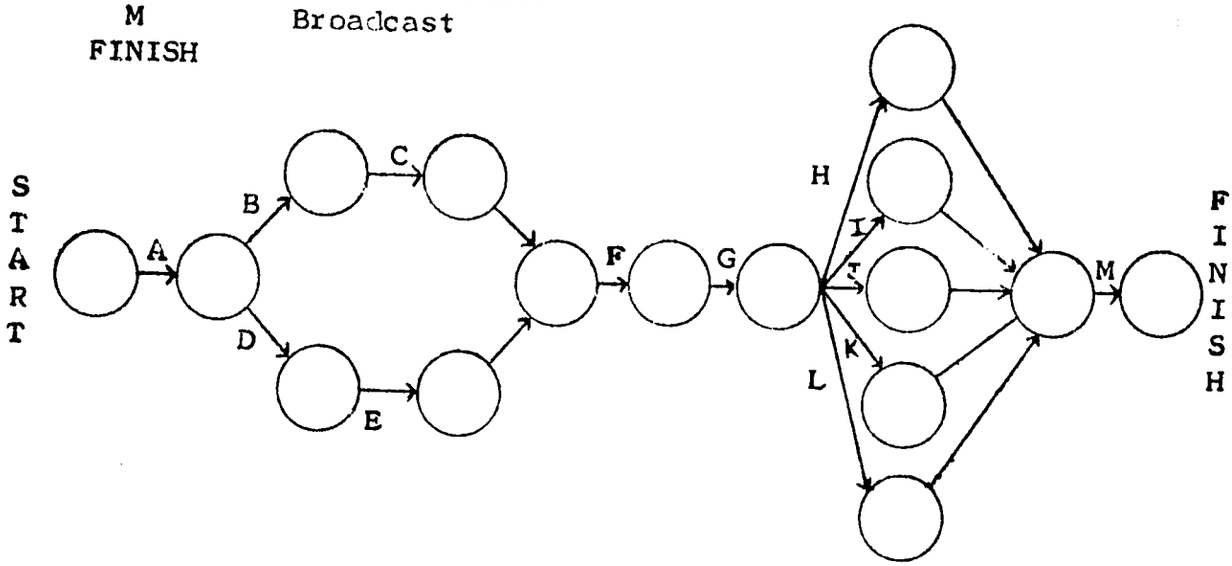
2. A sequence of activities is indicated by linking arrows



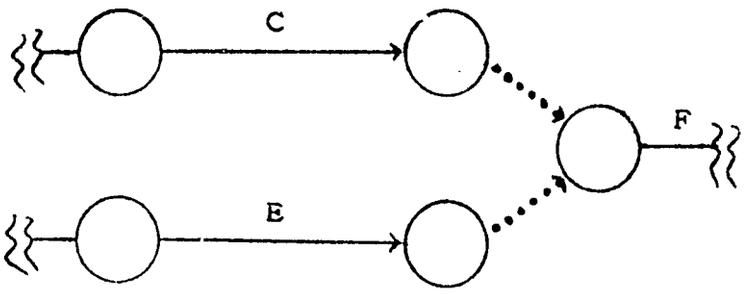
3. A grouping of activities forms a network.

An activity network for the development of an educational broadcasting system is shown below.

NO.	ACTIVITIES
START	Begin Project
A	Recruit Staff
B	Develop Curriculum
C	Test Curriculum (lab)
D	Design Hardware
E	Build Hardware
F	Field Test Hardware and Curriculum
G	Analyze Cost/Effectiveness
H	Construct Transmission Facilities
I	Recruit Production Staff
J	Place Hardware in Schools
K	Distribute Syllabus
L	Train Teachers
M	Broadcast
FINISH	

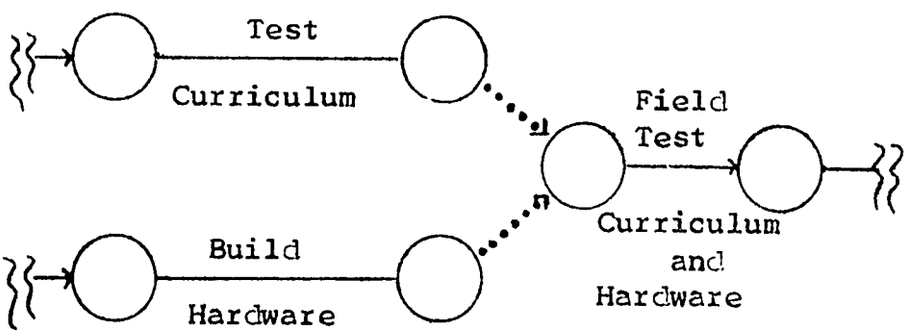


Note that there are some arrows that do not represent real activities. Between C and F and between E and F, there are no activities. The arrows simply connect other activities. These arrows are called "dummies". A better drawing of a "dummy" in a network is to use dotted lines rather than solid lines. For example:

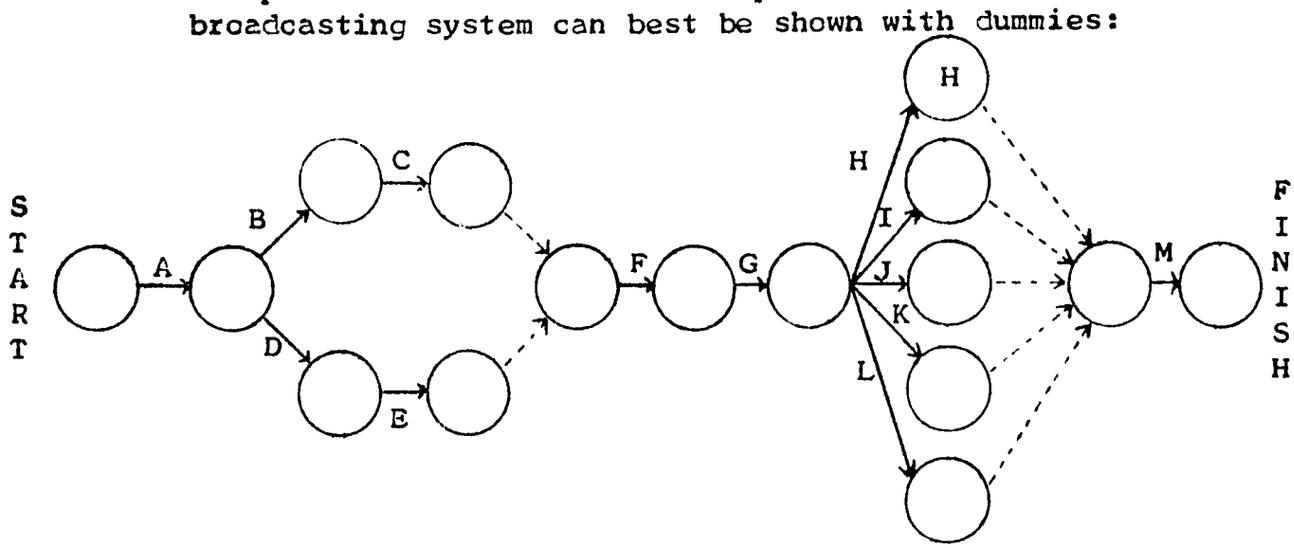


<u>Dummies</u> are dotted-lines. No activity is involved. They are used only to show relationship between events. They are very necessary, however, to show that one activity must be completed before another activity can begin. In the previous example, activities C (Test Curriculum) and E Build Hardware) had to be completed before activity F (Field Test Hardware and Curriculum) could begin.

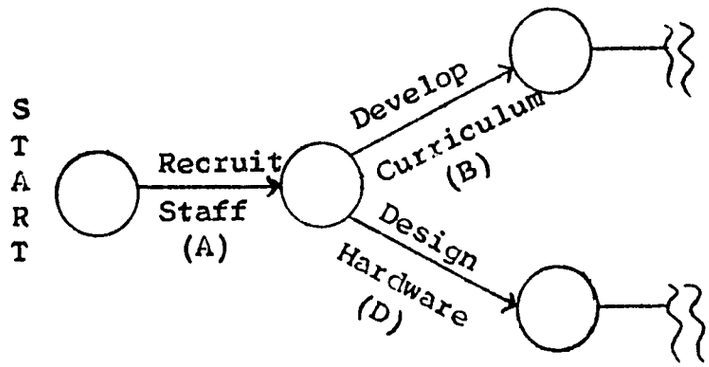
The same example:



The previous network for development of an educational broadcasting system can best be shown with dummies:



Obviously the first step in preparing any network is to <u>list the activities</u>. In our previous example, the relationships and sequence of activities was fairly obvious; certain activities had to be completed before others could begin. For example, we had to "recruit staff" (activity A) before we could either "develop curriculum" (activity B) or "design hardware" (activity D) ... and our network was fairly simple:



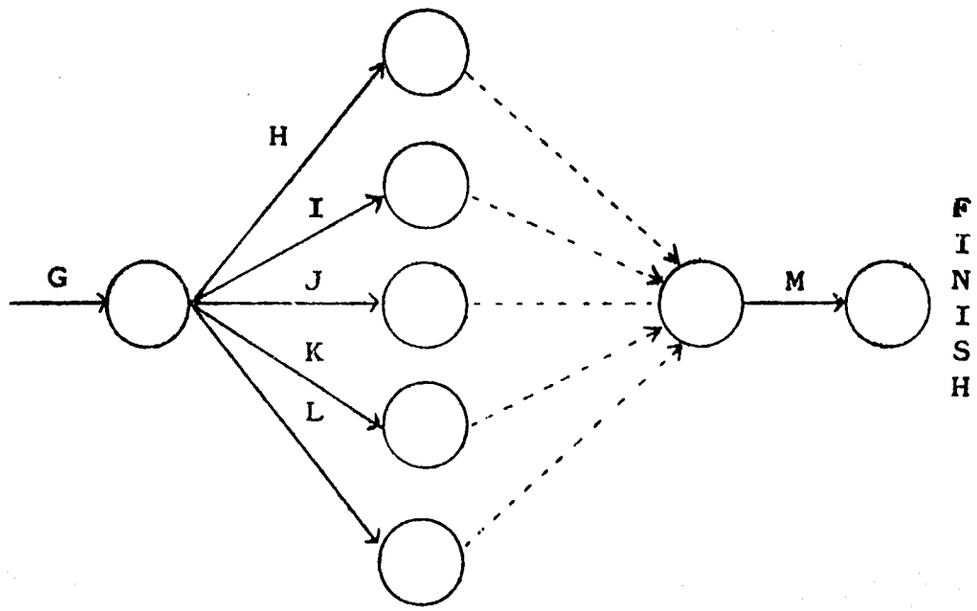
As procedures get more complex, these relationships and requences also get more complex ... and we cannot carry them in our heads. We need a systematic way to list what activities come before what other activities ... What activities must be completed before we can start the next activity. We use the term Preceding Necessary Activities (PNA) to indicate those that must be done before starting on the next activity. And we use an Activity Work Sheet to list activities and to indicate for each are what the PNA's are.

The Activity Work Sheet Below show the PNA's for our previous example on development of educational broadcasting:

ACTIVITY WORK SHEET

	ACTIVITY SUB-ACTIVITY	PRECEDING NECESSARY ACTIVITIES (PNA)
START		0
A	Recruit Staff	START
B	Develop Curriculum	A
C	Test Curriculum	B
D	Design Hardware	A
E	Build Hardware	D
F	Field Test Hardware & Curriculum	C, E
G	Conduct Cost-Effectiveness Analysis	F
H	Construct Transmission Facilities	G
I	Recruit Production Staff	G
J	Place Hardware in Schools	G
K	Distribute Syllabus	G
L	Train Teachers	G
M	Broadcast	H,I,J,K,L
FINISH		M

In drawing a network from an Activity Worksheet, it is usually better to go backward from the finish, thus:



SELF-EVALUATION AND FEEDBACK

SELF-EVALUATION (A)

Below is a list of activities for the production of a module for the three-month course. Fill in the Preceding Necessary Activities (PNA) of the Acting Work Sheet.

ACTIVITY WORK SHEET

ACTIVITY	PRECEDING NECESSARY ACTIVITIES (PNA)
START	
A Discuss Course purposes and decide upon objectives for the module.	
B Review literature related to module objectives	
C Determine format for instruction	
D Determine content and format for the practicum.	
E Write instruction in English	
F Write practicum in English	
G Translate into Thai and French	
H Type English Module and Practicum	
I Reproduce English Module and Practicum	
J Reproduce Thai and French Module and Practicum.	
K Store and label all modules	
FINISH	

FEEDBACK (A)

Below is INNOTECH's listing of PNA's. Yours may be different because they may be based upon different assumptions. That is OK provided that the sequence of activities is logical. Our assumptions:

... It is necessary to review the literature before deciding on the formats for either the instruction or the practicum.

... It is <u>not</u> necessary for the English to be typed before it is translated into Thai and French.

... Translation into Thai and French is done on the complete module (instruction and practicum) at one time.

... Typing of the complete module (instruction and practicum) is done at one time.

... Modules in all languages are stored and labeled at one time.

