

THE DEVELOPMENT AND EVALUATION OF PROGRAMED
INSTRUCTIONAL MODULES IN CHILD DEVELOPMENT
FOR FILIPINO HOME ECONOMICS
COLLEGE STUDENTS

By

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CHAPTER I

INTRODUCTION

Educational technology in advanced countries has led to the development of significant innovations that may be adopted by developing nations. One of these innovations is programmed instruction (henceforth referred to as PI). PI has been defined by Deterline as a "process of interaction between a student and some form of stimulus input that is controlled by a program" (Deterline, 1967). In this form of interaction the student learns at his own pace and in the process receives reinforcement from the immediate feedback.

Strong advocates of PI such as Skinner and Deterline claim certain advantages in using it (Skinner, 1964 and Deterline, 1970). These are (1) allowing the individual to work at his own pace, (2) providing effective handling of a fair range of individual differences, and (3) giving more time for teachers to work with individual students when necessary.

The problem of large enrollment and few teachers in home economics is widespread in the Philippines. More teachers are not hired because there is a lack of funds allotted for education. Thus, in the classrooms the students are "mass-taught." Those "fit" to learn within certain periods survive and continue further schooling. Those who are slow are left behind and usually drop out. Individualized instruction is impossible.

Although PI cannot replace a teacher, at least it can provide individual instruction to the students on certain phases of the course. There are two possible ways through which this can be done. One is by providing individualized instruction in the developed material. The other is by freeing teachers from some of their lecture time thereby making possible more student conferences when necessary.

Significance of the Study

In the Philippines, the use and studies on PI in home economics are practically nil. The reports of studies about this form of instruction in this country (Philippines) were in other fields such as extension and education. PI, if utilized in the field of home economics in the Philippines, can perhaps partly solve the perennial classroom problems such as larger classes than that which is ideally desired, and meager instructional materials.

Much of the subject matter in the area of child development included as part of a home economics curriculum can be used as the content of PI. There is basic knowledge and skill in this area which could be programed. Students who are slow in learning and who lack information on certain phases of courses in child development may be helped to learn at their own pace. Students who are advanced can proceed at a much greater speed without the teacher neglecting the slower ones.

Perhaps there are students and staff in child development and other areas of home economics in the Philippines who could be encouraged to seek further learning on how programed materials are developed when they are exposed to PI. These students and staff may be able to

develop materials in certain other areas in the field, thereby enriching the home economics curriculum. It is the belief of the writer that if the individual developing the programmed instructional materials is familiar with the language and culture of the population for whom the material is designed, learning will be more meaningful. Japan sets an example on this in Southeast Asia in that their teachers develop their own materials (Numano, 1965).

There are great possibilities in the use of PI in home economics in the Philippines, particularly in the area of child development. Since there are practically no PI materials in this area for Filipino home economics students, determining whether this form of instruction will effectively work on such a specific group of students is quite a problem. Development of the programmed materials in the area of child development, which is the writer's particular interest, and actually testing them with Filipino students enrolled in child development can perhaps contribute information about the feasibility of PI in that country.

The Feasibility of the Use of Programed Instruction in Home Economics in the Philippines

The Philippine educational system is generally patterned after that of the United States. This is particularly true in the field of home economics. Here, the course offerings and their descriptions are identical to those in the United States. In the home economics curriculum the majority of the textbooks, references, visual aids and even the methods of teaching came from the United States. This is understandable since the concept of home economics as introduced into the

Philippine educational system is also based on that of the United States. Many of the leaders in this field obtained their higher (graduate) education from the United States.

The medium of instruction in the high school and college levels in the Philippines is English. Thus, the instructional practices in the United States are not entirely foreign to those used by Filipinos. PI appears feasible in teaching home economics in the Philippines. In the absence of materials applicable to the target population, PI modules should be developed by the writer who is a Filipino. Pamphlets, as a medium, should be used rather than machines for pamphlets are less expensive. If the materials are found acceptable and effective the cost of mass-producing them is less than that of obtaining machines.

Statement of the Problem

This study is primarily concerned with two aspects, namely:

(1) developing PI modules using selected basic concepts in child development and guidance, and (2) trying out the developed programmed modules with a specific sample of Filipino undergraduate home economics students representing the target population. Also included is further testing of the programmed modules with a specific high school sample who are not representative of the target population, to determine appropriateness of grade level of the materials. The study sought answers to the following questions:

1. Can selected basic concepts in child development and guidance be programmed for Filipino home economics college students?
2. Can Filipino home economics college students learn from the developed PI modules? Can these students learn equally well

from the conventional lecture and discussion method using subject matter equivalent to that of the PI modules?

3. Is PI given to Filipino home economics college students more effective than the conventional lecture and discussion method with equivalent subject matter?
4. Does the college sample show a relationship between:
 - a. Students' "modified gain scores" from the PI modules and their general ability taken from their cumulative grade point average?
 - b. Students' English language proficiency and either cumulative grade point average or modified gain scores?
 - c. Students' attitude toward PI and either cumulative grade point average or modified gain scores?
5. Do high school students learn as well from the programmed modules as the college students?

The questions indicated above, except the first one, have corresponding hypotheses.

Hypotheses

Expressed in null forms, the hypotheses of the study are as follows:

1. There is no significant difference in the mean scores of the criterion pretest and the posttest for either the college group using the developed PI modules (the experimental) and the other with lecture and discussion (the control).
2. There is no significant difference between the mean scores in criterion posttest of the college experimental and control

groups after equating initial differences regarding (a) criterion pretest scores, (b) cumulative grade point average, and (c) English language proficiency.

3. There are no significant correlations between:
 - a. Modified gain scores (henceforth termed MGS) and cumulative grade point average (hereon termed GPA) for either the experimental or the control groups.
 - b. English language proficiency scores and either GPA or MGS of the experimental and the control groups.
 - c. Attitude toward PI and either GPA or MGS of the experimental group.
4. There are no significant differences among means of MGS of the three groups of students, namely: the experimental college group and the fourth year and the first year high school groups.

Definition of Terms

The use of "technical" terms in research writings can often create a communication gap between the researcher and the reader. To minimize or eliminate this problem, technical terms often used by the writer in this study are defined below.

1. Instruction - Instruction and teaching are often used interchangeably. However, instruction as used here refers to that "special kind of teaching that has specificity of purpose and orderliness that does not characterize all teaching" (Deterline, 1967). The behavior of the learner and the conditions appropriate for such a behavior are so specified and

controlled that one can observe and predict the expected results of the instruction.

2. Programed Instruction - "A process of interaction between a student and some form of stimulus input that is controlled by a program" (Deterline, 1967). In PI materials the content is sequenced in an ordered and precise manner that induces the learner to make a response. In the process his correct responses are reinforced immediately.
3. Programed Module - Segments of a course programed for class use.
4. Linear Programing - A "single-path sequence" (Crowder, 1964) of information and question arranged in small blocks or steps where each step is reinforced along the way by knowledge of correct answers.
5. Branching Programing - A "multiple-path sequence" (Crowder, 1964) of information and questions arranged in larger blocks or steps. Each student has a choice of which path to take and the paths he takes are dependent upon his pattern of response.
6. Feedback - "Communicating to the subject pursuing a sequence of programed materials the information needed to modify response so that failures or errors can be eliminated and correct responses maintained" (Cook, 1964). Inclusion of correct answers immediately after the frame is one technique of providing feedback to the learner.
7. Reinforcement, Immediate - "The process of providing the subject with immediate feedback or information regarding the success or failure of his performance" (Cook, 1964). It has been

theorized that immediate knowledge of correct responses promotes further learning.

8. Frame - A unit of information and question (Schriven, 1969).
9. Prompts - Cues, such as underlining or providing the first letter of a significant concept, that are provided in a frame to call the attention of the learner.
10. Step Size - "The amount of increase in subject matter difficulty with each step in the program" (Cook, 1964).
11. Modified Gain Score - The ratio, expressed as per cent, obtained by dividing the difference between the posttest and pretest, by the difference between the total possible correct responses and pretest, multiplied by 100 (Deterline, 1967).
12. Criterion Test - The test developed by the writer to measure the students' achievement in the study.
13. Target Population - The group for whom the PI material is designed.

Procedure

This section discusses briefly the procedure and methods used in conducting the research study. A detailed description of the procedure and method is found in Chapters III and IV.

Essentially, there were three phases in the study. The first was the developmental phase; the second, collection of data in the study; and the third, analysis and interpretation of such data.

Development

Two PI modules were developed as part of the writer's coursework in PI in the Spring semester of 1970 at Oklahoma State University. One was the 157-frame linear type and its variations on "Child Rearing Practices and Guidance" and the other was a 79-frame modified branching type on the "Development of a Healthy Personality (Erikson's Theory)." This theory was presented by Erikson in his book Childhood and Society (1950). Also included in the developmental phase was the writing of a course outline with subject matter equivalent to that of the PI modules, and the construction of a criterion test to measure the performance of students in both the experimental and control groups.

Collection of Data

Data collection was made possible by the use of three testing measures. These were the criterion test, the Michigan Test of English Language Proficiency (henceforth termed MTELP) from the University of Michigan, and Balfour's "Scale for Measuring Attitudes of Prospective Home Economics Teachers Toward Programed Instruction" developed at Cornell University (Balfour, 1965).

Formal testing. The testing of the PI modules was completed under the supervision of the writer at the Mindanao Institute of Technology, a state college located in Kabacan, Cotabato, Philippines. The subjects were 34 home economics college students officially enrolled in Child Development and Guidance in the first semester of the school year 1970-1971. Only 17 of these students selected at random were given the developed programed modules. They served as the experimental group. The other 17 had lecture and discussion on content comparable to that

found in the programmed materials. This group was the control. A faculty member in the Department of Home Economics in the college who was officially assigned to teach the course, taught the control group. The teacher followed closely the course outline and visual aids prepared by the writer.

To determine appropriateness of the PI modules to the grade level of the target population, the materials were tested further with 29 fourth year and 28 first year high school students.

Analysis of Data

Data analyses consisted of (1) validating the developed criterion test, (2) testing for the effectiveness of the PI modules, (3) comparing PI with conventional lecture and discussion method, and (4) further testing to determine appropriateness of the materials to the grade level for which they were designed. Statistical measures used were Pearson's Product Moment Correlation, Spearman-Brown "Prophecy Formula," t-tests (correlated, pooled and not pooled), and single classification analyses of variance and covariance.

Scope and Limitations of the Study

This study was not only concerned with developing programmed material in child development and guidance but also with finding out if college home economics students in the Philippines could learn from PI. In order that these two main tasks could be accomplished within the specified period of the study, the development of the programmed material in basic child development and guidance was limited to only two concepts rather than the programing of the whole course. These

concepts were:

1. Child rearing practices and guidance.
2. Personality development (Erikson's Theory).

A second limitation of the study was the selection of subjects for pretesting of the programed modules. Recruiting subjects for the pretesting of the developed program at Oklahoma State University, i.e., those having comparable characteristics with the target population, was impossible. There were only four Filipino graduate students at the university, each with major fields other than home economics, and only one was available for the pretesting. There was no Filipino student at the undergraduate level. Therefore, instead of using Filipino students in home economics for the pretesting of the developed program, three international graduate students (each with a different major field) and one Filipino housewife, were used. The limiting factor here could be that the reaction of these students toward the programed material may be different from that of Filipino home economics college students in child development and guidance.

A third limiting factor was related to the selection of the subjects for the formal testing of the developed programed material in the Philippines. There were only 34 students enrolled in the class in child development and guidance. Another restriction was that all the subjects were females. Moreover, an analysis of the personal information regarding living situations of the subjects and the educational background of their parents showed that all the subjects lived in a rural area and their parents were mostly farmers who had a relatively low educational background. This prevailing characteristic background of the subjects is not true of all home economics students in the

Philippines. Results of the study, therefore, were confined to a very select and small group of subjects.

Additional limitations of the study were encountered during formal testing. Because of the unexpected extracurricular activities and recently proclaimed holidays in the Mindanao Institute of Technology where the experiment was conducted, there were modifications in the planned time gap between the posttest and the retention test. The time gap between the pretest and using the programmed material was shortened to 15 days. The time gap between the posttest and the retention test was shortened to 20 days for the control and 19 for the experimental group. The original time gap as planned between pretest and giving of the programmed material, and between posttest and retention test was 30 days.

The last and perhaps the most serious limiting factor in this study was the lack of pretesting of the developed criterion test on a group comparable to those for whom the instrument was intended. When the criterion test was ready for pretesting there were no available undergraduate Filipino home economics students at Oklahoma State University where the pretesting should have been done.

Summary

Programed instruction as a method consists of certain properties that could possibly teach basic concepts in child development for Filipino home economics college students. Assessing the effectiveness of the instruction for this group was, therefore, essential. Since programmed instructional material designed for this group of Filipino students was not available the writer decided to include as part of the

main study, the development and validation of such material. Based on the performance of the developed programmed instructional material the effectiveness of this form of instruction could be evaluated. The next chapter discussed in detail a review of literature which forms a background for this study.

CHAPTER II

REVIEW OF LITERATURE

A survey of the literature revealed significant information about PI and child development in home economics that served as a useful background for this study. Discussion of such information is organized into six main headings. The first is concerned with the types of PI. The second is about conflicting views on certain aspects of PI. The third involves the development and evaluation of PI material. The fourth is concerned with studies on PI in home economics. The fifth includes the use of PI in countries other than the United States. Finally, the sixth is a review made of the selected concepts in child development to be programmed.

Types of Programed Instruction

The beginning of the use of PI is traced back to 1927 when Sidney Pressey invented what he called the "Drum Tutor" (Pressey, 1964). This was a "teaching and testing" device which presented "multiple-choice alternative" questions. The student works on these questions, skipping those that he knows, and going back to those that he does not know, until he gains mastery of the whole lesson. Psychologists and educators were not enthusiastic about PI at this time. Later in the fifties, this form of instruction started gaining popularity through the efforts of men such as B. F. Skinner and Norman Crowder (DeCecco, 1964).

Linear Programing

B. F. Skinner, a psychologist, pioneered in the "linear" type of programing. In linear programing bits of information are introduced in small steps, then a question is presented sometimes accompanied by a direction, and knowledge of results follows (Holland, 1960). A student working on a linear type follows only one path sequence. In connection with this type of programing it was theorized that knowledge of wrong answers is harmful to the student, hence low error rate on frame is essential. To provide for low error rate on frame the material would be sequenced in a manner such that known or easy ones precede the unknown or difficult ones. In other words, sequencing should be made so that the level of difficulty is graduated.

Skinner's principle of "reinforced conditioning" (sometimes called instrumental conditioning) which was found to be effective with rats and pigeons, is the basis of linear programing (Holland, 1960). Essentially reinforced conditioning is established on the theory of "stimulus-response" (Baldwin, 1967). The theory of stimulus-response emphasizes that behavior can be "learned" and "shaped." Skinner's work with rats and pigeons revealed that through manipulation of certain stimulus and reinforcing agent, these animals behaved as they were expected to do. A concrete illustration on how reinforced conditioning works is given by Baldwin (1967) as follows: The rats were exposed to a "Skinnerian box" equipped with a lever for them to press. As they pressed the lever, pellets of food would come out automatically from the box. The lever was instrumental in obtaining food, and the food reinforced the rats by inducing them to pick the "right" lever.

The three essential elements in Skinner's reinforced conditioning principle that are applied in linear programming are (1) providing a stimulus, (2) eliciting a response from the learner, and (3) providing the learner with immediate reinforcement through knowledge of correct results. However, whether knowledge of correct results is reinforcing or not is the object of much research today. (Research studies on knowledge of results is discussed under the main heading Conflicting Views on Certain Aspects of Programed Instruction, page 19.)

According to Crowder (1964) individual differences are not considered in linear programming because the materials are sequenced in a manner that makes it possible for all students to work through them readily. Linear programming is individually paced only in the sense that one student may finish the material ahead of another. But as far as individual differences are concerned it does not provide different levels of difficulty corresponding to the general ability of individual students. Norman Crowder's criticisms leveled against linear programming is understandable because he is a supporter of another type of programming called branching.

Branching Programming

Crowder (1964) described his "scrambled book" which is an example of the branching type of programming, in this manner:

The student is given a short discussion of the material to be learned, followed by a multiple-choice question designed to test the point discussed. Each answer alternative has a page number beside it. The student chooses what he believes is the correct answer to the question and turns to the page number given for that answer. If he has chosen correctly, the page to which he thereby comes will contain the next unit of material to be learned and the next question, and so on. If he has chosen an incorrect answer, the page to

which he thereby comes will contain a discussion of why the answer chosen is incorrect, and following this again. He will not come to the next unit of new material until he has discussion, an instruction to return to the original question page to try choosing the correct answer, of course, although in choosing incorrect answers he will come upon new discussion of the old material. (page 147.)

From Crowder's description, branching type is a "multiple-path" sequence and each path brings a particular student to certain information which he probably needs. The author claims that branching type is not based on any theoretical framework. Rather, it is a technique invented to "accommodate quite a range of educational purposes." It allows for individual differences in that it provides different material for different ranges of ability. Furthermore, it helps diagnose student needs relevant to the lesson at hand. Unlike the linear, branching programing does not require all students to work through the same materials. Another type of programing discussed is "mathetics."

Mathetics Programing

Mathetics differs from both linear and branching type in that the whole concept to be programed is presented first and the other steps follow in a backward or reversed order. On the other hand, in both linear and branching programing bits of information are presented to form the whole concept. According to Gerry (1965) the major proponent of mathetics is F. Gilbert. Mathetics is a process whereby a matheticist identifies the behavior and the sequence of performance leading to the mastery of such behavior. Model exercises were constructed to attain mastery of the behavior (Gerry, 1965).

Presentation of a model exercise is clearly explained by Espich and Williams (1967) on "retrogressive chaining" which is an example of

mathematics type of programing. In retrogressive chaining the "mastery step" which is the final one, is identified and presented first in the chain of frames. No response is required in this step. The second step in the mastery follows and is usually accompanied by heavy "prompts." A response from the learner may be required here. Then the other steps follow in sequence. Throughout the sequence there is a gradual decrease of prompts and a gradual increase in required responses. At the last sequence or step the learner is given opportunity to demonstrate that he learns the whole concept or skill without the aid of prompts. It is claimed that a student can learn the whole lesson by himself if he can accomplish all the steps in the chain of frames.

A recent concept in PI is a deviation from the usual mode of presentation (such as in linear) and does not strictly adhere to a theoretical base (such as Skinner's reinforced conditioning) according to Markle (1967). This recent concept is clearly portrayed by Markle's definition of PI which is:

a reproducible sequence of instructional events designed to produce a measurable and consistent effect on the behavior of each and every acceptable student. (Markle, 1967, page 104.)

The author contends that the above definition does not restrict the inclusion of many forms of programs which otherwise could not be classified as such. It seems that this recent concept of PI still emphasizes the "quality of control" but excludes the need for overt responding and immediate reinforcement which are essential elements in Skinnerian programing. Morgan (1970) also pointed out this change in concept when he reported that in 1968 the programs were more flexible in format and were used with a variety of media.

The changing concept of PI is perhaps due to recent findings in research on some of its aspects. Some of these findings, particularly those about knowledge of results, are discussed below.

Conflicting Views on Certain Aspects of Programed Instruction

The issues discussed here concern three aspects in PI. These are (1) controlling behavior, (2) knowledge of results as an immediate reinforcement, and (3) PI as individualized.

Controlling Behavior

"Controlling behavior," which is the basis of Skinner's linear programing, is defined as a process of maintaining an activity in a given state of intensity for a given period of time (Blyth, 1964). Through the use of linear programing the expected behavior is practically learned or shaped by the manner in which the material is sequenced and presented, and in the way the learner is reinforced. An argument against controlling behavior is that the process is undemocratic. However, Blyth (1964) believed that the principle of controlling behavior can be either authoritarian or democratic. Deterline (1964) supported the same idea when he said that versatile minds which the free society aims to attain can be achieved through a highly disciplined and controlled environment. Thus controlling behavior in learning may be one way to help reach this goal.

One possible serious outcome of controlling behavior may be that it stifles the individual's creativity. Crutchfield (1966) advanced several assumptions that due to a highly structured programed material

the following outcomes could happen: First, PI (through the use of linear programing) may produce undesirable uniformity of thinking on the part of the learners. Second, it may disregard idiosyncratic ways in which an individual thinks. Third, it may instill in the mind of the learner a sense of deference to authority. Finally, through this type of PI, the learner may not tolerate ambiguity, complexity and lack of closure while progressing towards the solution of the problem. The author, therefore, recommended the use of multi-form responses rather than limiting to single responses.

One study showed a solution to better use of the linear type of PI in developing creative behaviors among the learners (Reese and Parnes, 1970). The subjects, 957 high school seniors, were divided into two groups: the "program" and the "instructor." The "program" worked on the linear booklet by themselves without the help of teachers, while the "instructor" worked with the teachers who used the linear booklet as the basis of class discussions. In this group, students participated actively in the discussion. The findings in the study showed that a higher significant increase in creative behavior occurred among students from the "instructor" group than among those in the "program."

The writer believes that there are more creative ways to use PI in classroom situations. One way was reported by Reese and Parnes (1970) and was discussed in the preceding paragraph. Another would be using a variety of format in programing that requires more flexibility and freedom in answering the questions in the frames. The second issue discussed involves knowledge of results as an immediate reinforcement.

Knowledge of Results as an Immediate Reinforcement

While Skinner claimed that knowledge of results is reinforcing, some authorities disagree. Annet (1964) argued that knowledge of results is not the only factor reinforcing successive steps in PI. The individual's capacity to store knowledge and relate previously acquired information is a basic consideration. Another is the individual's varied reactions to what is being reinforced.

Some studies proved or disproved Skinner's contention that positive reinforcement through knowledge of results can increase learning in PI. Elerian (1968), in addition to proving that knowledge of correct answers (positive reinforcement) enhances learning, also reported that negative reinforcement (the learner knowing that he is wrong in a frame) provided similar results. However, the students without reinforcement had a lower achievement level than those who had reinforcement. Melaragno (1964) reported otherwise. He said that "erroneous responses" (students knowing that they were wrong) did not reduce the level of achievement but if a student is wrong too many times, his performance could be adversely affected. Oppenheim (1968) reported another study which showed that no significant difference on learning performance level existed among three groups of students, namely: (1) the group with 100 per cent "feedback" (students given all answers in the frames), (2) the group with "self feedback" (all answers were covered with tapes that were removable), and (3) the group with no feedback (no answers were provided in the program).

With the use of machines, files or cards answers can be flashed back to the students, hence one can be sure that answers are seen. However, the degree of attention a student gives to these answers may

vary. Printed books and pamphlets are a different medium. A student is free to look at the answers or not. In a study reported by Geis, et al. (1970) only six out of 24 students checked their answers with those provided in the program.

In the studies reviewed the evidences that knowledge of results is reinforcing are conflicting. Perhaps other factors, besides knowledge of results, are reinforcing. Individual differences may be one of them. The last and third issue discussed is about PI as individualized.

Programed Instruction as Individualized

Whether individually-paced PI is better than group-paced still remains a question. Some studies showed that the former is as effective as the latter in terms of learning performance. However, such studies showed different results in terms of attitude toward PI and time of completing the material. Kress (1969) reported that the group-paced was as effective as the individually paced when the effects of social interaction of four groups of eleventh grade pupils (the individually-paced, the group-paced, and the group-paced plus public confirmation) were compared in terms of criterion scores. No significant difference existed among these groups in terms of their attitude toward PI. However, there was a significant difference among them in completing the programed material. As the degree of interaction increased, the time required to complete the programs also increased.

Heyel (1968) reported his study on the comparison between self-paced and group-paced PI using cognitive information and manipulative motor skills with a sample of eighth grade male pupils. His findings revealed no significant difference between these two groups on both

upper and lower ability levels; and that students using the group-paced "required less time to complete the learning task than the last individual to complete the instruction in the individually-paced group." Attitude toward PI was not one of the variables in his study.

Other studies showed that the group-paced is better than the individually-paced in terms of achievement and attitude of students toward the lessons. One of these studies was reported by Amaria, et al. (1969) on the comparison between two groups, one, consisting of students working individually and the other working cooperatively. The findings indicated that those students working cooperatively as a group gained more knowledge than those working individually. Moreover, students working cooperatively learned to "reconsider their egocentric points of view and accommodate to different observers and different solutions to the problems."

The majority of the studies discussed above indicated a search for better ways to use PI. Recent observations regarding the use of this form of instruction revealed that it is increasing (Rummler, 1970). Moreover, it was noted that it is now being "skillfully" used in the United States.

With the increasing use of PI Calvin (1970) felt a great need for more programs of the "highest quality." Such programs can only be produced through skillful development and careful evaluation of the effectiveness of the material.

Development and Evaluation of Programed Instructional Materials

Development

Suggestions and recommendations regarding the development of PI materials are varied. One possible explanation regarding this variation is that each programmer is faced with different problems such as the nature of the target population, the kind of information and even individual style of the programmer. Different ways of solving these problems are required. Thus standardization of procedures seems difficult. According to Green (1967) standardization of procedures in developing programed materials is possible only in broad terms.

Two major phases in the development of PI materials are given in this review. One deals with the statement of instructional objectives and the other on constructing frames. The stating of objectives is discussed first.

Programers are highly concerned with stating objectives that can be measured in terms of observable behavior of the learner. Thus the term "behavioral objectives" often appears in literature on PI. Behavioral objectives state changes in behavior of the learner that a program aims to accomplish. Precise and clear statements of objectives are essential before any programming can be done. Mager (1962) suggested three criteria to consider in stating objectives. One, an objective must identify a terminal behavior by name. Two, it should define the important conditions under which the behavior is expected to occur. Three, it should specify the "criteria acceptability performance by describing how well the learner must perform to be considered

acceptable." Popham (1970) added that the programmer should also distinguish in advance the minimal student and class level of performance.

In the book, Taxonomy of Educational Objectives, the Classification of Educational Goals Handbook I: Cognitive Domain edited by Bloom (1956) six classifications of the "cognitive domain" are presented. These are knowledge, comprehension, application, analysis, synthesis and evaluation. Such classifications are found useful in stating objectives about imparting information clearly and precisely.

Krathwhol, et al. (1964) made another classification of the "affective domain." These are: receiving, responding, valuing, organization and characterization. These classifications are useful in stating objectives particularly those dealing with changing the students' attitudes.

The last of the classifications of educational goals is called the "psychomotor domain." The categories under this domain are: perception, set, guided response, mechanism and complex overt response (Simpson, 1967). These categories are useful in stating objectives dealing with skills.

In discussing frame construction, the kind of stimulus (question or statement) and prompting in a frame are included. A programmer has to decide what stimulus to use in writing frames. Will it be a question or a statement? Or will it be both? Which one is more effective in programming? One study reported by McNeil and Keislar (1964) on the comparison of question or statement as a stimulus showed no significant difference in mean scores of the sample of elementary students. The amount of prompt or cues used in a frame is another consideration.

While prompts or cues can be used to some advantage there are studies which indicated that heavily prompted programs reduce the achievement level of the learner. One of these studies was reported by Goldbeck (1962). The experiment was conducted by the American Institute for Research on 63 subjects grouped into three, each group working on a different difficulty level of a program on the same subject matter content. The difference in level of difficulty was made possible by the use of different amounts of cues and prompts. The easy items had heavy cuing while the difficult ones had minimum cuing. The intermediate level had less cuing than the easy level but had more than the difficult level. The results showed that the group working on the easy level had significantly lower achievement scores than either the intermediate or difficult level group. As difficulty level increased and cuing decreased, the achievement scores also increased significantly.