In any case, here is INNOTECH's list of PNA's:

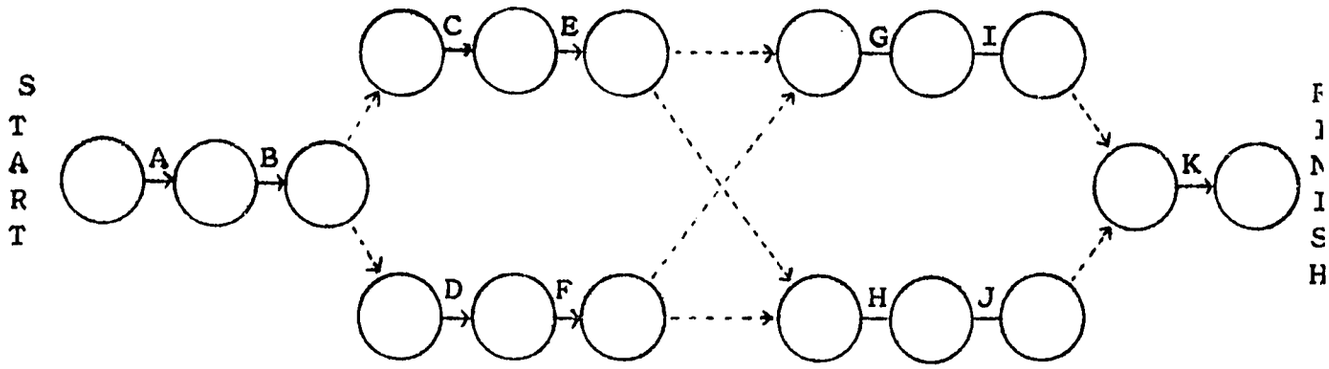
ACTIVITY WORK SHEET

ACTIVITY		PRECEDING NECESSARY ACTIVITIES (PNA)
START		0
A	Discuss Course purposes and decide upon objectives for the module.	START
B	Review literature related to module objectives.	A
C	Determine format for instruction.	B
D	Determine content and format for the practicum.	B
E	Write instruction in English.	C
F	Write practicum in English.	D
G	Translate into Thai and French.	E, F
H	Type English Module and Practicum.	E, F
I	Reproduce English Module and Practicum.	G
J	Reproduce Thai and French Module and Practicum.	H
K	Store and label all modules	I, J
FINISH		K

SELF-EVALUATION (B)

Use the Activity Work Sheet (INNOTECH's) in the previous page. Draw a network below.

FEEDBACK (B)



SELF-EVALUATION (C)

Below is a list of activities. Fill in the "preceding necessary activities" (PNA).

Purpose: Produce Science Textbook for Grade 3

NO.	ACTIVITY SUB-ACTIVITY	PRECEDING NECESSARY ACTIVITIES (PNA)
START	DEVELOP OBJECTIVES	
A	Review present Curriculum	
B	Review Previous Test Results of Children	
C	Review Objectives from other Countries	
D	Determine Appropriate Experts for Objectives	
E	Contact Experts for Meeting on Objectives	
F	Set Dates for Meeting on Objectives	
G	Conduct Meeting on Objectives	
H	Prepare final report of meeting	
I	Submit report to Ministry	
J	Obtain Ministry Approval	
	PREPARE TEXTBOOK	
K	Determine bases for selecting writers	
L	Obtain information on potential writers	
M	Select and employ writers	
N	Employ Illustrators	
O	Employ Science Experts	

NO.	ACTIVITY SUB-ACTIVITY	PRECEDING NECESSARY ACTIVITIES (PNA)
P	Determine format for books	
Q	Determine needed illustrations	
R	Prepare Written Content (draft)	
S	Prepare illustrations (draft)	
T	Convene Review Committee	
U	Review draft of book	
V	Revise draft	
W	Type book in final form	
X	Prepare final illustrations (in colour)	
Y	Type-set for printing	
Z	Proof read	
AA	Design Cover	
	PUBLISH TEXTBOOK	
BB	Determine number of copies	
CC	Estimate number of pages	
DD	Estimate number of Coloured pages	
EE	Obtain bids from printers	
FF	Select printer & give materials	
GG	Review proofs from printer	
HH	Obtain final copies of Textbook	
FINISH		

FEEDBACK (C)

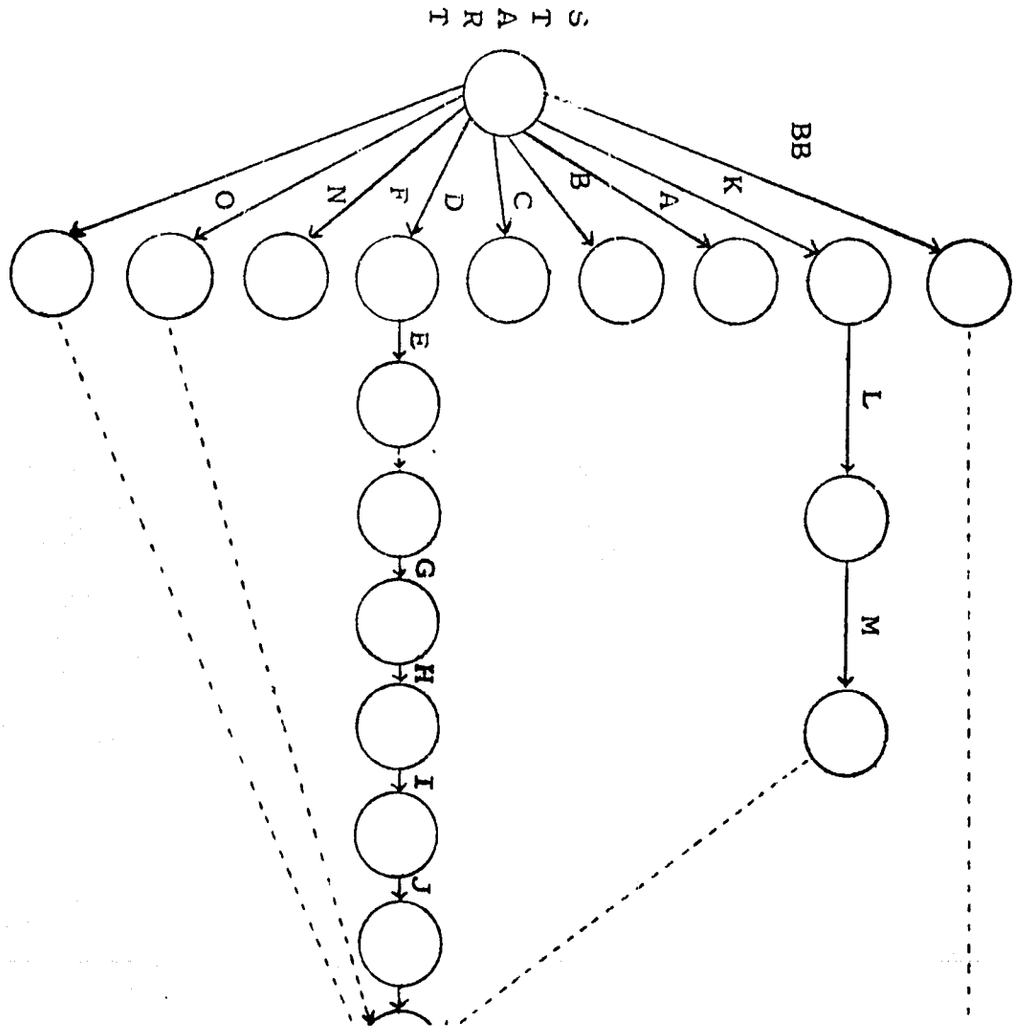
Self-Evaluation (C) asked you to determine the "preceding necessary activities" for a list of activities necessary to produce a science textbook. Although there is no "perfect answer", the following list of Activity numbers and Preceding Necessary Activities (PNA'S) provide an approximate sequence.

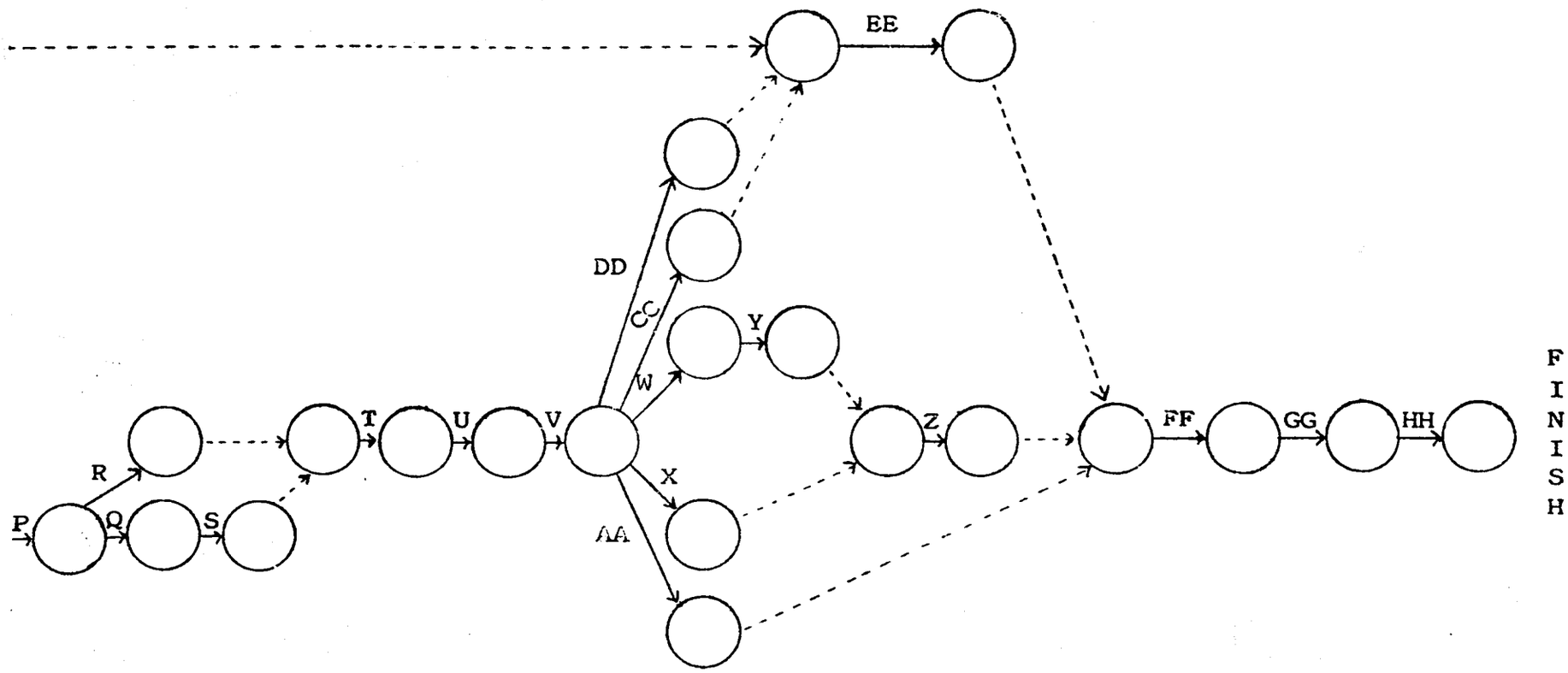
ACTIVITY NUMBER	PRECEDING NECESSARY ACTIVITIES (PNA)	ACTIVITY NUMBER	(PNA)
A	START	S	Q
B	START	T	R, S
C	START	U	T
D	START	V	U
E	D	W	V
F	START	X	V
G	A,B,C,E,F	Y	W
H	G	Z	X, Y
I	H	AA	V
J	I	BB	START
K	START	CC	V
L	K	DD	V
M	L	EE	BB,CC,DD
N	START	FF	Z,AA,EE
O	START	GG	FF
P	J,M,N,O	HH	GG
Q	P	FINISH	
R	P		

SELF-EVALUATION (D)

Get together with several other persons and draw a network for the Activity Work Sheet from the preceding page. The network is quite long so ask the training office for a long sheet of paper.

FEEDBACK (D)




P
R
Q
S
T
U
V
DD
CC
W
X
AA
Y
Z
EE
FF
GG
HH
FINISH

Summary of Network Scheduling

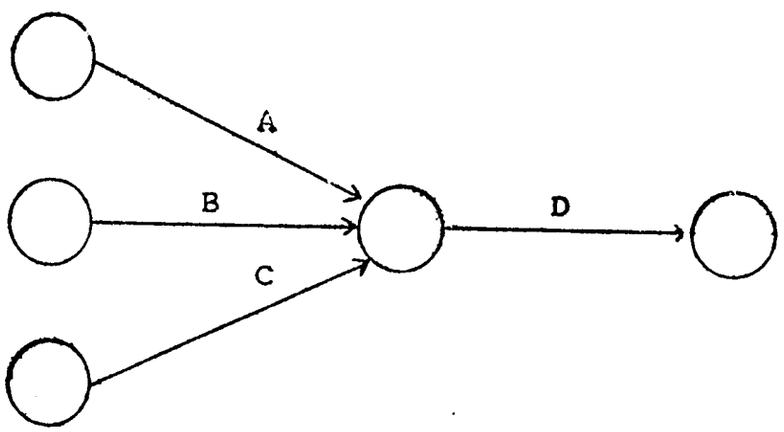
Before going on to the Critical Path Method, it is well to summarize the important points of using networks.

(Basic Rules of Network Logic)

RULE 1. Before an activity may begin, all activities preceding it must be completed.

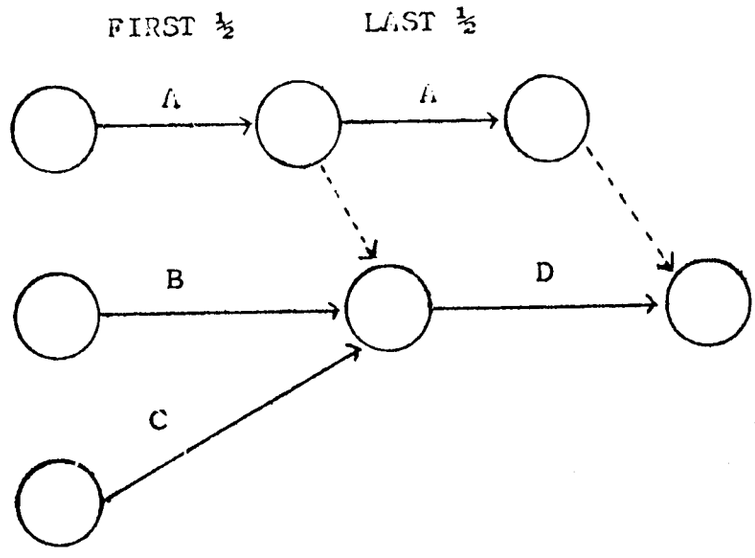
RULE 2. Arrows imply logical precedence only. Neither the length of the arrow nor its "compass" direction on the drawing have any significance.

Rules 1 and 2 may be interpreted by means of the portion of a network shown in the figure below.

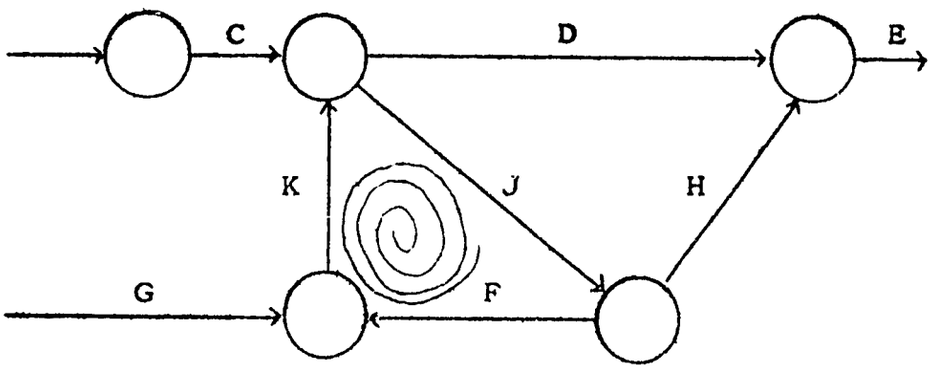


According to Rule 1, this diagram states that "before activity D can begin, activities A, B, and C must be completed". Note that this is not intended to imply that activities A, B, and C must be completed simultaneously.

The most common network error involves Rule 1. As an illustration, consider the diagram of activities A, B, C, and D in the figure on the previous page. Suppose that activity D depended on the completion of B and C and on the completion of the first half of A, completing the second half of A being independent of B, C, and D. To diagram this situation correctly, we must divide activity A into two activities and introduce a dummy activity, as shown in the figure below. The dummy has been used here to correct a problem of false dependency; that is, activity D was only partially dependent on the activities preceding D. False dependencies represent the most subtle networking problems and must be guarded against constantly.

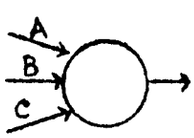


Another network condition that must be avoided is illustrated in the next figure. Activities J, F, and K form a loop, which is an indication of faulty logic. The definition of one or more of the dependency relationships is not valid. Activity J cannot begin until C and K are completed. But K depends on F, which depends on J. Thus J could never get started because it depends on itself. Loops, which in practice may occur in a complex network through oversight, may be remedied by redefining the dependencies to relate them correctly.

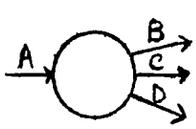


Faulty logic (no way cut).
Loop (caused by faulty logic).

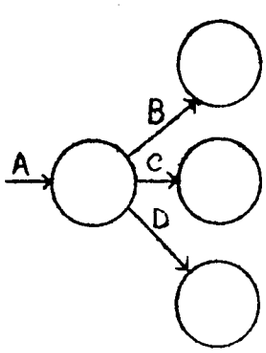
Network Summary:



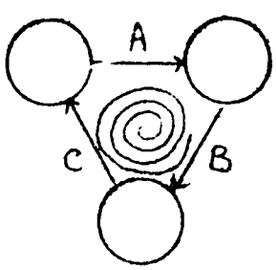
A,B,C must be completed before starting D.



A must be completed before starting B,C,D



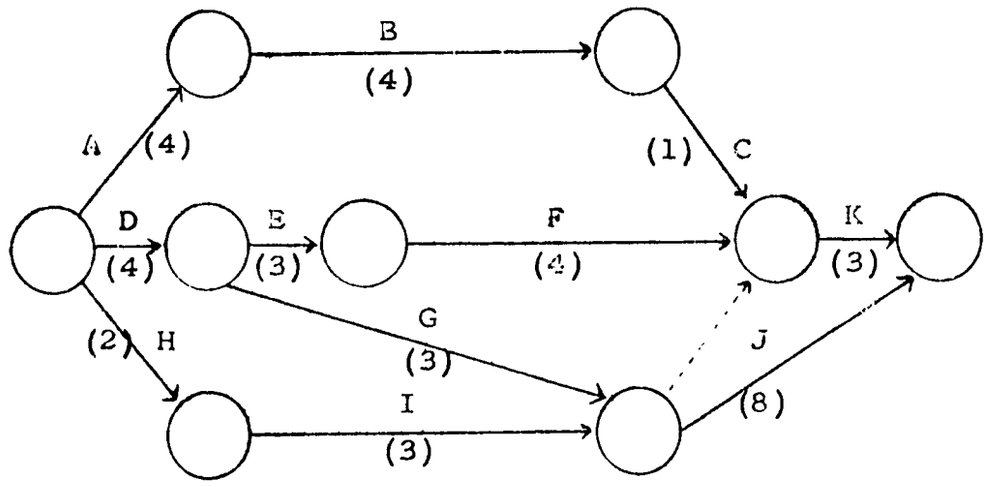
B,C,D do <u>not</u> necessary have to <u>begin</u> at the same time.



Avoid loops.

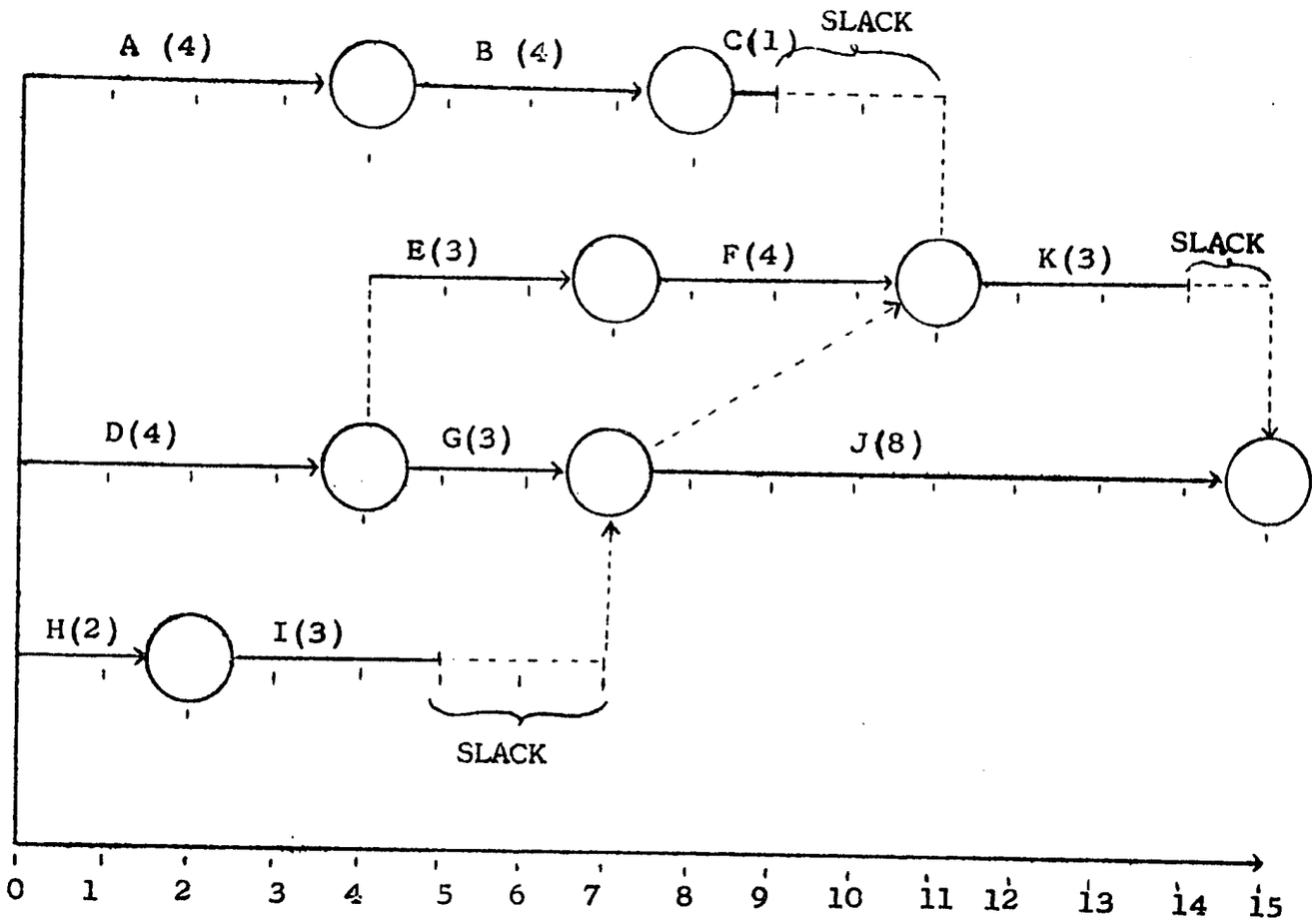
Time-Scaled Networks

In the network below we have estimated how long each activity will take. The time, i.e., number of weeks is given in brackets. For example, "(4)" indicates an estimate of 4 weeks to complete an activity.



The length of any arrow (above) does not indicate the time of the activity. Note that activity "C" takes only 1 week and the arrow is actually longer than activity "K" which takes three weeks. The <u>length of an arrow on a network does not indicate time</u>.

Below is a Time-Scaled Network taken from the diagram on the previous page. In the Time-Scaled Network, the length of an arrow <u>does</u> indicate time.



Note what we have labeled as "slack". Slack time allows a project manager flexibility in beginning an activity. In example, the activities H→I could be started as much as two weeks late (because of the two-week slack time) without affecting total project time. Also note that there is <u>no slack time</u> in the sequence D→G→J. This is the <u>critical path</u>.

The time-scaled network as shown above gives us a lot of information for scheduling:

... The shortest possible time to complete the project is 15 weeks (D→G→J = 15).

... H and I could start two weeks late, if necessary, without hurting the overall schedule since there is two weeks of <u>slack time</u> (Note the dotted horizontal line for activity I).

... A, B and C also could start two weeks late, if necessary, because of the slack time shown on C.

... F and K could start 1 week late, if necessary, because of slack time.

... Any lateness in D, G or J, however, will make the total project schedule longer, because D→G→J is the <u>critical path</u>.

<u>Estimating Activity Time</u>

In estimating an activity's duration time, the activity should be considered independently of activities preceding or succeeding it. For example, one should not say that a particular activity will take longer than usual because the parts needed for the activity are expected to be delivered late. The delivery should be a separate activity, for which the time estimate should reflect the realistic delivery time.

It is also best to assume a normal level of manpower, equipment, or other resources for each activity. Except for known limitations on resources, do not attempt to account for possible conflicts between activities in parallel that may compete for the same resource. These conflicts should be dealt with later, after the scheduling computations have been made.

CRITICAL PATH

What is the Critical Path? It is the sequence of activities which must occur with no delay if the total project is to be completed without a loss of time. There is no slack time in the critical path; each succeeding activity must begin at the time that the preceding activity is completed. Look back at the time-scaled network on page 36. The sequence of activities: D G J form the critical path. There is no slack time in this sequence, and if there is any lost time here the whole project will take longer.

The calculation of the critical path allows as also to calculate other paths in the network that do have slack time ... meaning that we can start these activities later if we so desire. But the critical path is critical because there is no slack time.

Before we get lost in the mechanics of deriving the critical path, you should know that we will end up calculating:

(a) earliest start time for each activity

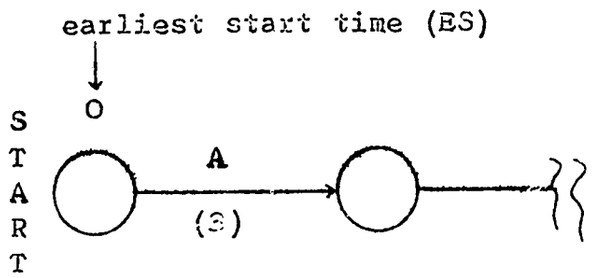
(b) latest start time for each activity

(c) earliest completion time for each activity

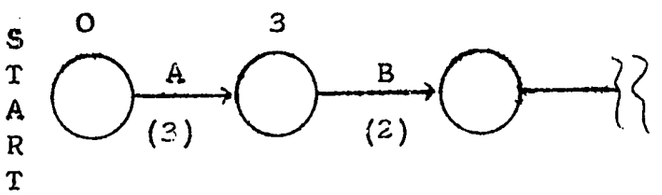
(d) latest completion time for each activity

(e) total slack time for each activity

There are two basic ways to determine the critical path of a network: (1) The first method is simply to enumerate the possible paths, determine the time length of each path, and select the path with the longest time as the critical path. While this method is straightforward for simply networks, it can become laborious for complex networks. (2) The second approach is conceptually more difficult, but it is a systematic procedure for finding the critical path in complex networks. Starting at the beginning of the network, determine the earliest start time (ES) for each event in the program. Since the first event must occur before any succeeding activities can begin assign it an earliest start time of zero.



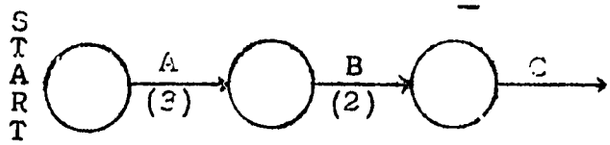
The ES for activity A is zero.
Add to this time the duration of the activity leading to the next activity; this yields the ES for that succeeding activity, thus:



the ES for activity B is 3 as a result of

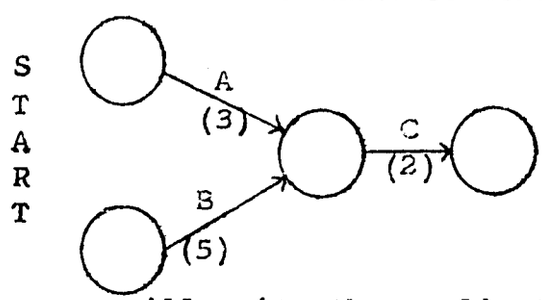
$$0 + 3 = 3.$$

If several activities lead to another given activity then its ES is the highest value obtained by adding the duration of its predecessor activity to the ES of the activity's beginning event. As shown below the ES for activity C is 5 .