A similar result was also reported by Anderson, et al. (1968). The subjects of the study were 108 secondary teachers divided into two groups. One group used the program of Holland and Skinner, without modifications on the cues and prompts in frames. This group was called the "standard." The other group worked on the same material, with the exception that the frames were modified by the use of heavy prompts and cues. Promptings consisted of: (1) underlining a response; (2) using appropriate article before each response; (3) using first alternative in multiple-choice frames as correct response; (4) using strong connectives; and (5) providing the first letter or two of the responses. The results showed that the group receiving the "standard" program had significantly higher mean posttest score than any of the heavily prompted groups.

There are "good" frames as well as "bad." If a programmer is aware of research findings in frame construction and makes use of those he thinks would work with his target population, perhaps the appearance of good frames will increase while the bad will decrease. If there are bad frames, there are what Deterline (1969) called WWF (World's Worst Frame). He gave the following frame as an example of the World's Worst Frame:

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: _____ :
: America was discovered by Columbus. Yes, America was dis- :
: covered by C _____ bus. :
: _____ :

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Development is only one main part in producing an effective program. The other is assessing whether the program that was developed will work satisfactorily with a sample of the target population. The next discussion is on evaluation.

Evaluation

Evaluation has always been an ongoing process in any teaching-learning situation. This is also true in PI. A distinction is made here between evaluation of PI material and that of PI following the suggestion given by Lumsdaine (1965).

In evaluating PI material Lumsdaine (1965) advanced two sources of information. These are the "internal" and the "external" characteristics of a program. He differentiates one from the other as follows:

... 'internal' characteristics refer to the features which can be revealed through inspection of the program material, including both its 'content' and such pedagogical features of constructions as length of frames, use of branching, techniques of promptings, patterns of repetition and review, kinds of responses called for and the like. (Lumsdaine, 1965, page 275.)

Whereas:

...'external' information about a program refers to features which cannot be observed merely by inspecting the program itself... Other kinds of external information could include such information as the qualifications of the author, the kind of student-response data obtained to measure the achievement produced by a program. (Lumsdaine, 1965, page 277.)

Espich and Williams (1967) mentioned things to look for when inspecting a program. These are the absence of typographical errors, continuity of flow of thought from item to item, use of appropriate example, size and types of frames and appropriate placement of illustrations, if any, in relation to the subject matter. All these things that the authors mentioned could be classified as 'internal' source. In the article "Criteria for Assessing Programed Instruction" reported by the Joint Committee on Programed Instruction and Teaching Machines (1963), one criticism leveled at using only the 'internal' source was that information thus derived would be subjective. Hence, the inclusion of the external criteria.

One of the major sources of the external criteria is data from actual testing of the PI material. This involves three phases, namely: the laboratory or developmental, the demonstration (formal testing), and the extension or utilization or field testing (Markle, 1967). The purpose of the laboratory phase is to make necessary revisions of the program based on the reactions of one or a few students who are closely observed as they actually work through the material. The demonstration phase is the validation or formal testing of the finished program with a representative group of students from the target population. The purpose of this phase is to provide data about what a program can do under a specified set of conditions. Finally, the field testing is concerned with using the program after it has been validated with

another group of students in a larger sample and comparing this form of instruction with other methods. Another means of field testing the program is to use a population different from that of the object of the program.

Evaluation of PI as a method is more difficult and elusive than evaluating the material itself (Lumsdaine, 1965). To compare PI with other methods of teaching such as the "conventional" would mean that the groups being studied in the sample should be learning equivalent subject matter not only in content but also in level of difficulty. This could mean that the two groups being treated should also have equal ability level. If the groups are not matched in ability level or other significant personality characteristics suspected to influence learning performance, an appropriate statistical measure should be used so that the groups are "equated" in terms of their initial differences (Popham, 1967).

Another prerequisite in the evaluation of PI is that the groups should be treated under controlled conditions so that students from one group cannot have access to the treatment given to another (Markle, 1967). Thus a writer is faced with the complicated task of setting the required environment for each group.

In evaluating PI some studies are now focused on the effects of personality characteristics of students on learning programed materials. The relationships of such variables as attitude toward PI which Calder (1970) thinks as still unexplored, the ability level, and sex of students to achievement are being studied (Davis, et al., 1970).

Programed Instruction in Home Economics

Since the main concern in this study was to use PI in home economics in the Philippines a review of literature was done in the use of this form of instruction in home economics. Literature regarding its use in home economics in countries other than the United States was not available. Hence, only those reports made in the United States were reviewed.

There has always been a search for innovative procedures to improve learning on cognitive, affective and psychomotor domains in the field of home economics. Studies on audiovisual materials, conceptual approach in teaching, macro-micro teaching, simulated games, literacy teaching and interaction analysis had been made in home economics with the purpose of enriching instruction in this field. Another innovative form of teaching which can possibly enrich home economics curriculum is PI. In the United States evidences of the interest in developing and using PI materials in home economics are shown in the increasing studies made along this line. Some of these studies are discussed below.

One doctoral study on the development and use of PI materials was done by Murphey (1968) at Oklahoma State University. She developed three programed modules for beginning course in foods and tested them with two groups of freshmen students. Some of her major findings were: Development of PI modules in foods is highly possible but "it requires a great deal of time and patience;" and achievement of the freshmen students who used the programed modules indicated a considerable gain when their pretest and posttest scores were compared. The author pointed out that one advantage is that the teacher who knows how to program will learn to present his lessons clearly and precisely.

Gould (1968), also from Oklahoma State University, studied PI as part of her doctoral dissertation about guidelines for development and use of selected types of audiovisual materials in home economics. She developed three "short" programs, two of which were linear and the third, branching. These programs were on foods and clothing. For use and evaluation, she gave them to homemaking teachers and asked for their comments regarding appropriateness of the material to grade level. The majority of the teachers thought the programs were appropriate for the ninth grade level, while others who were using them for the eighth and eleventh grade levels thought they were also appropriate for these grades. When students and teachers were asked to give their preference for types, 35 per cent of both teachers and students preferred the branching, while 41 per cent of the teachers and 29 per cent of the students preferred the linear.

Studies about PI in the field of home economics is not limited to development and use of programmed materials. There was also a study on developing an instrument to measure the attitude of student teachers in home economics toward PI. Balfour (1965) of Cornell University made this study as part of her M. S. thesis. She prepared a 39-item scale which was tested and validated.

The interest in PI in home economics in the United States has spread to other countries like Thailand. Kanjanasthiti (1968) used PI in basic nutrition as part of her doctoral study at Ohio State University. She made modifications on American-prepared PI material, then translated it into the Thai language and used it with 100 Thai technical college students. The supervision of the instruction was done by her brother. Some of her findings were: (1) American-prepared

programs when modified and translated into Thai language, were effective in terms of learning performance for Thai technical college students; (2) the majority of the college students in the sample studied wanted to use the program in combination with instructors.

While the above study indicated that the use of American-prepared programs in another country such as Thailand has been found effective, the writer is convinced that programs developed by a native teacher for a particular population are more meaningful and probably more effective than "borrowed" ones.

In the absence of reported literature on PI in home economics in countries other than the United States, a review on its use in general was made. This review covers England, Russia, Africa and Southeast Asia.

Programed Instruction in Countries Other than the United States

England

In England, the use of PI is quite remarkable. Basu, et al. (1967) indicated that in 1967 the growth of British-developed programs had increased 10 times since 1962. From 1960 to 1966 Great Britain had been using programs prepared in the United States. From 1966 on, Great Britain started using more of their own prepared programed materials. During this period about 62 per cent of the programs were prepared by the British and only 38 per cent were made in the United States. A total of 1218 programs were reported available in Great Britain in 1966. However, a decline in work on PI since 1966 to 1970 was reported by Unwin (1970) based on papers read at the Association of Programmed Learning known as the APL, and the Association for Programmed Learning

and Educational Technology, the APLET. He pointed out that this decline was evidenced in three ways. First, there was a decline in the number of teaching machines. Second, the absence of programed texts in certain areas or topics of learning was noticeable. Finally, the funds for the advancement of PI in Great Britain had already been exhausted.

Russia

Slight differences of opinion regarding the basis of development of PI in Russia appear in the literature. Vogt (1965) reported that Russia, who initially opposed the use of PI, later adopted it from the United States and became second only to the latter in its use. This report seems to imply that Russia's PI has the same theoretical bases as that of the United States. Contrary to the foregoing implication, Landa (1970) who is the director of the Programmed Instruction Laboratory of the Academy of Psychological Sciences in Moscow, pointed out that the basis of PI in Russia is "cybernetics." He defined cybernetics as the "science which studies the communication and the processes of control in living organisms and machines." On the other hand, the PI in the United States as previously mentioned, was established on psychological and pedagogical foundations. Such foundations, however, are not excluded in cybernetics as advanced by Landa (1970).

Africa

The progress of PI in Africa is significant to the study made by the writer for two reasons. First, Africa is a developing nation. Second, many parts of Africa were reported to have used English as a medium of instruction. Both reasons are applicable to the Philippines.

Soladaye (1965) reported that PI started in Africa in 1963. The progress of PI in that country is not encouraging (Lawless, 1969). He indicated that a survey of the universities of English-speaking Africans in 1967 revealed only isolated examples of cases using PI. According to him the "failure" of PI in Africa is attributed to two factors. One was the misconception that PI can be used only with machines. The other was the lack of skill in English or French and a poor vocabulary in these languages on the part of the African learners. Poor vocabulary, the author added, restricts the range of responses that the students can make, and restricts the effectiveness of knowledge of results as an immediate reinforcement. He also stated that the other variables affecting the effectiveness of the use of PI are (1) entering skills, and (2) reading abilities.

The foregoing comments by Lawless (1969) on the use of PI in Africa were seemingly leveled at the college level. At the secondary level, Soladaye (1965) reported that this form of instruction showed "promising results" during the early part of its introduction in the country. Even recently, a study indicated that PI is superior to the conventional in terms of learning performance of a sample of West Nigerian fourth year high school students (Roebuck, 1970). The author emphasized, however, that such significant difference existed within different types of subject matter.

Southeast Asia

In the Programed Instruction International Directory (1967) the status of PI from 65 different countries was published. Thirteen of these countries belong to Southeast Asia, and the Philippines was one

of them. The criteria in determining the status of PI in these countries were (1) number of books and articles about PI being published, (2) centers engaged in this form of instruction, (3) conferences held about it, (4) organizations which published articles and books on PI, and (5) professional organizations about this form of instruction. Based on these criteria Japan led among the countries in Southeast Asia. Those which had the least reported activities and publications about PI were Turkey, Thailand, Iran and the Philippines.

Selected Concepts in Child Development

to be Programed

A review of studies about PI in home economics revealed that the subject areas often used at the college level are nutrition, foods, clothing and teacher education. The writer did not find PI material on child development and guidance.

Upon examination of some syllabi in child development and guidance from selected state colleges and universities in the Philippines, two main topics seemed emphasized. One was child rearing practices and guidance and the other was on personality development. These were the topics used as content in the developed PI modules in this study. Hence, the review on child development stresses these two topics.

Child Rearing Practices

Authoritarian type. The authoritarian is described as a type where parents or adults regulate all activities of the child either for love of power or over-solicitousness for the child's welfare. This is what English (1961) termed as the "over-regulated bossy" home. The

emphasis here is on child obedience at the expense of developing self-initiative and self-discipline in the child.

In the authoritarian type of child guidance some parents or adults may sometimes feel that since the child is theirs they have every right to do with the child as they please. In short, things they do to their child usually disregard the child's rights and feelings. Other parents or adults are probably perfectionists. They want everything to be done right at the precise time. Here, they are concerned more with the task rather than the child's welfare. Still others are over-protective of the child. These are usually the parents who would consider their child as helpless and incapable of assuming responsibility.

Watson (1957) reported on the authoritarian type in a study showing that children are less creative, lack reliance on self and are dependent upon others. They are easily upset and are egocentric. English (1961) advanced that the authoritarian leadership produced dissatisfaction, loss of interest and fostered general disorder on the part of the group members studied.

Guthrie and Jacobs (1966) pointed out that dependency upon authority is conflicting with the Americans' ideal of life where self-reliance and assertive traits are encouraged. According to these authors, the American concept of dependency may be taken with caution when applied to dependency trait observed among Filipinos. Filipino-approved patterns of child rearing encourage "family sufficiency" and reciprocity. Family, rather than individual independence, is encouraged.

Permissive type. There seems to exist different definitions of the term permissiveness. Watson (1957) described it as parents giving in to the demands of children. On the other hand, Johnson and Medinnus (1969)

stated that if permissive means "permit, then it implies that permissive parents allow their children to engage in a certain range of behaviors and make certain decisions appropriate to their capabilities."

The writer used the concept of permissiveness as described by Watson (1957). For the purpose of showing two extremes in child rearing practices, the concept of permissiveness is taken to mean parental submission to the child's wishes and demands. It connotes laissez-faire or "let-alone" policy.

According to Duvall (1965) a longitudinal study of child rearing practices from 1940 to 1960 revealed that permissiveness in the United States reached its peak in the early 1950's. In the Lewin-Lippit-White (1939) experiment where the authors created three "social climates" (autocracy, laissez-faire and democracy), it was reported that aggression was highest in the laissez-faire or permissive group. Moreover the subjects under the laissez-faire group showed a lack of purpose which resulted in doing tasks poorly.

Developmental type. Developmental type is characterized by Duvall (1967) as one where the parents or other adults encourage the child to develop fully. At the same time, the parents enjoy taking care of him and love him for what he is. Limits and freedom are emphasized in the developmental type of child rearing in the sense that these concepts are "good" for both parents and children. Duvall (1965) indicated that some of the outcomes of the developmental type of child rearing are the development of responsibility and autonomy on the child as he grows to maturity.

Principles for Child Guidance

Waring (1966) brought out four principles for child guidance which she considered fundamental. These are:

- (1) The adult's affection for the child contributes to his feeling of security and belongingness.
- (2) The adult's respect for the child builds his feeling of self-respect and ability to achieve.
- (3) The adult's help contributes to his increased ability through learning.
- (4) The child's approval from adults encourages him to develop a set of values through his growing appreciation of his own achievement.