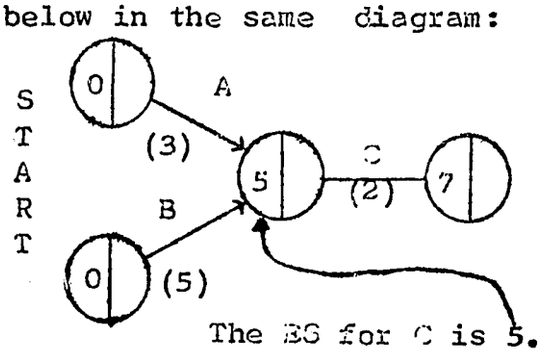


0 + 3 + 2 = 5

When an event is a part of two or more paths, the longest path to the event must be completed before any subsequent events can be started. The ES for C, below, is 5 because B must be finished before C can start.



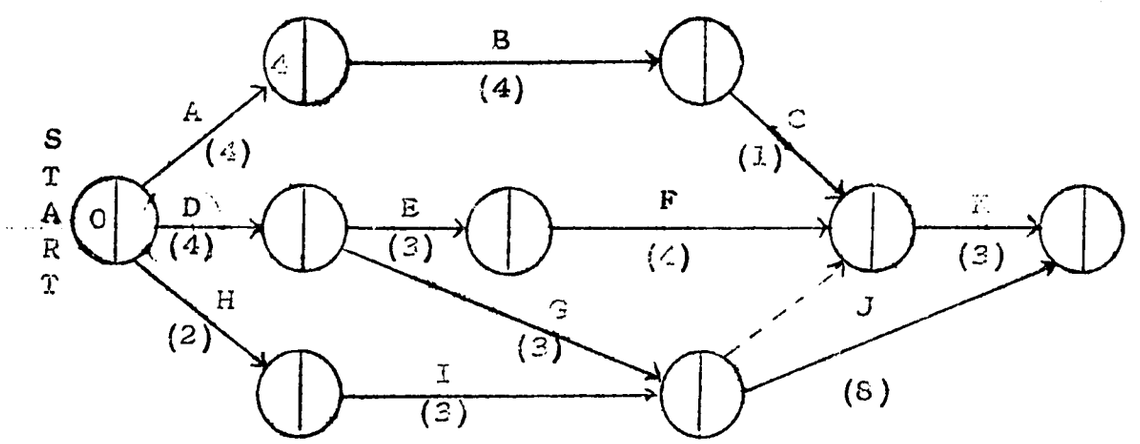
For convenience, we will write the earliest start times (ES) in the circle beginning an activity. Note the ES's below in the same diagram:



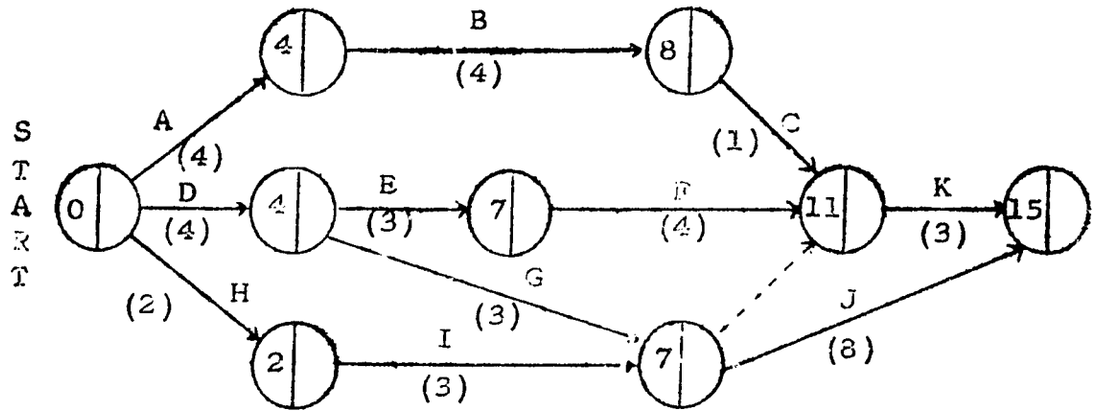
The calculation of ES is called the <u>forward pass</u> in the critical path method.

SELF-EVALUATION (B)

Calculate the earliest starting times below by doing a forward pass. Note that the ES for A, D and H are entered as "0". The ES for E is 4.



FEEDBACK (E)



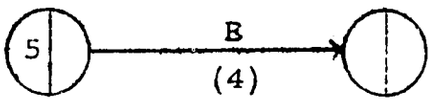
Note: Look at the ES for "J". H plus I = 5, but D plus G = 7. Therefore, the ES is 7 because it cannot begin until both I and G are completed. The longest time is the ES.

Look at the ES for "K". There are four possibilities:

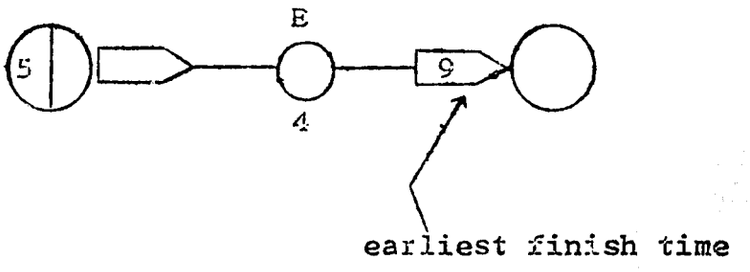
A + B + C = 9
D + E + F = 11
D + G = 7
H + I = 5

The ES, therefore, is 11 ... the longest time ... because all these activities must be completed before K can begin.

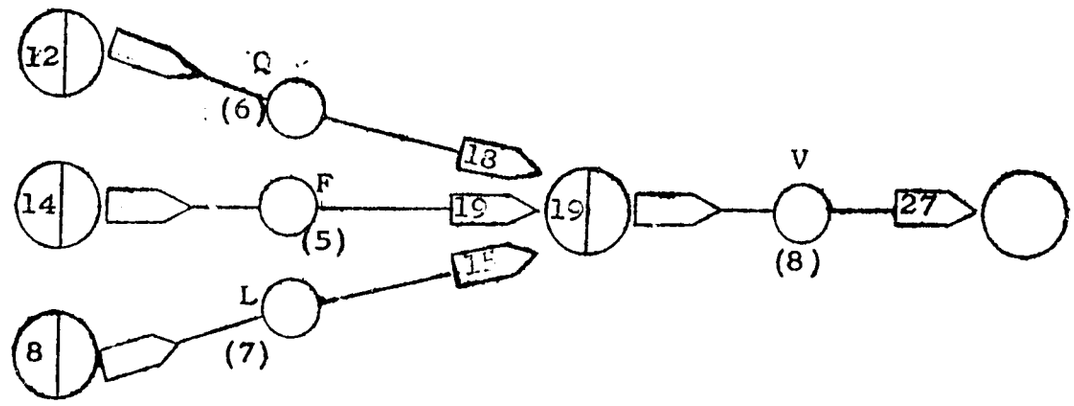
After completing the forward pass, we have the <u>earliest start times (ES)</u> for each activity. By simply adding an activity time to its ES, we also will know the <u>earliest possible finish time</u> for that activity. In the example below the earliest finish time is 9 (5 plus 4).



We are going to start a new system of notations now.



This notation helps us when we have a large number of activities which must be completed fore another activity can begin.

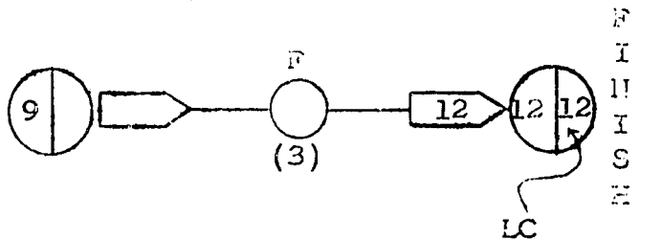


We simply take the largest value for earliest <u>finish</u> times of preceding activities to be the earliest <u>starting</u> time for the next activity. Note that the earliest <u>finish</u> times are:

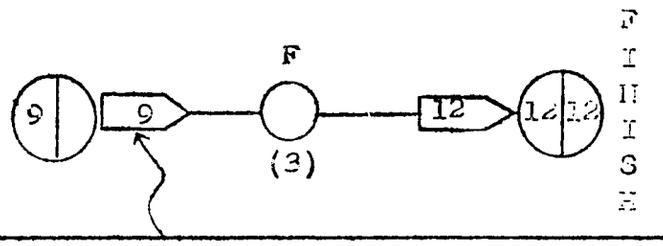
Q = 18
F = 19
L = 15

Therefore, the earliest <u>starting</u> time for V is the largest value: 19.

To determine the critical path, we must know not only the ES but also the latest completion time (LC) (without causing delay). This calculation is done by way of a backward pass, beginning at "finish". The LC for the last activity is the same as the ES at that point because we want the earliest and latest must be the same at the finish if we are to finish as early as possible.

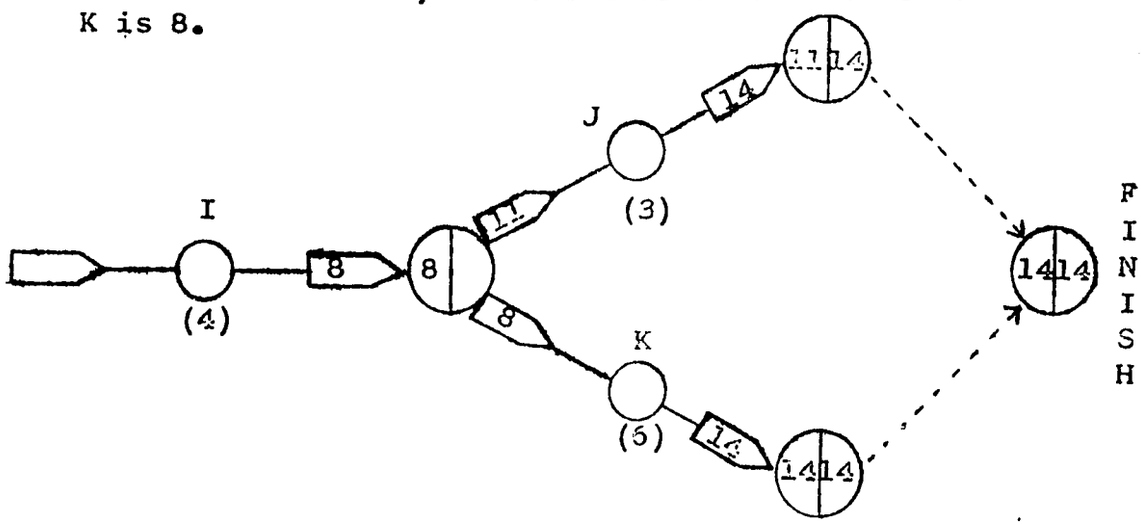


The essentials of the backward pass are to subtract the activity time from the LC.

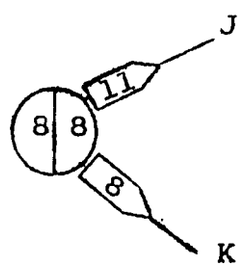


This subtraction gets us the latest start time (without delaying the total schedule). It is entered here.

Note in the diagram below, that the latest start time for "J" is 11, and the latest start time for K is 8.



What is the latest completion time (LC) for "I"? It is the latest that you can complete "I" without delaying subsequent activities. It is the smallest of the two numbers indicating latest start times.



Because the latest completion time cannot exceed the latest start time of the next activity or there will be a delay.

Up to now we have calculated:

... earliest start time

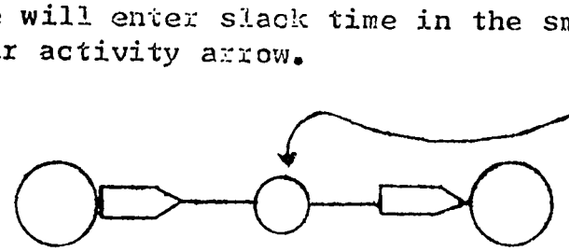
... earliest completion time

... latest start time

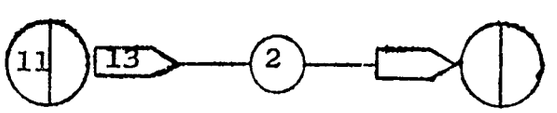
... latest completion time.

All that remains is to calculate "slack time".

We will enter slack time in the small circles of our activity arrow.

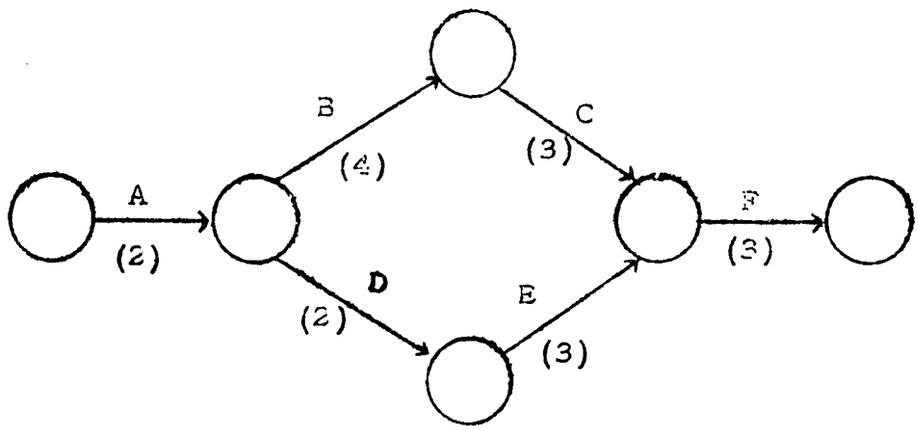


Slack time is calculated by the <u>difference</u> between the earliest and latest start times.

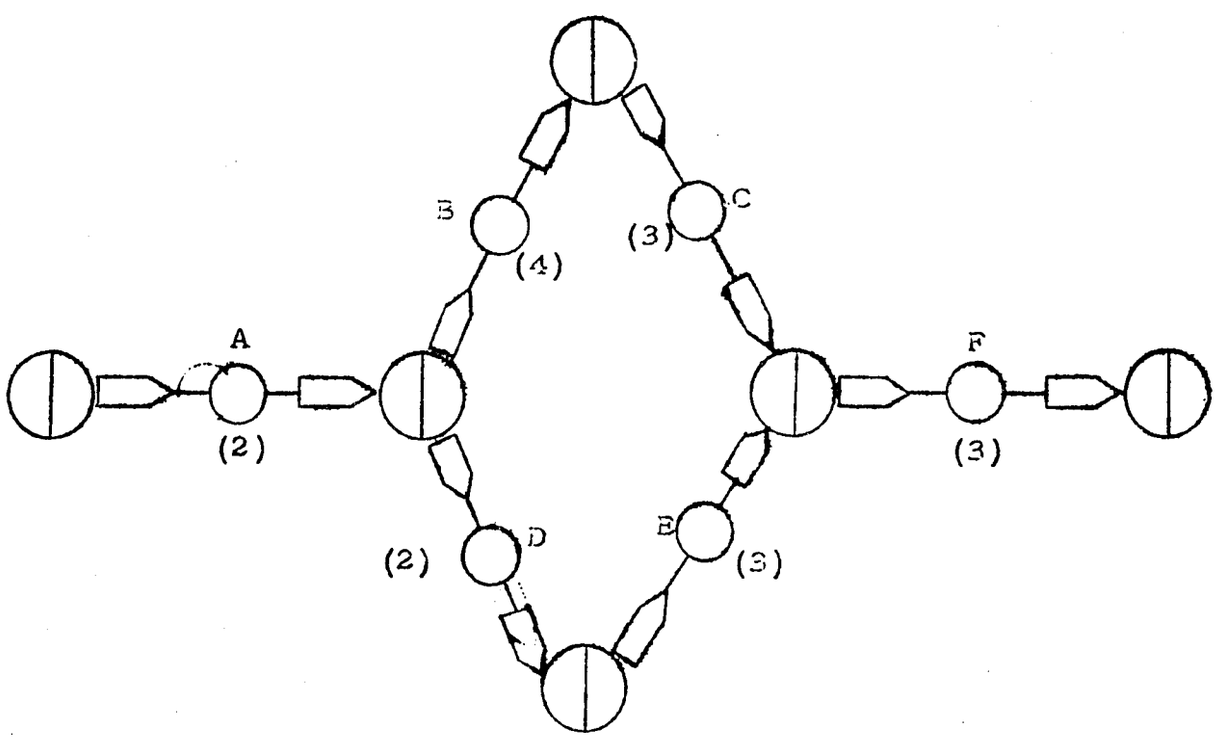


The slack time (2) above is calculated by subtracting the earliest start time (11) from the latest start time (13).

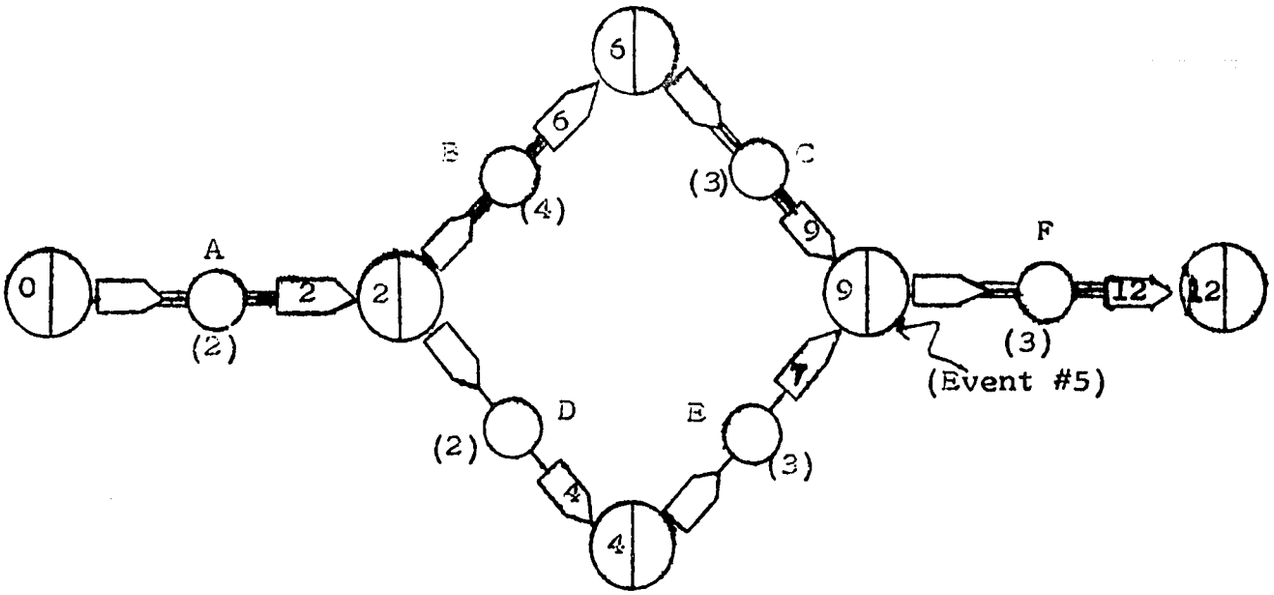
Now let us practice a simple network together.



Let us now translate this network into the new notation system.

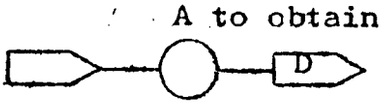


With this information, we make a forward pass.



The critical path is the darker line. Note what happened at event No. 5. Of the two numbers leading to it (7 and 9), the largest was entered in the event. It represents the earliest start time for the next activity.

is always added to A to obtain

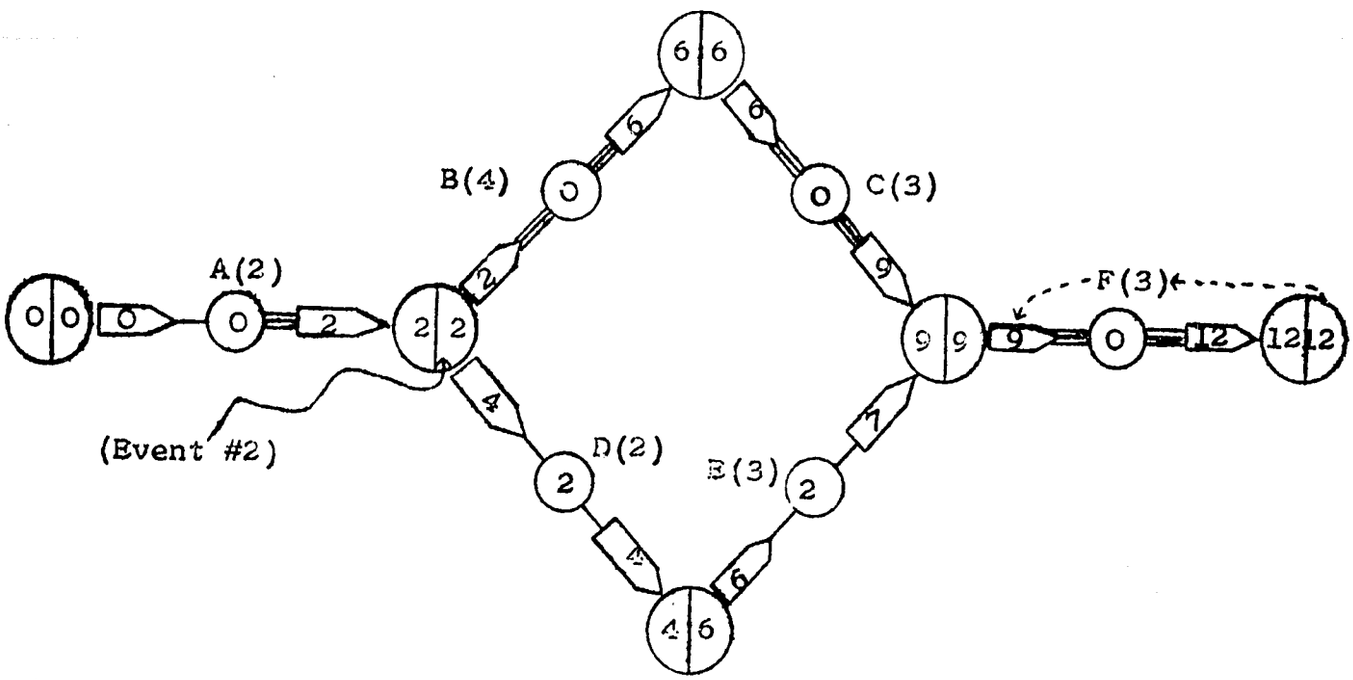


(F + A = D)

In words:

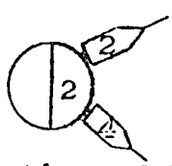
earliest start time plus activity time equals earliest finish time.

Let us now add the <u>backward pass</u> to the previous network.

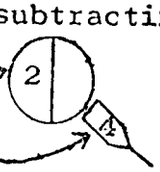


a) Note that the <u>critical path</u> has no slack, i.e. all —(0)— 's. It is A→B→C→F.

b) Note at event No. 2 that the smaller of the two values was chosen as the latest start time:



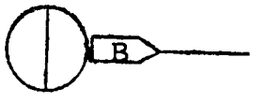
c) Also note the slack time of 2 for activity "D". It was calculated by subtracting the earliest start time from the latest start time.



Remember that

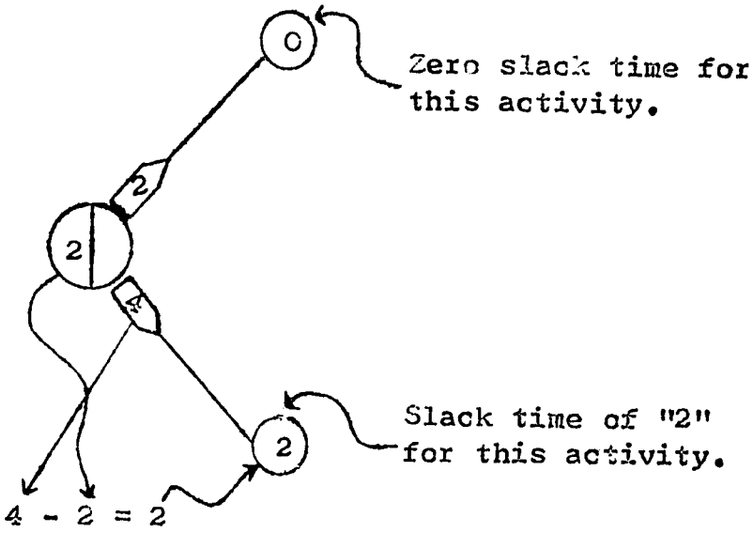
is the <u>earliest start time</u>.

and

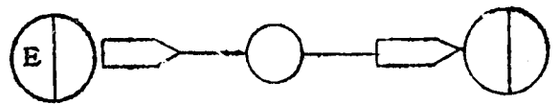
that 

is the <u>latest start time</u>.

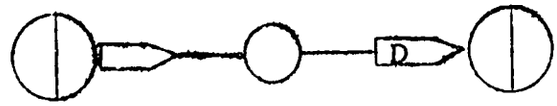
The difference between the <u>earliest</u> and the <u>latest</u> start times is the total slack of an activity.



Summary of Notations



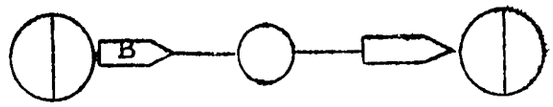
earliest start



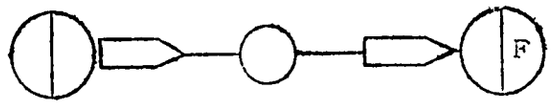
earliest finish

Forward Pass

earliest start plus activity time = earliest finish



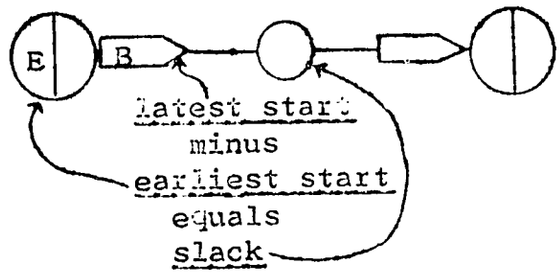
latest start

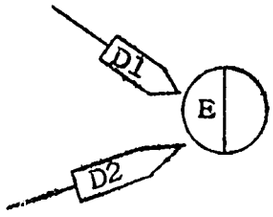


latest finish

Backward Pass

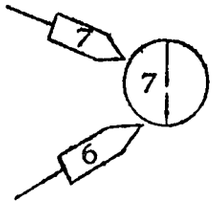
latest finish minus activity time = latest start



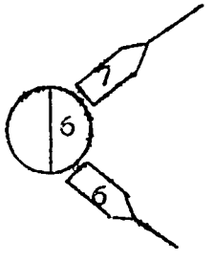


In a <u>forward pass</u>, when two activities converge on an event, enter the <u>larger</u> of the earliest finish times (D_1 and D_2) as the earliest start time for the next activity.

For example,



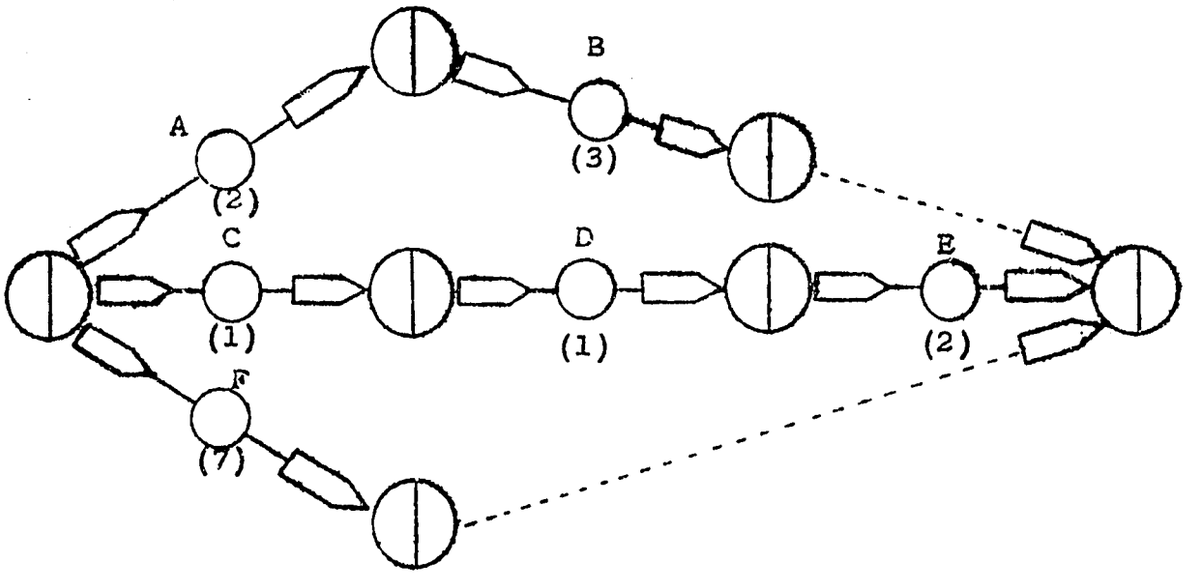
enter the larger number, "7".