Adult's affection. The feeling that someone cares gives the child a feeling of security. Johnson and Medinnus (1969) considered the warm relationship between parent and child as the most significant aspect in the home. A list of evidences of adult's acceptance and rejection of the child is provided by the same authors. Showing affection, loving the child, getting interested in the child's activities, accepting him as an individual are some of the evidences of acceptance. On the other hand, showing no interest in the child, no time for the child and physical punishment or cruelty are some of the evidences of rejection.

Adult's respect. Adults showing the child that the former expect him to succeed bring in the child the desire to do his best to succeed (Waring, 1966). However, for adults whose interest is on the accomplished task, such expectation is often construed as a domineering act. There are certain cases where adults are interested in the child's welfare but the way the child perceives their behavior is different from that which the adult means to imply. One important aspect, therefore, would be to make the child understand that he, as an individual, is more important than the task itself. Some of the ways parents or adults can show respect for the child were listed by Waring as follows: ignoring

questionable or undesirable behavior of the child; giving him freedom to choose certain tasks and including him in planning a task. An outcome of respecting the child as an individual is making him feel adequate, respect himself, and possibly like himself.

Adult's help. There are cases when the child needs much help and other times when he needs little help. Parents or adults should be aware of these situations so that they can decide what appropriate help could be given to the child. Waring classified adult's help to children into direct and indirect (Waring, 1966). Helping the child do a difficult task is one example of direct help. Providing the child with a playpen in the basement during winter so that he does not go out and play in the cold is an example of indirect help. Duvall's (1967) suggestion of providing opportunities for children to do things within their abilities is an example of indirectly helping the child feel success.

Adult's approval. Approval can be specific or qualifying (Waring, 1966). Specific approval should be given immediately after a given behavior is exhibited by the child. For instance if the child has brushed his teeth without being reminded, approving the behavior should be made immediately. This could be identical with Skinner's principle of immediate reinforcement. Qualifying approval on the other hand is not necessarily given after a desired behavior is exhibited for the first time but when the child has repeated the behavior several times. In other words, such behavior is already commonly done by him.

Guiding the child using the above principles could be done directly or indirectly. Direct guidance is doing something for the child while indirect guidance is doing something to the environment which influences the child (Waring, 1966). Blackham's (1968) touch control where an

adult touches or pats a child showing aggressive behavior, could be an example of direct guidance. Holding the child who is about to cross the street during heavy traffic or stopping a child from hitting another by holding and talking with him are other examples of direct guidance.

Blackham's (1968) restructuring technique wherein the adult would change topics or activities that are too exciting for the child who is showing aggressive behavior is an example of indirect guidance. Preparing the playroom for the child, arranging toys, and putting those that adults want him to play with for some purpose at a conspicuous place are also examples of indirect guidance.

Personality Development--Erikson's Theory

One much talked-about theory on the development of an individual's personality is that of Erikson. He developed a theory of human personality development which he called "The Eight Ages of Man" (Erikson, 1950). Erikson describes the growth and the crises of the human person as a series of alternative basic attitudes. Man proceeds through eight of these stages from birth through old age. Each stage has a positive and negative aspect to which man will be exposed. In order that he will develop a healthy personality he will have to gain the positive aspects against the risks of the negative counterparts for each stage. Erikson emphasized that under favorable conditions the positive will likely out-balance the negative and man will develop a healthy personality. Erikson's eight stages in the life cycle of man and the crucial alternative attitudes for each stage are as follows:

- (1) Infancy: Trust vs. mistrust.
- (2) Early childhood: Autonomy vs. shame and doubt.
- (3) Play age: Initiative vs. guilt.

- (4) School age: Industry vs. inferiority.
- (5) Adolescence: Identity vs. identity diffusion.
- (6) Young adulthood: Intimacy vs. isolation.
- (7) Adulthood: Generativity vs. self-absorption.
- (8) Senescence: Integrity vs. disgust.

It may be mentioned in passing that Erikson put emphasis on the hierarchical classification of these stages. A successful attempt in achieving a positive goal in the first stage is necessary for the successful acquisition of the next goal in the next stage. He emphasized further the development of the sense of trust vs. mistrust in infancy as the foundation of developing a healthy personality. Finally, he said that these stages are universal and are not limited to a particular culture, race or creed.

Summary

The review of literature on PI was viewed with the purpose of determining the possibility of its use in home economics in the Philippines. The topics stressed were: (1) three types of programing, namely: linear, branching, and mathetics; (2) conflicting views on certain aspects of PI such as controlling behavior, knowledge of results as an immediate reinforcement, and PI as individualized; (3) practices in the development and evaluation of PI materials: statement of instructional objectives and constructing the frames were included in the developmental phase, while the laboratory, demonstration and field testing were stressed in the evaluation phase; (4) the use of PI in home economics in the United States where the majority of the study in this field has been done; (5) the use of PI in countries other than the United States such as England, Russia, Africa and Southeast Asia; and (6) the survey made on selected concepts in child development such as child

rearing practices, child guidance, and Erikson's theory on personality development. Programing these concepts is discussed in the succeeding chapter.

CHAPTER III

DEVELOPMENT OF INSTRUCTIONAL MATERIALS

This chapter deals with the discussion of the first phase in the procedure--the development of some instructional materials used by the writer in the study. Three materials were developed and the procedure for each is discussed in the following main sections. First, is the development of PI modules using selected concepts in child development and guidance for Filipino home economics college students. Second, is the development of the course outline using equivalent subject matter contained in the developed PI modules. The third and final main section is the construction of the criterion test to measure the learning performance of the subjects in the study.

Development of PI Modules

One major concern of the study was the development of PI modules using selected concepts in child development and guidance for Filipino undergraduate students in home economics. Two PI modules were developed by the writer as part of her course work in Programed Instruction at Oklahoma State University in the Spring of 1970. One was a 157-frame linear type dealing with patterns of child rearing practices and principles for child guidance. The other was a 79-frame branching type using Erikson's theory concerning the development of a healthy personality.

Steps in the Development of PI Modules

Selection of content. A major consideration in the selection of content for PI modules is the population for which the material is designed. This is called the "target population" (Green, 1967). The target population of the study consisted of undergraduate home economics students in the Philippines who were enrolled in a basic course in child development and guidance. The content of the PI modules, therefore, was considered a part of the educational needs of the target population. Since the development of the modules was done in the United States, a study of the needs of the target population could not be made. Instead, the writer requested that the syllabi in child development and guidance from four state colleges and universities in the Philippines be sent to her. Only two of the institutions sent their syllabi. The Department of Family Living and Child Development in the College of Home Economics at the University of the Philippines sent a syllabus entitled "Child Care and Guidance." The Department of Home Economics at the Mindanao Institute of Technology sent a syllabus, "Sociology of Child Development." It may be mentioned that a difference in the course description of the two syllabi existed. However, these two syllabi were both used in the teaching of a basic course in child development in the home economics curriculum.

Inspection of the syllabi revealed that stress was placed on personality development and child guidance. Because the writer believes that these two concepts are basic to an understanding of child development they were used as the main areas of content for the PI modules. Around these main areas, specific concepts were selected not only because they are basic but also because they could help introduce the

students to a higher-level course in the area of Family Relations and Child Development in home economics. After selecting the concepts the next step was breaking them down into subconcepts.

Task analysis. Hampton (1962) listed task analysis as one of the fundamentals in the development of PI material. He defines task analysis as that phase in the development of PI modules that contains the information about what a person does, how he does the job, and the skills necessary to do it. In task analysis of subject matter, the activity is mainly mental. The only skill involved is writing--if the learner is asked to write the answers. Thus, breaking the subject matter into units and subunits is considered by the writer as analysis of such task. Four main units with their subunits are presented below in an outline form.

Unit I. Child Rearing Practices and Guidance.

- A. Patterns of child rearing practices and two possible outcomes of each pattern as they affect the child.
 1. Authoritarian - Parents regulate all activities of the child either for love of power or over-solicitousness for the child's welfare. Two possible outcomes of the authoritarian child rearing practices are:
 - a. Children become dependent upon authority and therefore lack initiative, self-reliance and creativity.
 - b. Children relate poorly to the peer group because they tend to be easily upset and egocentric.
 2. Permissive - Parents let the child have his own way. They do not control him. They employ a "let-alone"

policy. Two possible outcomes of the permissive child rearing practices are:

- a. Children are aggressive and unruly.
- b. Children show lack of purpose or direction to accomplish certain tasks.

3. Developmental - Parents grant freedom to their children and yet set limits for them either by direct or indirect guidance. Two possible outcomes of the developmental child rearing practices are:

- a. Children develop a sense of responsibility.
- b. Children develop autonomy through maturity.

B. Waring's four principles of child guidance.

- 1. The adult's affection for the child contributes to his feeling of security and belongingness.
- 2. The adult's respect for the child builds up his feeling of self-respect and ability to achieve.
- 3. The adult's help contributes to the child's increased ability through learning.
- 4. The adult's approval encourages the child to develop a set of values through his growing appreciation of his own achievement.

Unit II. Personality Development.

Erikson's theory of the development of a healthy personality--the eight stages with their corresponding desirable attitudes and special crises.

- 1. Infancy - Trust vs. mistrust.
- 2. Early childhood - Autonomy vs. shame and doubt.

3. Play age - Initiative vs. guilt.
4. School age - Industry vs. inferiority.
5. Adolescence - Identity vs. identity diffusion.
6. Young adulthood - Intimacy vs. isolation.
7. Adulthood - Generativity vs. self-absorption.
8. Senescence - Ego integrity vs. disgust.

Unit III. Filipino Culture and Family.

- A. Family is more patriarchal in form.
- B. Family rather than individual independence is desired.
- C. Child rearing practices lean more toward authoritarian.

Unit IV. Synthesis of Units I, II, and III.

Units III and IV are interwoven in Units I and II. Thus the programmed Module I contains only child rearing practices and guidance and programmed Module II, personality development (Erikson's theory). Only Erikson's theory on personality development was programmed because of the limited time involved during the study. References used for PI Modules I and II are listed in Appendix A, page 139.

Statement of behavioral objectives. Since PI is concerned with behavior that can be observed and measured, the objectives in the programmed modules were stated in behavioral terms. Four categories in the cognitive domain (Taxonomy of Educational Objectives, 1956), namely: facts, comprehension, application, and synthesis were used. Classification of the cognitive domain helps in stating clearly the kind of performance which is expected to be exhibited by the learner as proof that he has reached the objective. Mager (1962) considered such an element a very important characteristic of "useful" objectives. Since Bloom's categories are according to a hierarchical order the degree of learning was

specified in the statement of objectives for the programmed modules.

Behavioral Objectives: PI Module I - Child Rearing Practices and Guidance. After the student has completed PI module I he should be able to:

- A. Increase his understanding of three patterns of child rearing practices by demonstrating that he can:
 - 1. List three patterns of child rearing practices.
 - 2. Give one characteristic of each pattern.
 - 3. Explain how freedom and limits in child rearing practices can be used without one opposing the other.
 - 4. Differentiate direct from indirect guidance in relation to setting limits.
 - 5. Give concrete examples for each, using Filipino parent-child interaction.
- B. Recognize two possible outcomes of each pattern of child rearing practices in the development of the child.
- C. Develop generalizations regarding the possible outcomes of child rearing practices on children in the Philippines.
- D. Recognize four key principles in child guidance as given by Waring.
- E. Apply each of the four principles in different situations in Filipino families.

Behavioral Objectives: PI Module II - Personality Development (Erikson's Theory). After the student has completed PI module II he would be able to:

- A. Identify at least the first five stages of Erikson's theory on the development of a healthy personality of man, with their

corresponding desirable attitudes and special crises.

B. Explain in his own words the desirable attitudes and special crises.

C. Apply each stage, with its desirable attitude and crisis, to the development of a child in the Filipino culture.

After constructing the behavioral objectives the sample test items were formulated to clarify the written behavioral objectives.

Constructing sample test items. A sample test item, according to Dillman and Rahmlow (1970) refers to a test question written by the objective writer to clarify an objective he has written. A test item, therefore, should "match" the objective in the sense that if the objective states that the student can diaper a baby, then a sample test question should ask that skill be exhibited by the learner. Obviously, a sample test is constructed after the statement of the objectives and before writing the program.

Sample test items were developed for PI modules I and II to clarify the behavioral objectives. The items were presented after each given module.

PI Module I - Child Rearing Practices and Guidance.

A-1. List three patterns of child rearing practices.

2. Give one distinct characteristic of each pattern. Illustrate a concrete example for each characteristic using the Filipino culture.

3. Explain how freedom and limits in child rearing practices can be used without one opposing the other. Why are freedom and limits essential in child guidance?

4. Give concrete examples for child guidance, both direct and

indirect, using parent-child interaction.

- B. Give two possible outcomes of the influence of each pattern of child rearing practices on the personality development of the child.
- C. In your own words make at least three generalizations regarding the influence of Filipino child rearing practices on the child.
- D. Waring gives four key principles for child guidance. State them and explain briefly in your own words the meaning of each.
- E. Describe four different situations of Filipino parent-child interaction where you can apply each of the four principles given by Waring.

PI Module II - Personality Development (Erikson's Theory).

- A. List at least the first five stages in human personality development as theorized by Erik Erikson.
- B. Briefly discuss when an environment can be considered favorable, producing the desirable attitude for each of the first five stages. Discuss also when an environment can be considered unfavorable, resulting in a given crisis.
- C. Apply each of the first five stages of man's life cycle, with its corresponding desirable attitude or crisis, to the development of the child under favorable or unfavorable situation in a Filipino culture.

With the behavioral objectives serving as guide, diagramming the flow of ideas was done next.

Constructing schematics (flow chart). Espich and Williams (1967) differentiated schematics from a flow chart in that the former is a diagram of the mental activities while the latter is concerned with

physical activities or events. Thus a programmer who constructs a diagram in programming skills or jobs usually uses a flow chart while one who diagrams subject matter content uses the term schematics. According to the same authors, using schematics or flow charts have certain advantages. First diagraming makes the work easier. Second, it prevents inclusion of "superfluous" material. And third, it reduces the possibility of omitting fundamental information.