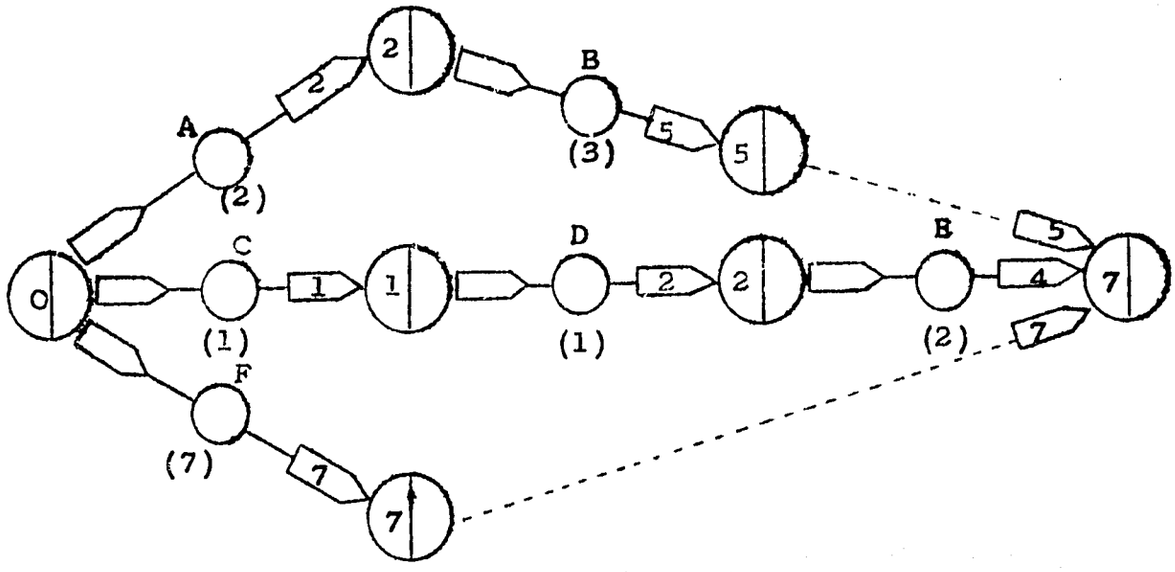
In a <u>backward pass</u>, enter the <u>smaller</u> of the latest start time.

SELF-EVALUATION (F)

Compute the earliest start (ES) and earliest completion times (EF) below.

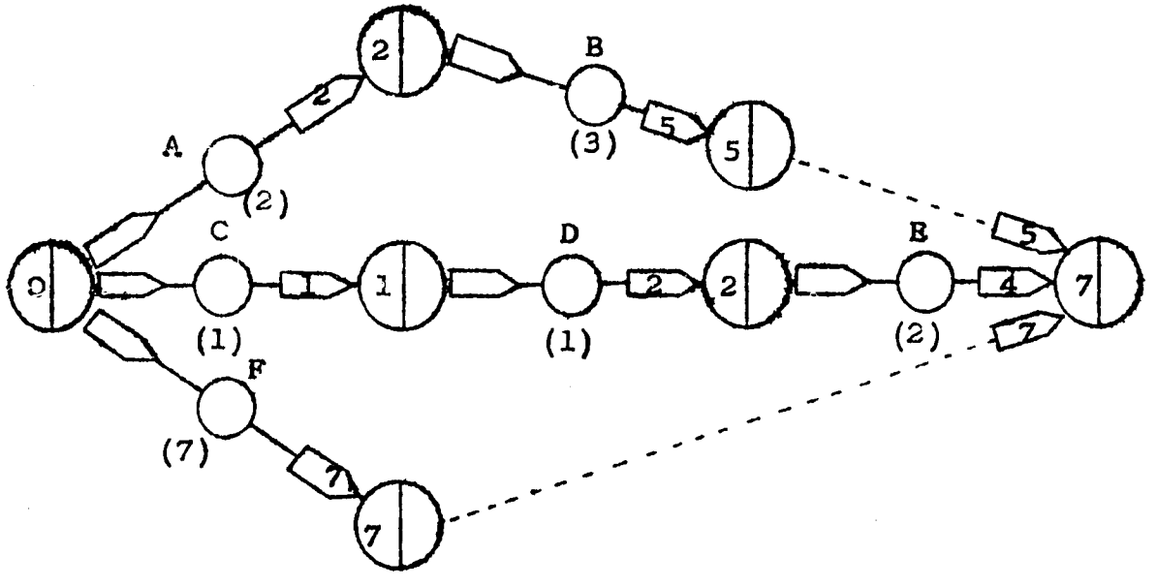


FEEDBACK (F)

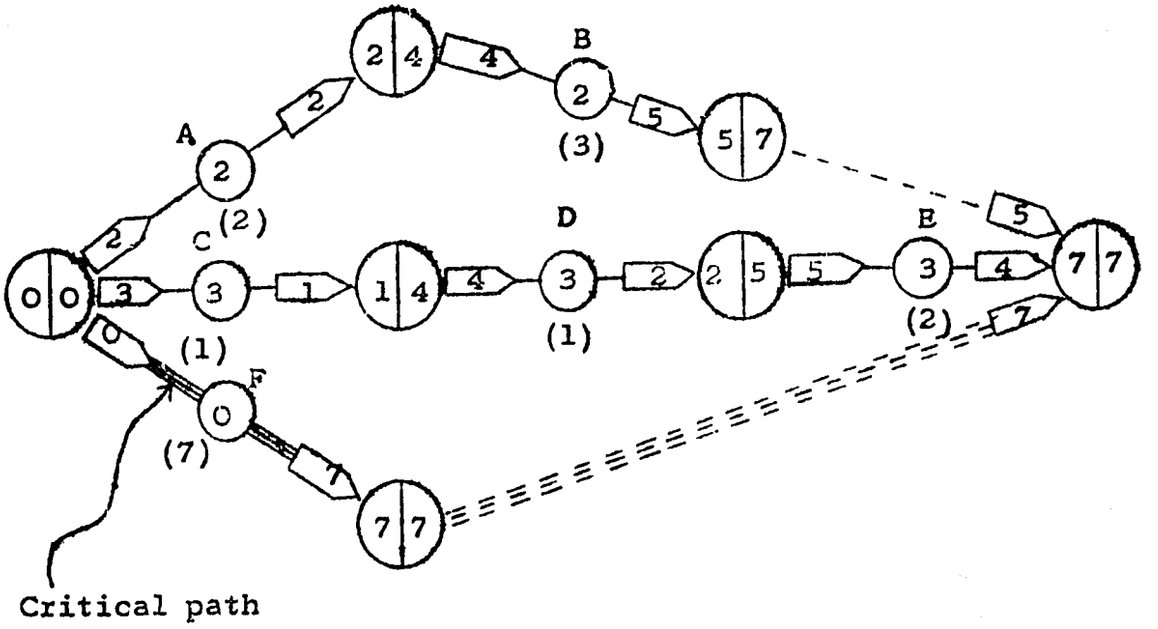


SELF-EVALUATION (G)

Now do a backward past and compute latest start times, latest completion times and slack. Indicate the critical path by a heavy line.



FEEDBACK (G)

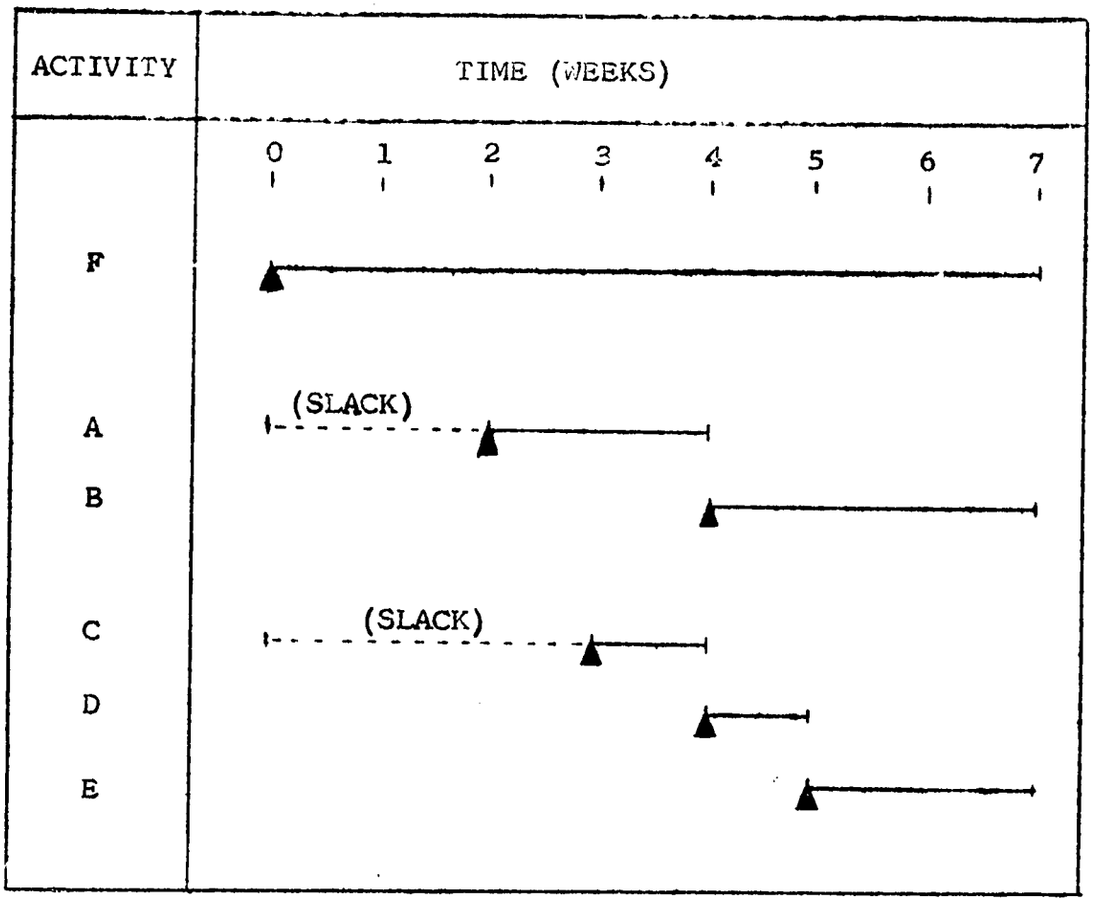


From the feedback on the previous page we can derive a SLACK TIME TABLE as below:

ACTIVITY	EARLIEST START	EARLIEST FINISH	LATEST START	LATEST FINISH	SLACK	CRITICALITY
F	0	7	0	7	0	CRITICAL PATH
A	0	2	2	4	2	NEXT CRITICAL
B	2	5	4	7		
C	0	1	3	4	3	LEAST CRITICAL
D	1	2	4	5		
E	2	4	5	7		

From the table above, we can then draw a <u>Start and Finish Schedule</u>, as shown on the next page.

START AND FINISH SCHEDULE



▲ = Start on or before this time.

The above is your schedule based upon the Critical Path Method. Things that you know from this schedule:

... You must start activity F immediately.

... You may start the A→B sequence immediately, but you may wait two weeks. However, you must start after two weeks.

... You may start the C→D→E sequence immediately, but you may wait three weeks.
However, you must start after three weeks.

POST MODULE PRACTICUM

Below is an Activity Work Sheet. Obtain a large sheet of paper and a circle template from the training office.

1. Draw an activity network (rough sketch).
2. Redraw network using all symbols (ES, LC, etc.)
3. Calculate Critical Path.
4. Prepare a SLACK TIME TABLE (see page 59).
5. Prepare a Start and Finish Schedule (see page 60).

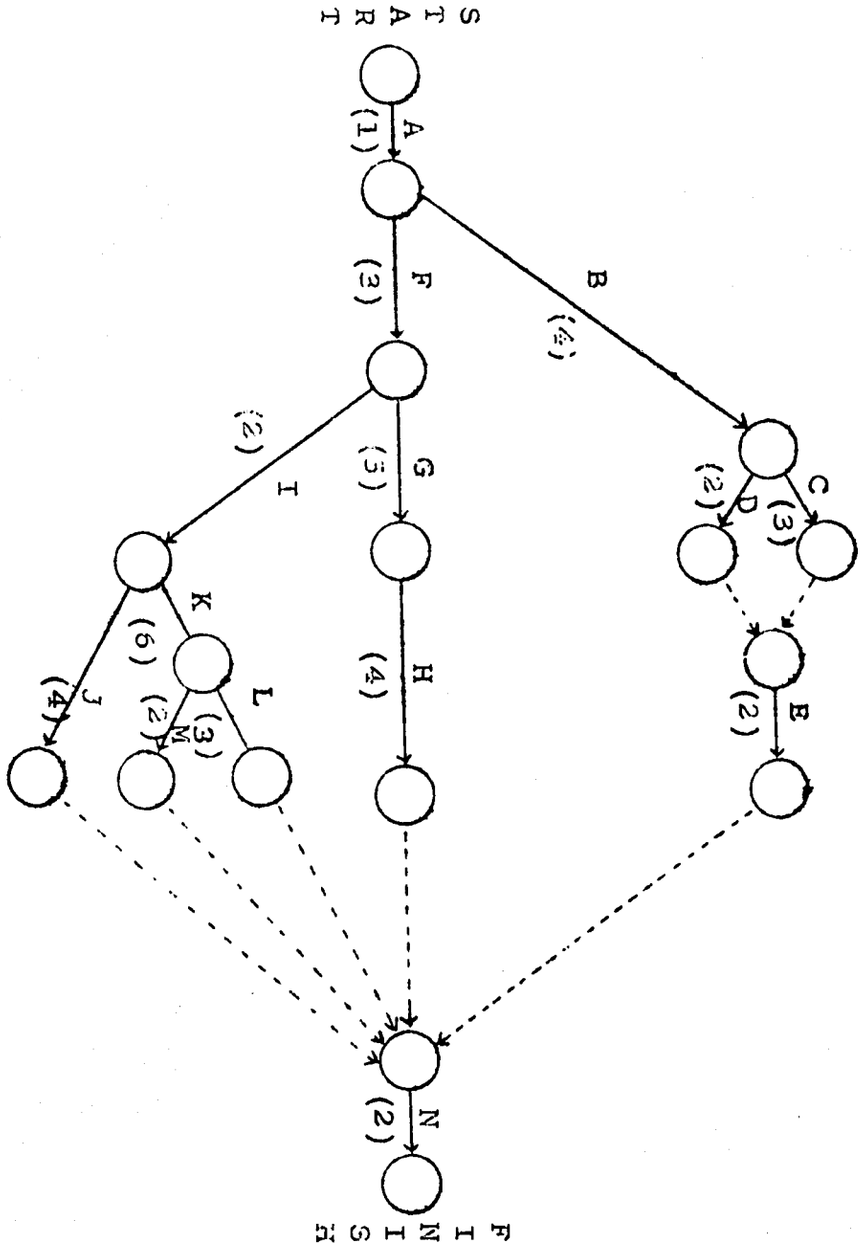
ACTIVITY WORK SHEET

ACTIVITY	ACTIVITY TIME (WEEKS)	FNA
START		0
A	1	START
B	4	A
C	3	B
D	2	B
E	2	C,D
F	3	A
G	5	F
H	4	G
I	2	F
J	4	I
K	6	I
L	3	K
M	2	K
N	2	E,H,L,M,J
FINISH	-	N

GOOD LUCK !

FEEDBACK FOR PRACTICUM

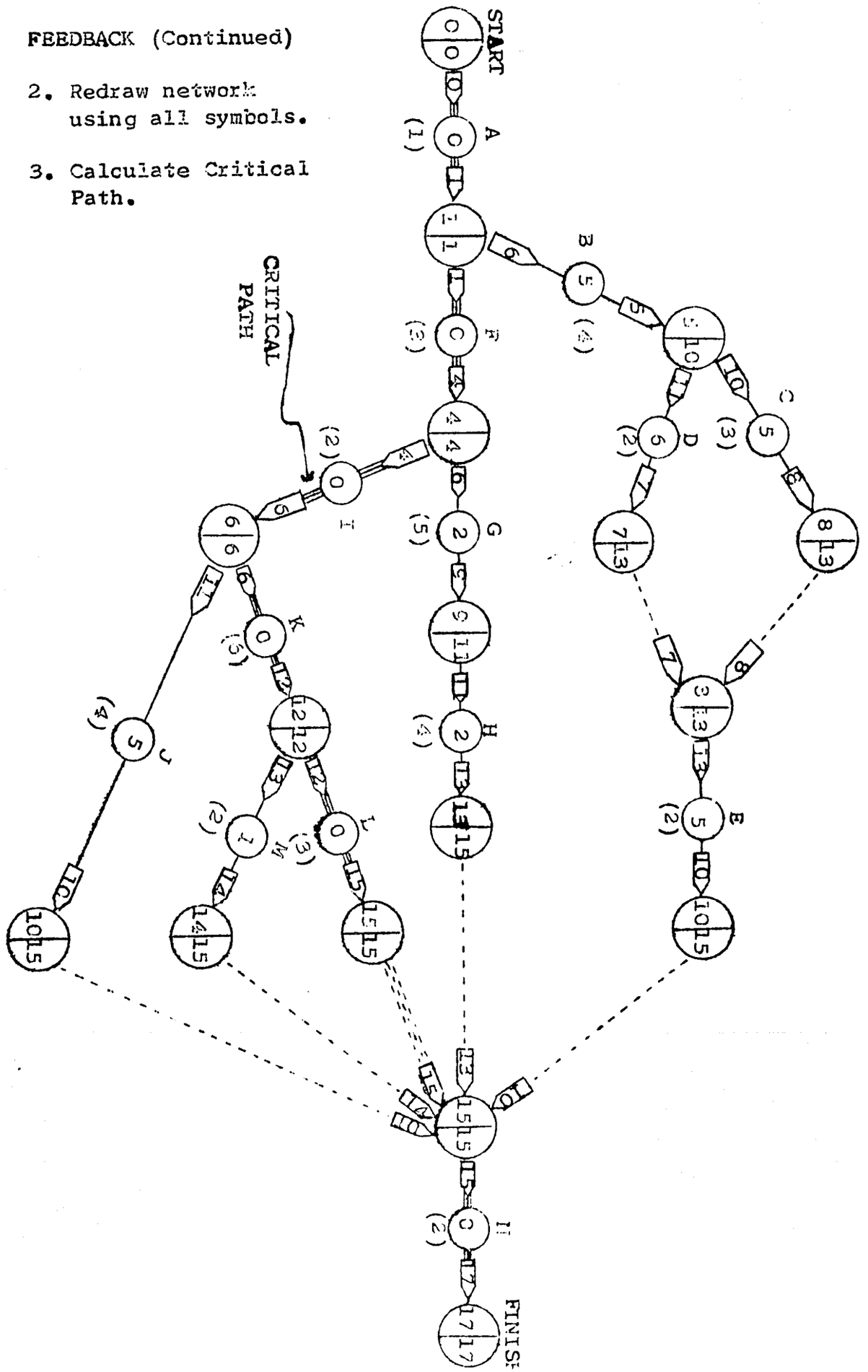
1. Draw an Activity Network (rough sketch)



FEEDBACK (Continued)

2. Redraw network using all symbols.

3. Calculate Critical Path.



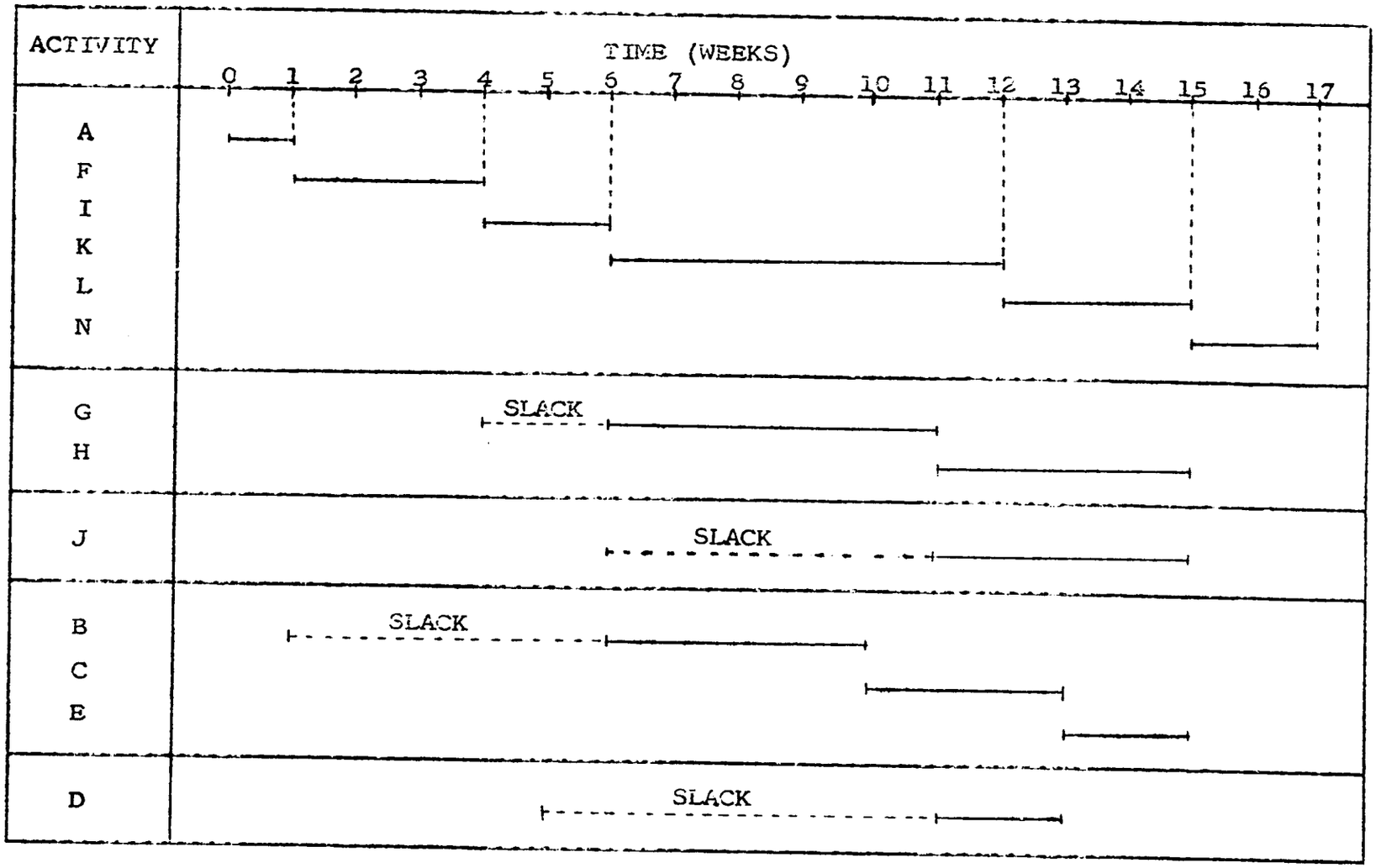
FEEDBACK (Continued)

4. Prepare a Slack Time Table

ACTIVITY	EARLIEST START	EARLIEST FINISH	LATEST START	LATEST FINISH	SLACK	CRITICALITY
A	0	1	0	1	0	CRITICAL PATH
F	1	4	1	4		
I	4	6	4	6		
K	6	12	6	12		
L	12	15	12	15		
N	15	17	15	17		
G	4	9	6	11	2	
H	9	13	11	15		
J	6	10	11	15	5	
B	1	5	6	10	5	
C	5	8	10	13		
E	8	10	13	15		
D	5	7	11	13	6	LEAST CRITICAL

FEEDBACK (Continued)

5. Prepare a Start and Finish Schedule.



ERRATA
(MODULE 29)

p.7	line 17:	written	and of it? ...
		read	all of it? ...
p.8	line 18:	written	purpose assessed by ...
		read	purpose is assessed by ...
p.39	line 11:	written	allows as also ...
		read	allows us also ...
p.50	line 3:	written	at even no. 5
		read	at the start of activity F.
	line 4:	written	in the event.
		read	as the earliest start time.

Delete the whole sentence: it presents .....
..... next activity.

p.51	line 4:	written	event No. 2
		read	circle No. 2

SERIES 5

MODULE 30

COUNTRY REPORT

INNOTECH

MODULE 30

PREVIEW

In the course of this training program, you have utilized the systems approach in developing a potentially effective solution to an actual educational problem in your country and have mapped out an acceptance strategy for your proposed solution. These you have accomplished through cooperative work with other members of your country team and through some ideas contributed by fellow participants from other countries.

In this Module which will be in the form of large-group discussions your country team will formally present your team's work on your national problem.

OBJECTIVE

In this Module each country group should be able to deliver a report on their selected national problem that shall include the following:

a. a statement of the problem and its background.

b. the general and specific objectives formulated to solve the problem.

c. the pertinent resources and constraints.

d. a clear description of the selected alternative and of the process by which it was evolved.

e. a brief description of proposed strategies for acceptance of the selected alternative.

CORE INSTRUCTIONAL ACTIVITIES

1. Meet with the other members of your country team and cooperatively prepare to deliver your report. The report should contain the following:

   a. The problem, its background and an explanation of why it was chosen (Refer to Practicum of Module 17).

   b. The general and specific objectives (Refer to Modules 18 and 24).

   c. Resources and constraints (Module 19).

   d. A description of the selected alternative and of the process by which it was selected and modified. (Module 25)

   e. A brief description of the acceptance strategies planned. (Module 28)

2. The delivery of the country report during the large-group sessions may be shared by the different members of the country team. If the team so desires, however, one member may be selected to deliver the entire report.

3. Be ready to entertain comments, questions and other reactions from your fellow participants after delivering your report.

GOOD LUCK TO YOU !

SERIES 5

MODULE 31

SEMINAR ON REVIEW AND REVISION OF THE SYSTEMS MODEL

INNOTECH

MODULE 31

PREVIEW

Modules 11 to 14 provided the rationale for a systems approach to our educational problems, a number of interpretations of the systems approach, and the relationships of its components. In Module 15 you demonstrated mastery of the concepts presented in earlier modules by first designing your own systems model, then by working cooperatively with fellow participants and developing a systems model that reflects the thinking of the group. In the succeeding modules you actually applied the systems approach to develop innovative solutions to your National and on-the-job problems.

The experience you have gained since your Model Building Seminar may have given you new ideas on the Systems Approach that you would like to incorporate in your model. This Seminar will be held for this purpose.

OBJECTIVES

The participant, in cooperation with other members of his group shall:

a. Describe the modifications the group has made on their systems model, explaining the modified components and their relationships as well as the rationale for such modifications, or

b. if no modifications have been made, discuss the reasons for not making any changes in the light of the experience gained in their actual application of the systems approach.

CORE INSTRUCTIONAL ACTIVITIES

a. Meet with the other members of the team that created your group systems model in Module II. Study the model your group created and suggest any changes or modifications that you think should be made. The team should study all suggestions and come to an agreement on revisions. As soon as the sketch of the revised model is ready, give a clean copy to the AVA Department for reproduction.

b. During the large-group discussion a spokesman of your team will present the model as revised, explaining the modifications made and the reasons for the modifications. In the event that the team elected to adopt the model it was originally created without any revision, the reason for this action should likewise be explained.