A schematic representation for PI Module I - Child Rearing Practices and Guidance, was constructed (Figure 1). This diagram was the guide used in constructing frames for PI Module I. It has eight main cells with Cell No. 2 having four sub-cells. Cell No. 5 provided a summary of Cells 2, 3 and 4, while Cell No. 8 provided a summary for Cells 6 and 7. The flow direction is indicated by the arrows. Since schematics serves as a guide only, and not necessarily the exact diagram for a developed module, the writer omitted Cells 5 and 8, which are all summaries or reviews found in the actual program. Instead, she placed a review at various ends of each topic in several cells.

The schematics for PI Module II is shown in Figure 2. It has four main cells, with Cell No. 2 having 10 sub-cells. In the actual program, however, the review cell following Sub-cell d was omitted. Instead, a review Sub-cell was provided after Sub-cell f (Adolescence: Identity vs. Identity Diffusion). The writer believes that the learner should be acquainted first with the first five stages without any interruption, not even by a review, because only the first five stages are the concern in the basic course in child development. The next step was the selection of the type of instructional mode.

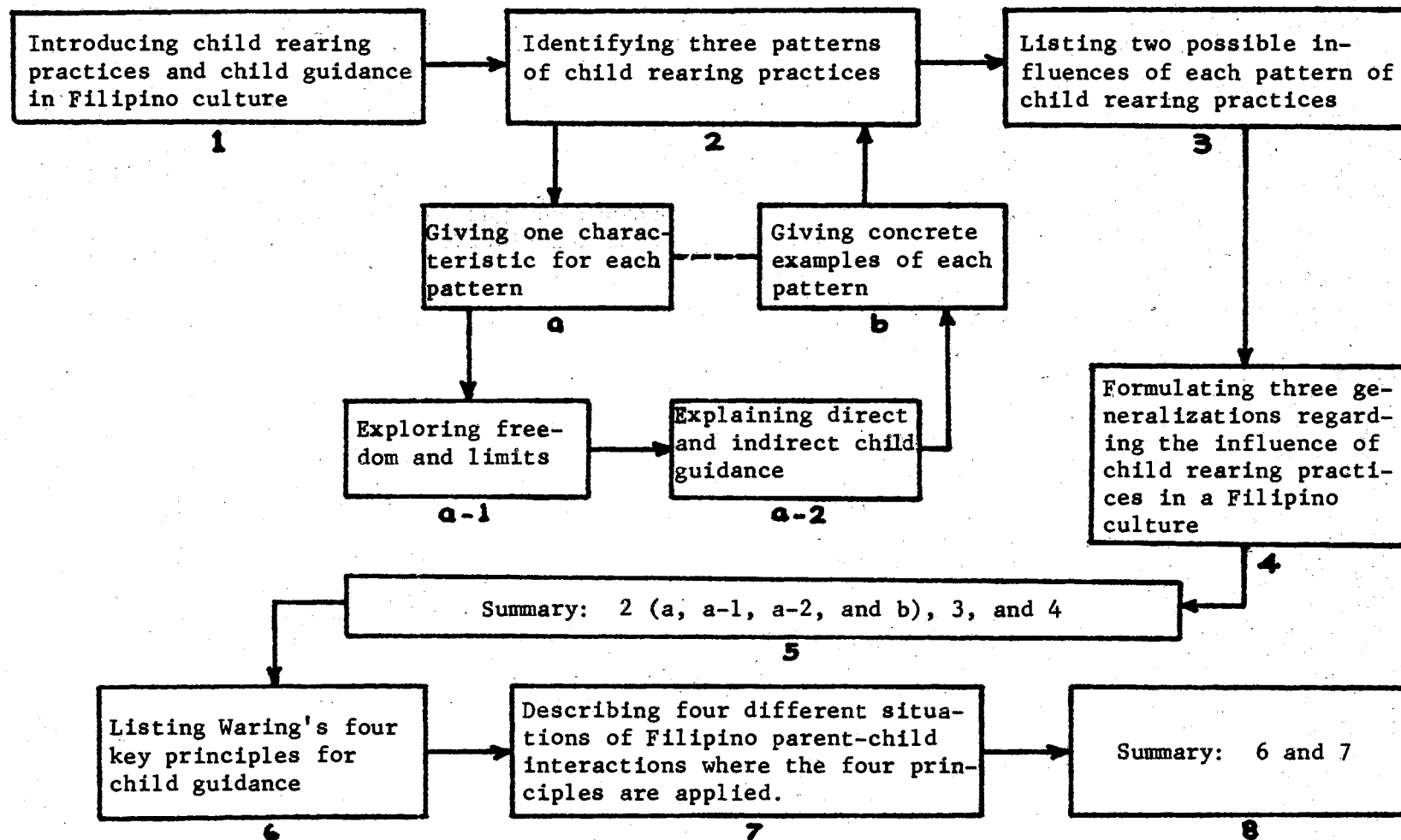


Figure 1. Schematic Diagram for Programed Module I - Child Rearing Practices and Guidance.

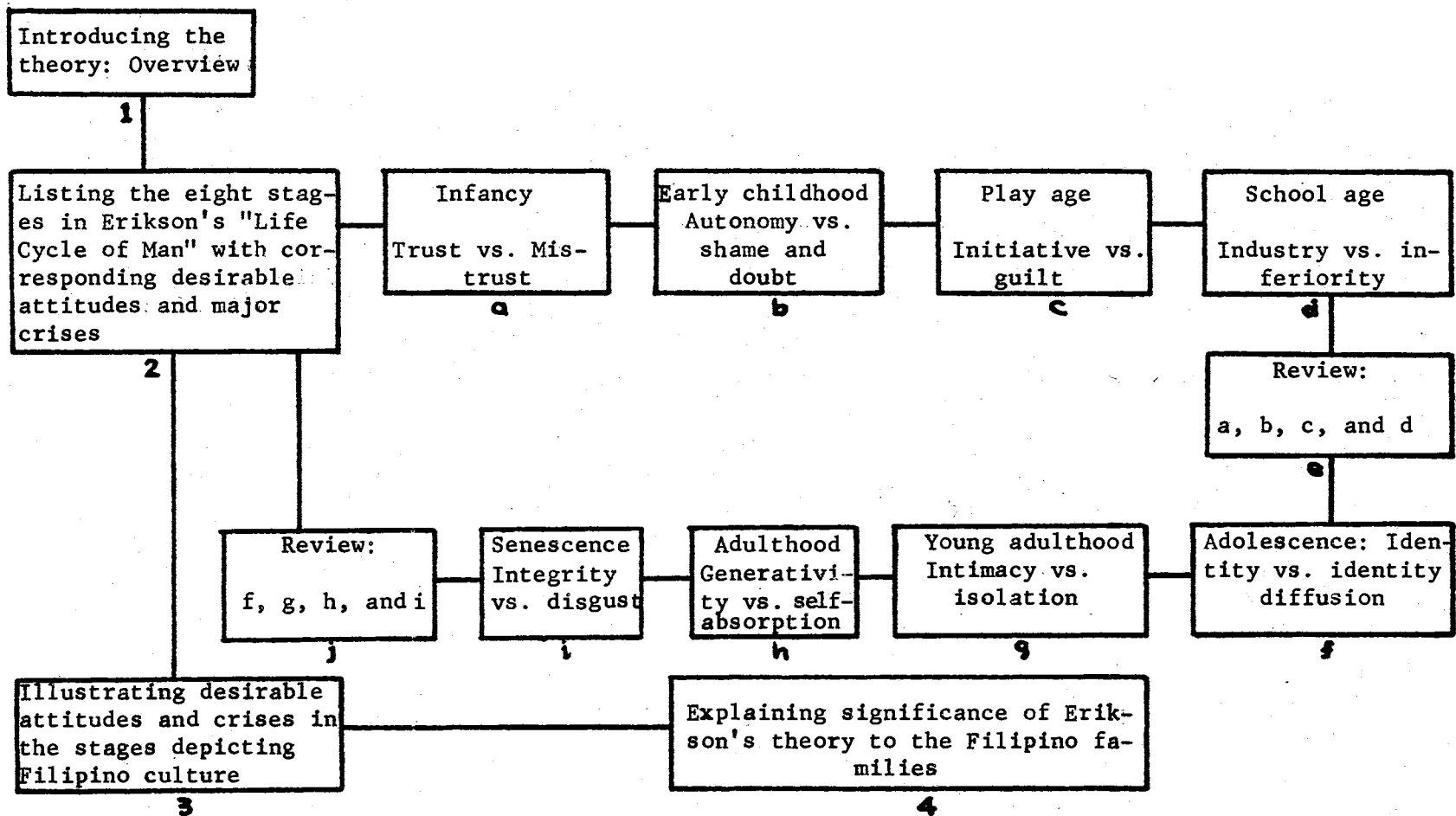


Figure 2. Schematic Diagram for Programed Module II - Personality Development (Erikson's Theory)

Selection of instructional mode. Many programmers do not restrict themselves to the use of one type of programming only. They use a variety of techniques and response models in a combination of types of programming. Lawless (1969) is one of those programmers who recommend the use of a variety of techniques and response modes. Whatever type of instructional mode selected, the decision should be made before constructing the frames.

One basic consideration made by the writer in deciding the instructional mode in programming the modules was the nature of information to be presented. Factual information, which requires recall, is better suited to the linear type (Hofer, 1967). It appears that the information that would be programmed for Module I is factual, hence the use of the linear type with its variations.

The usual format of linear programming presents the information and question first. This is called the frame. Knowledge of results is presented after the frame, and is usually placed on the same page with the frame. However, the format of linear programming varies greatly as presented above. There are linear programs today where answers are placed anywhere in the program but not on the same page where the frame is. In discussing frame construction, other variations are taken into account. The main distinguishing characteristic of the linear type, however, is that all students follow the same path as they read the material. Examples of the applications of linear programming in PI Module I are given in Figure 3. More examples on linear type of programming developed by the writer are found in Appendix B.1, page 144.

Erikson's theory on the development of a healthy personality of man seems to lean more toward the branching type. The nature of

22	
19	<p>How a child <u>relates</u> to his family members and friends is primarily influenced by child rearing practices he receives from home.</p> <p>Therefore, observing how the child relates with his family and friends is one way of studying the influence of child rearing practices. (True/False) _____</p>
	True
20	<p>A 10-year old girl demands much attention from her mother. Demanding much attention from her mother is how the child <u>relates</u> with her mother.</p> <p>A five-year old boy demands that he be followed by his peer group. Demanding to be followed by his peer group is how he r_____ with his peer group.</p>
	relates
23	<p>Aggressive behavior is exhibited in many ways. One way is by being a bully to one's playmates. Below are behaviors. Mark (v) those that are <u>aggressive behaviors</u> and mark (x) those that are <u>not</u>.</p> <p>_____ a. A child quarreling with his playmates.</p> <p>_____ b. A child hitting his friends.</p> <p>_____ c. A child sharing his toys with his friends.</p> <p>_____ d. A child demanding that all other playmates follow him.</p> <p>_____ e. A child protecting his friends from a bully.</p>
	a. <u>v</u> b. <u>v</u> c. <u>x</u> d. <u>v</u> e. <u>v</u>

Figure 3. Examples of Frames in a Linear Program from PI Module I - Child Rearing Practices and Guidance (page 12)

information provides the programmer more frame possibilities that would serve as additional learning for a student who cannot fully grasp Erikson's ideas immediately. Moreover, applying the theory established in the United States to a different culture in the Philippines may invite philosophical questions from the learner. Such questions may need further clarification and the alternative frames could serve this purpose. Thus modified branching type was used in PI Module II - Personality Development (Erikson's Theory).

PI Module II has two types of frames. The home frame is used to tell the learner he is correct, give him new information, a question, and direction. Moreover, encouraging statements are provided in each home frame. The alternative frame tells the learner that his answer is wrong. Therefore, further explanation of the problem or question is given. Then he is directed to go back to where the original question is found and make another try at picking the right answer. Examples of home and alternative frames of the modified branching type (program (PI Module II)) are found in Figures 4 to 7. These illustrations show one multiple-path sequence of the information. Not all students follow the same path. Others may find the correct answer immediately and so, they would go to a new home frame (Figure 7). Perhaps, there are some who would follow another path. And so, they may go to either of the alternative frames as shown in Figures 5 and 6. More illustrations of the modified branching type in PI Module II are in Appendix C.1, page 150. The next process discussed under the development of PI modules is frame construction.