The members of the team may answer questions that may be raised by other participants and in turn raise questions that may need to be raised for further clarification when other teams are presenting their models.

GOOD LUCK !

SERIES 5

INSTRUMENT FOR EVALUATING INNOVATIONS

DIRECTIONS FOR USE

INNOTECH

Adopted from Original Material
by The Office of Educational Development
Indonesia

Introduction

The original IEI was developed by the Indonesian Office of Educational Development to screen a large number of potential innovations for use in that country. It was used, however, not only to select potential innovations but also to adapt and change them so that they would be more appropriate for use in Indonesia. These two uses (selection and adaptation) also are the main function of the IEI at INNOTECH.

Selection is the process of evaluating a number of possible innovations for the solution of a given problem.

Adaptation is the process of changing the innovation so that it takes advantage of a country's resources and overcomes a country's constraints.

Description of the IEI (Refer to the IEI Questionnaire)

The IEI is divided into six general areas to be considered in selecting and adapting of an innovation. The areas are:

I. Costs

II. Time

III. Funding (Obtaining money)

IV. Policy and Organization

V. Cultural & Community Acceptance and Support

VI. Effects

Within each area, a set of questions are asked about the innovation. For example,

... under costs, one question concerning the innovation is
"Are additional teachers required?" (by the innovation).

... under time, one question is
"Will time be needed to recruit staff?"(for the innovation).

... under funding, one question is
"Can money be secured from external funding agencies?"
(for the innovation)

... under Policy and Organization, one question is
"Is the innovation in agreement
with Ministry of Education Policy?"

... under Cultural and Community Acceptance and Support, one question is
"Will the innovation work without translation
into the local language?"

... under Effects, one question is
"Has the innovation been effective somewhere else?"

Use of the IEI

For each question, you will have to decide whether the innovation can make use of available resources or whether it will be difficult to develop because of possible constraints.

A resource means that the innovation is a positive asset in relation to your country and to your country's ability to develop and use the innovation.

A constraint means that the use of the innovation may be difficult because of limitations in your country.

Some examples:

Under costs, one question is "Will new instructional materials be required?" An innovation may make use of available resources if no new materials are needed for the innovation, if there is money available, or if new instructional materials of some kind are already planned, or if you think it would be easy to secure funds or materials, etc. An innovation may run counter to constraints if much new instructional materials are needed and if your country does not have the resources to develop or obtain them.

Under time, one question is "Will development and training time be required?" One resource may be that your country already has a system of training that could be used. One constraint may be that your country would have to set up a new training course and that it would take a lot of time to do so.

For each question in the IEI, there are two main columns. The first is titled Resource or Asset, and the second is titled Constraint or Liability. A third column is titled not Applicable, meaning that the question is not appropriate either to the innovation or to your country. The first step in the use of the IEI is to think about the innovation (in your country) and to check (✓) the column that you think is appropriate. Then, beneath the question, you should give a short explanation (only if necessary) of the reasons for your answer.

For example:

	Resource or Asset	Constraint or Liability	Not Applicable
Is extensive building or remodelling time required?	√		

Explanation: Make use of existing classrooms with very few changes.

- or -

	Resource or Asset	Constraint or Liability	Not Applicable
Is extensive building or remodelling time required?		√	

Explanation: Requires time (up to one year) to remodel one classroom in each school for use as a multi-purpose room.

- or -

	Resource or Asset	Constraint or Liability	Not Applicable
Is extensive building or remodelling time required?			√

Explanation: Innovation does not require buildings.

SUMMARY:

Consider each question about the innovation in relation to your own country. Make a check (√) in one of the boxes:

Resource or Asset	Constraint or Liability	Not Applicable
☐	☐	☐

... then, write a short explanation of your answer (only if you think it is necessary).

There are two further steps. The first has to do with how critical your answer is to the use of the innovation. The second has to do with how you might modify the innovation either to overcome a constraint or to take advantage of a resource.

To indicate a critical answer, you should circle your check mark thus:

In terms of Resources or Assets, a judgment is critical if you think that the innovation is very positive in relation to available resources.

For example, if you feel that the innovation would receive very much support because it was very positive in relation to religion in your country, you would complete the question approximately as we have done:

	Resource or Asset	Constraint or Liability	Not Applicable
Is it in accord with religious practices?	ⓥ		

Explanation: The innovation should increase the amount of religious instruction significantly. Religions leaders are likely to give full support.

In terms of Constraints or Liabilities, a judgment is critical if you think that the innovation may face much difficulty.

For example, if you feel that the innovation might receive very much resistance (negative feeling) from parents, you would complete the question approximately as we have done:

	Resource or Asset	Constraint or Liability	Not Applicable
Would it appeal to parents?		ⓥ	

Explanation: Parents probably would object strongly because the innovation would require their children to go out of the community for too long a period.

SUMMARY:

Circle a check ☑ if you think that it is critical.

Critical either means very strong possible support because it makes use of resources or assets in your country --- or it means very strong possible rejection because it is limited by constraints or liabilities.

The final step has to do with adapting the innovation so that it will take advantage of critical resources and assets or overcome critical constraints or liabilities. It is at this time that the main purpose of the IEI can be served: adapting an innovation for use in one's own country.

Beneath each question in the IEI is a space in which you are to write your suggested adaptation. Use this space only if you feel it is necessary. And use it mostly to overcome critical constraints and liabilities.

For example:

	Resource or Asset	Constraint or Liability	Not Applicable
Would it appeal to parents?	☐	☑	☐

Explanation: Parents probably would object strongly because the innovation would require their children to go out of the community for too long a period.

Suggested adaptation: Modify schedules so that a mobile team could visit each co-munity periodically. Children could then stay in their own communities.

Remember, make suggested adaptations primarily to critical constraints and liabilities. The purpose is overcome constraints and liabilities in as much as possible.

SUMMARY ON THE USE OF THE IEI:

Step 1. For each question judge whether the innovation will (a) take advantage of resources or assets, or (b) face difficulties because of constraints or liabilities or (c) be not applicable. Make a check (√) in the appropriate column:

Resources or Assets	Constraints or Liabilities	Not Applicable
√		

Step 2. Write a short explanation (if needed) for your judgment in the space below the question:

Explanation: _____

Step 3. Circle those checks ⓥ that you consider critical.

Step 4. Write a suggested adaptation to overcome critical constraints and liabilities. You also may suggest ways to take advantage of resources and assets. However, make sure that all critical constraints and liabilities are considered.

The IEI form also provides you with space to write other questions appropriate to your own country. If you think of other questions, write them in the space provided and answer them in the same way that you answer the other questions.

Good Luck!

SERIES 5

INSTRUMENT FOR EVALUATING INNOVATIONS

—— QUESTIONNAIRE ——

INNOTECH

Adapted from Original Material
by
The Office of Educational Development
Indonesian

IEI QUESTIONNAIRE

(When filling out this Questionnaire, please refer to Directions for Use)

I. COSTS

	Resource or Asset	Constraint or Liability	Not Applicable
1. Are foreign experts required?	☐	☐	☐

Explanation: _____

_____

_____

_____

Suggested Adaptation: _____

_____

_____

_____

2. Are local experts required?	☐	☐	☐

Explanation: _____

_____

_____

_____

Suggested Adaptation: _____

_____

_____

3. Are local non-professionals required? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

4. Are more or less teachers required? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

5. Are more or less administrators required? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

6. Are more or less technicians required? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

7. Is money needed for teacher upgrading? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

8. Is money needed for administrator upgrading? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

9. Is money needed for upgrading of other personnel? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

10. Is money needed to purchase equipment ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

11. Is money needed to sent equipment? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

12. Will more or fewer buildings be required? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

13. Will new facilities be required (libraries, laboratories, electricity, etc.) ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

14. Will new teaching materials be required ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

15. Will new teachers' guides be required? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

16. Will expensive supplies be required? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

17. Is foreign purchase necessary? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

18. Is local (community) production possible? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

(Enter your own questions
on costs here)

19. Question: _____

_____

_____

_____

20. Question: _____

_____

_____

_____

21. Question: _____

_____

_____

_____

22. Question: _____

_____

_____

_____

II. TIME

1. Will time be needed to build or remodel building? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

2. Will time be needed for foreign purchases? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

3. Will time be needed for local production? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

4. Will time be needed to get approval for the project? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

5. Will time be needed for development and training ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

6. Will time be needed to recruit staff? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

7. Will time be needed to obtain foreign assistance? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

8. Will time be required to plan and coordinate activities with all agencies? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

9. Will it require time to translate from a foreign language? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

10. Will time be required for research or tryouts? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

(Enter your own questions on time here.)

11. Question: _____

_____

_____

12. Question: _____

_____

_____

13. Question: _____

_____

_____

14. Question: _____

_____

_____

III. FUNDING

1. Is money already in the budget? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

2. Can new costs be spend over several years of the budget? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

3. Is funding likely from external funding agencies? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

4. Is funding likely from the Ministry of Education? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

5. Is some of the funding likely from other Ministries? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

6. Is some of the funding likely from private or community sources? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

7. Is funding likely for future maintenance? and operation of the innovation? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

(Enter your own questions
on funding here.)

8. Question: _____

9. Question: _____

10. Question: _____

11. Question: _____

IV. POLICY AND ORGANIZATION

1. Does it agree with Ministry policy? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

2. Does it agree with other National policies? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

3. Is there likely acceptance from a number of sectors and agencies? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

4. If explained to the country, will most people be in agreement? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

5. Will it be able to change if the education system changes? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

6. Will it help to further present educational plans? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

7. Is it feasible with present facilities and abilities of staff and teachers? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

8. How complicated are procedures? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

9. What demands will it place on scheduling? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

_____

_____

10. What demands will it place on management, organization, filing, etc.? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

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_____

11. What demands will it place on maintenance? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

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12. What demands will it place on transport and communication? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

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_____

13. Will it have to be coordinated with other projects and agencies? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Explanation: _____

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14. Will it require cooperation between schools, community parents, etc.? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Explanation: _____

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15. Will it require communications among agencies and among different administrative levels? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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16. Can it be expanded to new locations? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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17. Are their any possible legal steps that must be taken? ☐ ☐ ☐

Explanation: _____

_____

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Suggested Adaptation: _____

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18. Can the concept be generalized to other uses or other institutions? ☐ ☐ ☐

Explanation: _____

_____

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Suggested Adaptation: _____

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19. Can the concept be used at other grade or education levels? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

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20. Can it be modified easily? ☐ ☐ ☐

Explanation: _____

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_____

Suggested Adaptation: _____

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21. Will it place additional demands on teacher time? ☐ ☐ ☐

Explanation: _____

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_____

Suggested Adaptation: _____

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_____

22. Will it be acceptable to teacher organization or to other professional organizations? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

23. Is speed required in printing and publishing? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

24. Is speed required in transport and communications? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

25. Is there a need for continuous evaluation? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

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_____

26. Is it adaptable to changes in staff, teachers, students, etc.? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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_____

27. Does it fit into the present system? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

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_____

(Enter your own question
on Policy and Organization here.)

28. Question: _____

29. Question: _____

30. Question: _____

31. Question: _____

V. CULTURAL AND COMMUNITY ACCEPTANCE AND SUPPORT

1. Will it work with the national language? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

2. Will it work with local languages? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

3. Will it require translation? ☐ ☐ ☐

Explanation: _____

Suggested Adaptation: _____

4. Is there a foreign language requirement? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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5. Does it agree with your country's policy on co-education (boys and girls in school together)? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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6. Will it require parents to give time? ☐ ☐ ☐

Explanation: _____

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_____

Suggested Adaptation: _____

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7. Will it require other community members to give time? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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8. Will it require a different use of school personnel time? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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9. Will adults be required to give time (say, to attend evening classes)? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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10. Will some money have to come from parents or community? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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11. Will it have an effect on student fees? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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12. Will it have an effect on religious instruction? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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13. Is it in agreement with religious practices? ☐ ☐ ☐

Explanation _____

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Suggested Adaptation: _____

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14. Will it be acceptable to all parts of the country? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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15. Will it be acceptable to both rural and urban settings? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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16. Is it likely to be acceptable to the community? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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17. Does it agree with expectations regarding education? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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18. Will it be acceptable to parents? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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19. Does it agree with national goals and philosophies? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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20. Is the idea easy to understand? ☐ ☐ ☐

Explanation: _____

_____

_____

Suggested Adaptation: _____

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_____

21. Will it help employment problems? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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22. Is it compatible with culture (respect for family, elders, etc)? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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23. Is it compatible with local social and cultural patterns? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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24. Will its participants (probably students) be proud to take part? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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25. Can it overcome possible resistance to change? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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26. Will it avoid unwanted new practices (for example, foreign culture)? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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27. Will it violate people's sens of morals (for example, modesty)? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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28. Will it give respect for the countries art and culture? ☐ ☐ ☐

Explanation: _____

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_____

Suggested Adaptation: _____

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_____

(Enter your own questions on
Cultural and Community Acceptance and Support here.)

29. Question: _____

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30. Question: _____

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31. Question: _____

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32. Question: _____

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VI. EFFECTS

1. Has it worked elsewhere? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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2. Is it similar to something that is working now? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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3. Is it in keeping with good principles of learning, teaching, management, etc.? ☐ ☐ ☐

Explanation: _____

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Suggested Adaptation: _____

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_____

4. Do you think it will help solve the problem it was designed to solve? ☐ ☐ ☐

Explanation: _____

_____

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Suggested Adaptation: _____

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_____

(Enter your own question on
Effects here.)

5. Question: _____

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6. Question: _____

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7. Question: _____

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8. Question: _____

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Summarize here the most critical aspects of the innovation for your country and your suggested adaptations.

Critical Aspects	Suggested adaptations
1.	
2.	

Critical Aspects	Suggested Adaptations
3.	

Summarize here your opinion about the use of the innovation in your country. (Assume that the adaptations you have suggested are made to the innovation.)