Frame construction. One concern in frame writing is the sequencing of frames. Green (1967) pointed out that in sequencing frames,

25

:
: Your answer: Autonomy is exhibited if a two-year old
: insists in holding the ... is correct. Congratulations!
:
: Negativism is a typical behavior in early childhood.
: This is an example of the child at this stage exercising his
: autonomy.
:
: In this stage when the child exhibits negative behavior,
: a favorable environment provided by parents would be:
:
: (a) Complete permissive atmosphere to help the child
: develop further autonomy.
:
: (b) Complete authoritarian to curtail the child's nega-
: tive behaviors.
:
: (c) "Enough" freedom to encourage the child to exercise
: his autonomous self and necessary limits given in
: reassuring but firm way.
:
: If your answer is (a), turn to page 22.
: If your answer is (b), turn to page 24.
: If your answer is (c), turn to page 23.
:

Figure 4. An Example of a Home Frame in a Modified Branching Program from PI Module II - Personality Development (Erikson's Theory, page 25)

22

: Your answer: Complete permissive atmosphere ... is :
: wrong. :
: :
: Without limits or authority, the child may think he can :
: do anything he wants and therefore, do them regardless of :
: whatever will be the consequences. Autonomy is desirable :
: only when it is exercised within the acceptable norms of so- :
: ciety. :
: :
: Turn to page 25 and choose another answer. :
:

Figure 5. An Example of an Alternative Frame in a Modified Branching Program from PI Module II - Personality Development (Erikson's Theory, page 22)

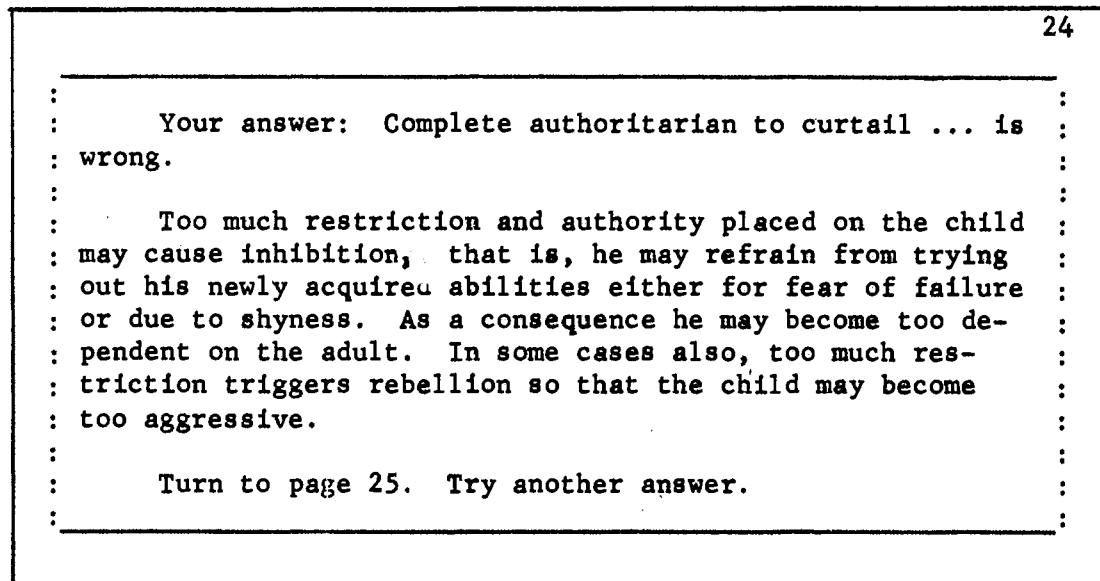


Figure 6. A Second Example of an Alternative Frame in a Modified Branching Program from PI Module II - Personality Development (Erikson's Theory, page 24)

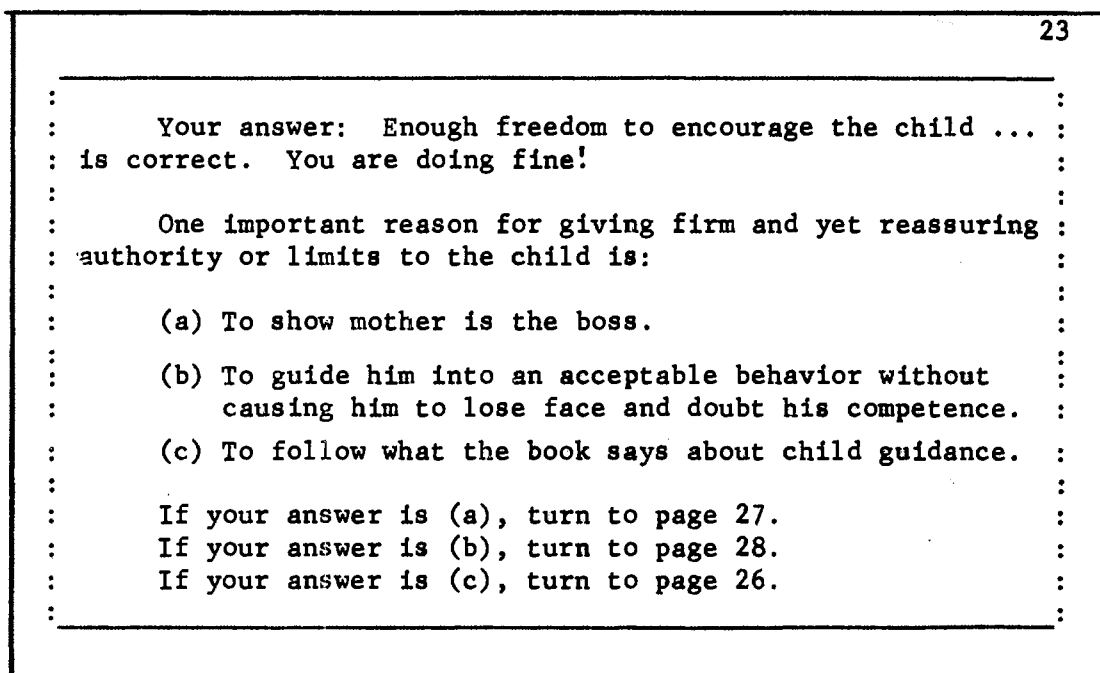


Figure 7. A Second Example of a Home Frame in a Modified Branching Program from PI Module II - Personality Development (Erikson's Theory, page 23)

two extreme directions appear. One would be following the student's manner of response, and the other would be following the absolute judgment of the instructor. However, he considers the "best" practice is to use the following steps:

1. Analyze the course into its operational behavior.
2. Develop preliminary sequences.
3. Revise the sequences based on student's results.

In developing PI Modules I and II preliminary sequencing was done following the writer's judgment. This judgment is influenced by the writer's knowledge regarding the general characteristics of the target population. Her teaching experiences with Filipino college students in child development and guidance helped much in making decisions for sequencing the materials.

Another concern in writing frames deals with the problem of presenting ideas in frames. There are techniques known as EGRUL and RULEG which authorities on PI such as Markle (1969) and Mechener (1967) have discussed fully in their writings. RULEG is short for rule (generalization) before examples (specifics) while EGRUL (or EGRULE) is example (specifics) before rule (generalization). In identifying a response rule or example, Markle (1969) suggested the use of a tilde mark (\sim). Thus, rule plus example plus an example response is represented as: RU + EG + \widetilde{EG} . With example plus rule plus rule response the representation is: EG + RU + \widetilde{RU} . There would be many possible combinations of the EGRUL and RULEG techniques in frame writing. Some of these may be RU + EG + \widetilde{RU} , RU + EG + \widetilde{EG} , or EG + \widetilde{EG} + \widetilde{EG} .

Whether the programmer presents the content as EGRUL or RULEG technique will greatly depend upon the target population rather than the

subject matter content (Mechener, 1967). If the target population finds the subject matter difficult, then EGRUL will be used. On the other hand, if the population finds the subject matter easy, RULEG may be resorted to.

RULEG and EGRULE techniques are used in some frames in PI Modules I and II. Examples of these are included in Figures 8 to 12.

	9
14 :	When Pablo and Rosa had their first-born, they were so so-
:	licitous of the child's welfare that they restricted al-
:	most all of his movements like playing outside with the
:	other children and eating some fruits. They also demanded
:	rigid schedule for his sleeping, bathing, and feeding.
:	The couple leaned more toward (authoritiarian/permissive/
:	developmental) _____ pattern of child rearing
:	practices.
:	

Figure 8. Application of EG + \widetilde{RU} in PI Module I - Child Rearing Practices and Guidance (Page 9)

The frame in Figure 8 presents an example (EG) followed by a rule or generalization response (\widetilde{RU}). Giving two contrasting examples may be considered as one EG. Two response examples, however, may be $\widetilde{EG} + \widetilde{EG}$ as shown in Figure 9 where two questions are asked for the learner to respond. In Figure 10 a generalization (RU) is presented first followed by a given example (EG), and then a question is asked to identify the type of child rearing practice (\widetilde{RU}). In Figure 11 RU is presented first and then followed by a response example (\widetilde{EG}). In Figure 12, generalization (RU) is presented first and then a response generalization (\widetilde{RU}) is asked for.

	1
:	:
2 :	Given two young children, Maria whose parents are strict :
:	and bossy, and Pablo whose parents are warm and loving. :
:	:
:	a. Who will likely become a warm and loving person? :
:	(Pablo/Maria) _____ :
:	:
:	b. Who will likely become bossy and strict? (Pablo/ :
:	Maria) _____ :
:	:

Figure 9. Application of EG + $\widetilde{\text{EG}}$ + $\widetilde{\text{EG}}$ in PI Module I -
Child Rearing Practices and Guidance (Page 1)

	16
:	:
42 :	A child reared in authoritarian homes when exposed to per- :
:	missive peer group situation where the teacher is permis- :
:	sive may make trouble with the peer group. :
:	:
:	Given: Claro, a five-year old, was found to be always :
:	getting in trouble in a permissive nursery school. He :
:	fought with other children, got their toys, and banged :
:	his desk. Claro may have been reared in (authoritarian/ :
:	developmental) _____ home. :
:	:

Figure 10. Application of RU + EG + $\widetilde{\text{RU}}$ in PI Module I -
Rearing Practices and Guidance (Page 16)

20

```

:
:   Your answer is Yes.  You are right!  Hurrah for you!
:
:   Autonomy is exhibited when:  (Selecte your answer)
:
:   (a) A two-year old follows what the mother and father
:       say all the time.
:
:   (b) A two-year old girl insists in holding the bag of
:       her mother even if the latter forbids her to so so.
:
:   If your answer is (a), turn to page 21.
:   If your answer is (b), turn to page 25.
:

```

Figure 11. Application of RU + EG in PI Module II - Personality Development (Erikson's Theory, Page 20)

51

```

:
:   Your answer is True.  You are correct!  Good work!
:
:   The fifth stage in Erikson's theory on the life cycle of
:   man is Adolescence.  This is the transition from childhood to
:   adulthood.  Adolescents are torn between what is left of
:   their childhood identity and what is expected of them in the
:   adult world.  Such a dilemma is compounded with rapid sexual
:   development at this stage.
:
:   Hence, adolescents are generally
:
:   (a) sure of their identity as to who they are, and what
:       their roles and functions are.
:
:   (b) in search for their identity, that is, they want to
:       know who they are, what their roles and functions are.
:
:   (c) not caring to know about their identities, that is,
:       who they are, what their roles and functions are.
:
:   If your answer is (a), turn to page 54.
:   If your answer is (b), turn to page 55.
:   If your answer is (c), turn to page 56.
:

```

Figure 12. Application of RU + RU in PI Module II - Personality Development (Erikson's Theory, Page 51)

The use of matrices is another technique in frame writing. According to Markle (1969) a matrix is helpful to designers who present several test items in one frame. A two-dimensional matrix was used by the writer in PI Module I in a review of the patterns of child rearing practices (Figure 13).

11

Review: Check each statement against the appropriate heading in the column at the right. For instance, statement a is checked against the column headed authoritarian.

18a		(1)	(2)	(3)	
	Child rearing practices	Authoritarian	Permissive	Developmental	
a.	Ordering the child to obey his parents and other adult members of the family <u>all</u> the time.	✓			
b.	Following the child's self-demand schedules.				
c.	Leaving the child alone to do as he pleases regardless of who gets hurt.				
d.	Setting limits as well as freedom for the child.				

Figure 13. The Use of a Matrix in a Review Frame from PI Module I - Child Rearing Practices and Guidance (Page 11)

Matching type response items could also be used in a review frame. This is shown in Figure 14. Promptings and fading are also used in writing frames. Underlining and use of first and last letters for a concept asked in a question are some of the prompts (Figure 15).

21

58 : Review: For each pattern of child rearing practices in Co- :
 : lumn A select two possible outcomes in Column B :
 : by writing only the letter. You can use one pos- :
 : sible outcome twice if necessary. :
 : : : :
 : Column A Column B :
 : : : :
 : 1. Developmental a. Child may become unruly and hostile :
 : : towards authority. :
 : : b. Child may become aggressive. :
 : 2. Authoritarian c. Child may become egocentric. :
 : : d. Child may become dependent on :
 : : authority. :
 : 3. Permissive e. Child may develop a sense of res- :
 : : sponsibility. :
 : : f. Child may develop autonomy through :
 : : maturity. :
 : : : :

Figure 14. The Use of Matching Type in a Review Frame from
PI Module I - Child Rearing Practices and Guidance.
(Page 21)

5

1 : Parents give their child freedom or limits or both.

 : a. Parents give f_____m to the child if they allow

 : him to play with toys of his choice.

 : b. Parents give l_____s to the child if they restrict

 : him not to play with certain toys.

 : c. Parents give f_____ and l_____ to the child

 : if they allow him to play with any of his toys but do

 : not allow him to play with things such as a medical

 : kit or an engineer's drawing set which they may have.

Figure 15. The Use of Prompts in a Frame in PI Module I - Child Rearing Practices and Guidance (Page 5)

		2
4	: Below are statements. Mark (v) those that are examples of	:
	: child rearing practices and mark (x) those that are not.	:
	:	:
	: <input type="checkbox"/> a. Mother feeds the child every meal time.	:
	: <input type="checkbox"/> b. Father talks to mother about the child.	:
	: <input type="checkbox"/> c. Father insists on making the child brush his teeth	:
	: before going to bed.	:
	: <input type="checkbox"/> d. Doctor looks over a sick child.	:
	: <input type="checkbox"/> e. Teacher illustrates to a seven-year old how to add	:
	: figures.	:
	:	:

Figure 16. The Use of a Discriminating Frame in PI Module
I - Child Rearing Practices and Guidance (Page 2)

Fading is simply removing prompts gradually. In PI modules underlining and use of first and last letters are removed gradually towards the end of the module.

The development of the first drafts of PI modules was completed at the end of the Spring semester of 1970. The linear PI Module I - Child Rearing Practices and Guidance, consisted of three main units. Unit I was introduction with 16 frames; Unit II, patterns of child rearing practices and guidance with 75 frames; and Unit III, Waring's four principles for child guidance consisting of 66 frames. Because there was much material in Unit III the content was divided into three parts, namely: patterns of child rearing practices where guidance was partly discussed; influences of patterns of child rearing practices; and influences of child rearing practices on the Filipino child. A total of 157 linear frames made up PI Module I.

The branching type PI Module II - Personality Development (Erikson's Theory), had 79 frames. Thirty-seven of these were the home

frames, 42 were the alternatives, and a few were unclassified frames.

Internal review of the PI modules. This phase is what Espich and Williams (1967) termed as editing. In editing the PI modules the writer examined the flow of thought from item to item as well as typographical errors, spelling, and faulty grammar. Care was taken that flow of thought was smooth and that typing and grammatical errors including wrong spelling were corrected. The main purpose of internally reviewing the PI programs was to make them free from errors which could possibly affect learning during pretesting.

Submitting PI modules to authorities for checking. The PI modules were submitted to a child development specialist to check appropriateness of content, and to a specialist in programmed instruction, to check on construction techniques. In the content some terminology and examples were improved. For instance the use of ism at the ends of developmental and authoritarian terms were removed. Also, some specific examples for qualifying approval in child guidance were clarified. For construction techniques, the flow of thought from item to item, as well as size of steps were examined. In addition, the instructions for making a response were suggested. The general appearance of the programs, including spacing between frames and content within frames were also examined and improved. Then the PI modules were duplicated for pretesting.

Pretesting the PI modules. This phase is also called the laboratory or developmental testing (Markle, 1967). The purpose of pretesting the PI material is to make necessary revisions of the product based on the reactions and comments of the subjects. The subjects, usually few in number, are observed as they actually learn. Horn (1964) indicated

that in this phase, the programmer or observer must carefully observe each student as he goes through the program, and from time to time, interview anyone who appears to experience difficulties with the frames.

From this observation, the tester learns the following information:

1. Which objectives of the training were not accomplished.
2. Which items gave students undue difficulty and why.
3. What the errors were that trainees (or subjects) made.
4. How various trainees rated the program qualitatively.

Two problems in pretesting mentioned by Markle (1967) are directly related to pretesting the PI modules. One is representativeness of subjects and the other is the observer-subject relations. A discussion of subject representativeness in relation to selection of subjects for pretesting PI modules is presented here first.

While Horn (1964) indicated that the subjects for pretesting should be representative of the target population, Markle (1967) stated that they need not be so. Questions raised about representativeness include the following: Will subject undergoing pretesting exert less effort in working on the material than the target population since the material is not part of his school work? Or will he exert more effort than the target population since he is under the direct observation of the tester? Such questions were repeatedly asked by the writer to herself when the subjects for pretesting the PI modules were selected.

Pretesting of the PI was done at Oklahoma State University. It had been mentioned under Scope and Limitations of the Study that at the time of pretesting there were no Filipino undergraduate students in home economics at the university. Therefore, three international male graduate students of agriculture, were selected. Two of them were

Thais and one was a Filipino. In addition, a Filipino housewife who finished a bachelor's degree in Commerce composed the fourth subject of the sample. The selection was based primarily on two factors. The subjects were at the higher level of education and they speak a native language which is not English. Secondary considerations were that these students and the housewife were available and they expressed willingness to help the writer identify difficult and confusing areas in the PI modules.

With regard to representativeness of the subjects selected to pretest the PI modules, some questions may be raised on two points. First, the subjects were not students in child development and in home economics. Second, they were graduate students whose ability to speak and understand English is assumed to be more advanced than those who are undergraduates and who have not had as much contact with English-speaking people or persons whose native tongue is English.

In pretesting, what seems to be significant is that the programmer is observing for the first time how the learner behaves as he is exposed to the material. The behavior exhibited by the learner can help the programmer see some faults in the program from the viewpoint of the learner. If one learner can go through the material without any obstruction, then the material is ready for formal testing. (Formal testing is discussed in Chapter IV.) Representativeness of subjects for pretesting may not be necessary in subjects for formal testing.

The observer-subject relations, as another problem in pretesting, is mainly concerned with how the programmer would react if he observes subjects who would criticize his material.

Markle (1967) characterized an ideal programmer-observer to be one who is:

...both sensitive to subtle indications of student problems and a master at solving them, at spotting gaps in the presentation, unpredicted confusions, over generalizations from previous examples, or failures to generalize. His job is to observe the student, to let the student teach him, rather than to defend his own ideas of how the student should be responding to the brilliantly designed instruction. (Page 124.)

This description of the ideal programmer is quite difficult for some to possess. However, for a programmer who wants to revise his program using information gathered during pretesting, he should welcome criticisms of his program.

In pretesting PI Modules I and II the writer used one subject at a time. PI Module I -- Child Rearing Practices and Guidance was pretested first. The subject was informed that the material was to be tested and not his general ability to answer questions. If he failed to answer a frame then something was wrong with it and not with him. The subject read page after page and the writer observed him as he read. His gestures and his vocal expressions were closely observed. Whenever his face showed a slight indication of difficulty, the writer would interview him. The same procedure was done with PI Module II -- Personality Development (Erikson's Theory).

The errors made by the subject were marked and comments listed. At this time, no changes or corrections were made on the frame where errors were committed. The modules were again given to another subject. The same procedure was followed as with the first subject.

Most of the errors of the two subjects were made because sentences in the frame were not clearly stated. Clarification of these statements were made by the writer. About 10 frames were revised, mostly on

sentence construction, to make sentences readily understood. Then the modules were given again to two subjects on different occasions. Each read the material one page at a time. The verbal reactions of the last subject pretested were tape-recorded. A portion of her comments could have been quoted in this paper, but they were in Pilipino, the national language of the Philippines. Most of her comments dealt with the substance of the programed modules in relation to what she had been reading and to her personal experiences on child rearing practices and personality development. She went through the program with only two errors. The writer did not revise the modules anymore after the fourth subject because she found out that the subject simply "misread" the words in the frames.

The next instructional material used by the writer in the study was the course outline. The course outline was used in the lecture and discussion group. The next main section describes how the course outline was developed.

Development of the Course Outline

The course outline was developed in the summer of 1970. It consisted of key concepts, subconcepts and behavioral objectives which were equivalent to the PI modules. Other items stressed in the outline were time, methods, learning experiences and evaluative procedure. The time allotted to cover the whole material was also one month or a total of 12 lessons, one hour per lesson. The teaching methods were lecture, student reports, discussion, panels, role-playing, visiting the nursery, use of visual aids (charts) and references. Equivalent learning experiences on content and evaluation procedure of PI were used in the course

outline. Other evaluation procedures were weekly tests and writing short papers after each unit. A copy of the course outline including sketches are found in Appendix D, page 160.

Steps in the Development

The first step in developing the course outline was selection of key concepts and subconcepts to be taught in the lecture and discussion method. The concepts in PI modules such as authoritarian, permissive and developmental and principles for child guidance for PI Modules I and II were used. The second step was deciding learning experiences and certain evaluation procedures equivalent to the content of the PI modules. The use of other methods besides lecture and discussion such as visiting a nursery, role-playing, and panel reports were emphasized. Also, other evaluative procedures besides pre-, post- and retention tests such as weekly tests and writing a paper were included.

The last and the most important step was the listing of references to be used by the students in the course outline. These references were the same as those used in developing the modules (Appendix A, page 139).

After the course outline had been prepared the development of the criterion test followed. This is discussed below.

Development of the Criterion Test

The Standard College Dictionary defines "criterion" as a standard by which a judgment can be made. Glaser (1963) stated that while criterion level of a course is established to refer to the "final end-of-course behavior" it can also be set at any point of the course if the instructor feels it necessary to measure proficiency level of the

learner at that given point. Thus the test designed by the writer to measure proficiency level of learning from PI modules is called the criterion test. The first step in constructing a criterion test is developing a table of specifications.

Constructing a Table of Specifications

One means of establishing a workable outline in developing a criterion test is constructing a table of specifications (Ahmann and Glock, 1967). This helps in the organization and distribution of test items, content and behavioral changes. It is one means of checking content validity of the test. In other words by examining the distribution of the subject content and behavioral changes in the table of specifications one is able to determine if the test actually measures the necessary content and behavioral changes which it intends to measure.

A two-way table of specifications was constructed by the writer (Table I). At the upper part is found the behavioral changes and at the left side is the subject matter. Behavioral changes included are facts, comprehension, application and synthesis. The subject matter content is mainly patterns of child rearing practices and guidance and Erikson's theory on personality development. Each part of the main content is divided into subtopics. The weights expressed as percentage are given for each of the subject matter content under specified behavioral changes. The decision on the number of test items constructed was based on the sample test items developed at the early part of the PI module construction.

The behavioral changes and subject matter are those indicated in the behavioral objectives in both the PI modules and the course outline.

Thus care was taken so that the development of the content and behavioral changes emphasized in the PI modules were equivalent to those emphasized in the course outline. This made possible the construction of only one test for the study.

TABLE I
TABLE OF SPECIFICATIONS FOR PI MODULES I AND II

Subject matter	Per cent of behavioral changes				Total
	A Facts	B Compre- hension	C Appli- cation	D Syn- thesis	
I. Child Rearing Practices and Guidance.					
1. Patterns of child rearing.	6	0	0	0	6
2. Characteristics of each pattern.	0	6	8	0	14
3. Possible outcomes.	6	0	0	8	14
4. Direct vs. indirect guidance.	4	2	0	0	6
5. Waring's principles for child guidance.	6	6	6	0	18
Subtotals	22	14	14	8	58
II. Personality Development (Erikson's Theory).					
1. Erikson's general theory.	4	0	2	0	6
2. Positive development.	0	2	0	0	2
3. Special crisis.	0	6	2	0	8
4. Combined positive development and special crisis.	12	14	0	0	26
Subtotals	16	22	4	0	42
Grand totals	38	36	18	8	100

The Constructed Criterion Test

The criterion test is illustrated in Appendix E, pages 177 to 183. It contains 12 items of true or false type, eight items of selection type (note that under item B-7 there are two responses required), eight items of matching type, 14 items of identification type and eight items of generalization. These items were weighted to make a 100-percent item criterion test.

Application of test item construction using the table of specifications was done in the following manner: Several objective type test items were constructed based on the sample test item developed earlier. Then the objective test items were categorized into subject matter content and type of behavioral changes. This is illustrated below.

Test I. Modified True or False. (Taken from the Criterion Test, Appendix E, page 177.)

I-3-A T F 1. Too much limits given to the child will generally stifle his sense of creativity.

II-1-A T F 12. Erikson also theorized that the development of traits at different age levels is independent of age level.

In the foregoing illustration the identification mark before the number serves as the guide in determining the distribution of test items in relation to subject matter content and behavioral changes in the table of specifications. Number 1 under Test I has an identification mark I-3-A. This identification mark is in reference to the table of specifications which reads as follows: Subject matter content I - Child Rearing Practices and Guidance, and under it is subtopic Number 3, Possible Outcomes. At the upper part which is behavioral changes, A stands for Facts. Thus, I-3-A stands for main subject matter Child Rearing Practices and Guidance, subtopic Possible Outcomes of

child rearing and the behavioral change is learning facts.

Test item Number 1, under Test I of the illustration has an identification mark of II-1-A. This means that the test item Number 12 is categorized under the main subject matter content II, Personality Development, specifically Erikson's general theory. The behavioral change tested is also learning of facts.

When the criterion test was completed it was submitted to the specialists on evaluation in Home Economics Education at Oklahoma State University, and then revised based on the suggestions of the specialists.

Summary

The development of three instructional materials was the first main procedure in the study. The first materials developed were two PI modules, one a 157-frame linear type on child rearing practices and guidance and the other, a 79-frame branching type on Erikson's theory on personality development. The PI modules were intended for home economics undergraduate students taking a course in child development and guidance in the Philippines. Hence, Filipino culture was used as the setting in providing examples of the concepts programed. Ten major steps were followed in developing these PI modules. These were (1) selection of content; (2) task analysis; (3) statement of behavioral objectives; (4) constructing sample test items; (5) constructing schematics; (6) selection of instructional mode; (7) frame construction (linear and branching); (8) internal review of the PI modules; (9) submitting the PI modules to respective specialists for content appropriateness and construction techniques; and (10) pretesting the PI

modules. The second material developed was the course outline consisting of key concepts, subconcepts, behavioral objectives, learning experiences and evaluation procedures. The methods of reaching the objectives were also stressed in the course outline. Behavioral changes and subject matter content were equivalent to the two PI modules. The third set of material developed was the 50-item response criterion test weighted to a total of 100 per cent. Construction of test items was based on a sample test and table of specifications.

The above materials were ready for evaluation in the summer of 1970. Evaluation procedure, the second main part of the writer's study, was done in the Philippines. This phase is discussed fully in Chapter IV.

CHAPTER IV

DATA COLLECTION IN THE PHILIPPINES

This chapter deals chiefly with various means employed to collect data for the developed PI modules and consequently, the PI itself. Three main sections are discussed and these are: (1) selection of samples for the experiment, (2) selection of evaluation instrument, and (3) the gathering of data.

Selection of Samples for the Experiment

The samples selected for the experiment were college students for whom the PI modules were designed and the high school students who represented a different population than that for whom the PI materials were intended.

The College Sample

Both Markle (1967) and Horn (1964) emphasized that individuals who will formally test the PI materials should, as much as possible, represent the target population. The target population for the PI modules consisted of undergraduate students enrolled in a child development class in home economics in the Philippines, who speak a native language which is not English but use English as a medium of instruction in college.

Based on the above description of the target population 34 Filipino home economics college students, who were mostly in their junior year and officially enrolled in the child development course in the Department of Home Economics in the Mindanao Institute of Technology, Philippines, were selected. Mindanao Institute of Technology is a state college offering seven bachelor degrees and a few certificate course mostly vocational in nature. The selection of the college was made because the writer was well informed about the policies and activities of the college where she taught for six years before coming to the United States to study. Such information helped in planning a workable schedule of activities in the study.

The total college sample was randomly divided into two groups by means of "lottery" to avoid bias in group selection. Seventeen students belonged to the experimental group while the other 17, to the control. The lottery consisted of listing the names on pieces of paper and placing them in a hat. In the drawing process, names which had already been drawn were rolled back and placed in the hat again to provide an equal chance for the individual student in the sample to be drawn. The size of the groups in the college sample was within the recommended range of 12 to 30 (Horn, 1964).

The college sample consisting of two groups of students is described here according to: (1) their general ability represented by the average of the total cumulative grades; (2) their background in the area of child development and related courses; (3) their place of residence; and (4) the occupation and educational background of their parents.

The cumulative average grade point for both groups was computed from their first two years in college. The cumulative grade point average for each student in the total sample ranged from 1.5 to 4.29 and the mean was 3.29.^{1/} For each independent group the cumulative grade point of each student in the experimental group ranged from 1.5 to 3.91 with a mean of 3.23, while that of the control ranged from 2.45 to 4.29 with a mean of 3.35. Thus, based on the general ability of the students expressed by means of cumulative grade point average, the experimental group was lower than the control. With respect to background in the area of child development and its related courses, four students from the experimental and six from the control group had taken six credit hours.

Most of the college students in the sample lived in rural areas. Their parents were mostly farmers hence it might be assumed that the means of support of the students came mainly from farming. The educational background of the parents of both groups in the sample, in terms of formal schooling, was quite low. The average educational attainment of the fathers of the total sample was grade six, and the mothers, grade five. For the experimental group, the average educational attainment of the fathers was grade five, and the mothers grade four. In the control group the fathers' average educational attainment was grade seven and

^{1/}In the Mindanao Institute of Technology, the grading system is by number. A grade of 1 is the highest passing mark, a grade of 5, failure. To make a uniform and easier concept for the rest of the grade points used in this study, the writer devised grade equivalents so that a grade of 1 in the study has an equivalent grade of 5 in the Mindanao Institute of Technology, and vice versa. In the writer's concept used in this study 5 is the highest passing grade while 1 is failure. Thus, 3.29 grade in this study has the original grade of 2.71.

the mothers', grade six. Based on the educational attainment of the parents, the experimental group was again lower than the control.

It should be pointed out that the selected sample for the target population had certain limitations regarding its representativeness and these should be borne in mind in interpreting and evaluating the results of this study. Students of child development and guidance in home economics in other colleges and universities could differ greatly from that of the Mindanao Institute of Technology in terms of general ability, social and economic background, and educational background of their parents.

The High School Sample

If college students could learn from the programmed material, one could not prove that a lower grade level could not learn from it as well without testing the material with a sample different from the population for whom the material is intended (Markle, 1967). One way of testing further the programmed material was to have high school students use it in the same manner as the college sample did. Thus 29 students from the last section^{2/} of the fourth year class and 28 of the first and second sections of the freshman class were chosen to compose the high school sample.

^{2/}The high school students in the Mindanao Institute of Technology are assigned to the different sections in their respective grade levels according to the grade point average in their preceding year. Thus the first section (Section 1) has the highest grade point averages while the last section has the lowest grade point averages. The first year sample in this study belonged to the upper 15 per cent while the fourth year belonged to the lower 20 per cent.

For the general ability of each high school student the writer obtained the following: The mean of the cumulative GPA for the preceding two years (fifth and sixth grades) of the first year high school students and the mean of the cumulative GPA for the preceding three years (seventh, eighth and ninth grades) of the high school seniors. The cumulative GPA of the fourth year group ranged from 72 to 84 (the highest possible grade is 100 and the lowest passing grade is 75) and the mean was 78.56. On the other hand, the cumulative GPA of the two sections in the first year sample ranged from 81 to 89 with a mean of 86.39. However, grades of the students were not considered in the actual selection of the sections in the high school groups for the experiment. Instead, the expressed willingness of the subject teacher to help in the experiment and convenience of supervision on the part of the writer were the basis on which the sections were selected.

The majority of the high school students lived in rural areas. Most of their parents were farmers. Among the fourth year students only four of the fathers were not farmers while in the first year group a number of the parents were professionals. The educational attainment of the parents of the fourth year ranged from 10th grade to none and the mean was grade six for the fathers and grade five for the mothers. In the first year the educational attainment of the parents ranged from fourth grade to Ph. D. and the mean was grade nine for the fathers and grade eight for the mothers. Educationally, the parents of the first year students were at a higher level than that of the fourth year students.

Selection of Evaluation Instruments

There were a total of five instruments used in the study. Three of these were developed by the writer. These are the two PI modules and the criterion test which have already been discussed in the preceding chapter. The other two instruments were selected mainly for evaluation purposes. These are the Michigan Test of English Language Proficiency Form A termed here as MTELP, and the "Scale for Measuring Attitudes of Prospective Home Economics Teachers Toward Programed Instruction."

MTELP Form A

MTELP Form A was used to measure language proficiency of the learner in the college sample. The instrument was selected for several reasons. First, it is designed for international students at the higher education level whose native language is not English (Manual, 1962). Second, it was recommended by personnel in the English Department at Oklahoma State University. This department is in charge of giving an English examination to foreign students seeking admission to the university and whose native language is not English. Third, it was commercially available. MTELP Form A has two reported reliability coefficients (Manual, 1962). One was 0.965 taken from 300 applicants of "unrelated language background" in 150 universities. The other was a reliability coefficient of 0.894 taken from a "homogenous and more highly proficient" sample. The predictive validity of the test has a mean correlation of 0.51 obtained from English proficiency scores and academic performance of four schools, including six programs at the University of Michigan (Manual, 1962). Form A is an objective test. It has 100-item responses: 40 in grammar, 40 in vocabulary, and 20 in

reading comprehension.

A Scale for Measuring Attitude of Prospective Home Economics
Teachers Toward Programed Instruction

The "Scale for Measuring Attitude of Prospective Home Economics Teachers Toward Programed Instruction" was developed by Jean Ann Balfour (1965) as part of her master's thesis at Cornell University. This scale was selected by the writer in her study for four reasons. First, the target population for which the instrument was designed are prospective home economics teachers. Second, upon examination of the items in the scale it was discovered that almost all of the statements could apply to Filipino students. Except for one word American which was changed to our, there was no modification made. Third, the statements were simple, clear and brief. Fourth, the scoring was not difficult to follow.

The writer wrote Dr. Helen Y. Nelson, the thesis adviser of Balfour, asking her permission to modify and use the scale (Appendix F, page 184). Permission was granted. The scale consists of 39 items of positive (favoring) or negative (not favoring) statements. There are five possible alternative responses for each statement and these are: (1) strongly agree, (2) agree, (3) undecided, (4) disagree, and (5) strongly disagree. If the statement is positively formulated, the score for strongly agree is 4, agree is 3, undecided is 0, disagree, 2, and strongly disagree 1. On the other hand, if the statement is negatively constructed, scoring is in the reverse order, making strongly disagree as 4, and strongly agree as 1 with the undecided scale still 0. The 39-item instrument has a range in item discriminating power of 0.30 to 0.70 based on a pretest of 100 subjects. It has a reliability

coefficient of 0.907.

The Gathering of Data

The formal testing was done in the Philippines. Its purpose was to validate the effectiveness of the PI modules and the developed criterion test. Also included in the validation phase was further testing of the PI modules, obtaining students' grades, and interviewing the college subjects.

Preliminary Preparations

In the summer of 1970 permission to conduct the experiment was obtained by the writer from the Officer in Charge of the Mindanao Institute of Technology. The PI modules, MTELP, and Attitude Scale were then duplicated. Because the criterion test (Appendix E, page 177) was not subjected to a pretest at Oklahoma State University while the writer was still in the United States, the draft was given to two instructors in child development in the Mindanao Institute of Technology for criticisms. They were asked to answer each item if possible. Both teachers agreed that the test was simple enough for the college juniors in the sample to be used in the formal testing. The majority of their answers matched those of the writer's. Those that did not match but were found to be correct were also included as possible correct answers.

Formal Testing of the PI Modules

On the first day of the class meeting the writer explained the experiment and its purpose to the whole college sample. Then on August 27, 1970, the day following the first class meeting, the criterion test

was given as a pretest. Only 33 students took it since one was absent from that class meeting. The student who failed to take the pretest together with the whole sample took it the following day. Before the students took the pretest, they were told by the writer that the purpose of giving it was to find out how much they already knew about certain aspects of the subject matter of child development and guidance. The students were encouraged to answer as best they could, omitting those that they did not know. They were also told that their scores from the pretest would not be used as part of their grades. In the second meeting they were given the MTELP. Then the students were assigned at random to two groups. One had 17 students and was called the experimental group and the other had also 17 students and was called the control group.

For two weeks (one hour each meeting, three days a week) the control group resumed their child development and guidance class under the teacher officially assigned to teach the class. Care was taken not to include anything about the particular subject matter of the experiment. The experimental group was supervised by the writer. During this two-week period they also resumed their child development and guidance class with subject matter which was not in the experiment. In addition, they were given orientation on PI. Exercises on how to use programmed materials (not the PI modules) were done. Then the two groups were rejoined and further instructions regarding the experiment were given. Each group was made to feel that each student was under experimentation. The purpose of this was to develop interest among the students in the experiment. Some of the students in the experimental group voiced apprehension about the use of the new method, i.e., the PI.

After two weeks of usual classwork, experimentation of the two methods, PI for experimental group and the lecture and discussion for the control group, started. The two-week gap was intentionally provided to remove, as much as possible, any effects of the pretest on learning. The writer believed that questions asked in the pretest might help facilitate learning.

The teacher of the control group followed the course outline which had been prepared by the writer (Appendix D, pages 160 to 176) to the letter. This was made possible through frequent conferences made by the writer with the subject teacher. Furthermore, tape-recording the verbal behavior of the control group helped the writer identify points which were stressed in the outline but were not taken up in class. The points missed were then taken up in the following class meeting.

The experimental group was left alone after the writer distributed the modules every class meeting. The PI module on child rearing practices and guidance was read first. The students were asked to mark the errors they made on the frame, and the time they started and stopped at each class meeting.

Class sessions for the two groups lasted for 50 minutes and there were three meetings per week. Many of the students finished PI Module I in four class meetings and immediately proceeded to PI Module II on Erikson's theory on personality development. It took the experimental group a period of six meetings (50 minutes per meeting) to finish working on the two PI modules.

At the sixth meeting, the experimental group finished reading the material in 20 minutes. The posttest, using the same criterion test given as the pretest, was administered immediately after the experimental

group finished the PI modules. The posttest lasted for one hour. There were a few who finished ahead of time and they were asked to leave the examination room. The rest continued until they finished answering all the items.

At the following meeting the experimental group was given the attitude test. They were instructed to answer every item. But in spite of the instruction, there were a few who left out some items in the attitude scale.

When the experimental group was through with the programmed modules, the control group still had their class sessions. It took the control group about 1-1/2 times as long as the experimental to finish the materials in the course outline. Ten minutes after the control finished the subject matter, the students were immediately given the posttest. This was the same criterion test they had for the pretest and the same as that given to the experimental group.

One means of determining the effectiveness of the PI was to assess how much of the acquired knowledge was retained by the students after a lapse of a given time. Thus, the retention test (the same criterion test as used for pretest and posttest) was given to the experimental group 19 days after the posttest and to the control group, 20 days after the posttest. All tests were given without being announced. The students' presence was encouraged by telling them that some make-up activities important to their classwork would be given so that their presence was badly needed.

Further Testing of the PI Modules

The high school sample consisting of 29 fourth year and 28 first year female students tested further the PI modules. Each group was treated separately. The first year had their class sessions everyday for one hour in the morning. The fourth year girls met for one hour each afternoon. Experimentation in the high school was done simultaneously with the college. The same procedure as the formal testing in college was done in the high school. The only difference was that the MTELP and the Attitude Scale were not given to the high school students. These tests were designed for college students. The high school responses may be meaningless in the sense that they might resort to guessing the answers due to failure to understand the statements. In other words, their failure to make the right response may be due to their inability to understand what was asked rather than as an evidence that they did not know the answers. There were other data needed in addition to that in the experiment, such as grades and reaction to the PI modules.

Collecting Grades and Interview

Available data such as the total grades of the college students in both the experimental and control groups were obtained from the Registrar's Office of the college, as well as information about previous Family Relations and Child Development courses. The grades of the high school students in the sample were obtained from the Principal's Office of the High School Department of the same college.

The Individual Student Record Sheet (Appendix G, page 185) was used in recording pertinent information about the subjects in the college

sample. Using an Interview Guide Sheet (Appendix H, page 186) the writer interviewed each student in the college sample regarding her reaction toward the programed modules.

Summary

Formal testing of the developed materials consisting of two PI modules and the criterion test was made with 34 college students officially enrolled in child development and guidance at the Mindanao Institute of Technology. One-half of the sample was randomly assigned as the experimental group using the programed modules. The other half was the control, using lecture and discussion. The college sample represented the target population. Further testing of the PI modules was made with 29 fourth year and 28 first year high school homemaking girls who attended the same institution. These groups did not represent the target population. Two evaluation instruments, in addition to the developed criterion test, were used in the study. These were the Michigan Test of English Language Proficiency (MTELP) and Balfour's "Scale for Measuring Attitudes of Prospective Home Economics Teachers Toward Programed Instruction" developed at Cornell University.

The steps in the formal testing with the college sample are presented in the order in which they were accomplished: (1) pretesting, (2) administering the MTELP, (3) holding class sessions (PI for experimental and lecture and discussion for the control), (4) posttesting, (5) administering the attitude scale to the experimental group, and (6) giving the retention test to the two groups. Cumulative GPA was obtained from the Registrar's Office of the college and reactions toward the developed PI modules were obtained through the writer's

interview with the college subjects. For further testing of the PI material, the same experimental procedure given to the college group using the PI modules was done with the high school sample, except for the administering of the MTELP and Attitude Scale. The grades for the high school students were obtained from the Principal's Office of the High School Department of the same institution. These grades were used to describe the general ability level of the high school sample.

Data collected from both the college and high school samples were analyzed. The analytical procedures are discussed in Chapter V.

CHAPTER V

ANALYSIS OF DATA

This chapter is concerned primarily with the analysis of the experimental results on the criterion test and PI modules. The items analyzed regarding the criterion test are validity, reliability, item difficulty level, and item discriminating power. The validation of the PI modules included data on completion time, error rate on frames and error rate on criterion test. However, the main focus in the discussion and interpretation of the effectiveness of the PI modules are the question and hypotheses set forth in Chapter I. Various statistical measures were used to test these hypotheses. Additional data which are useful for further revision of the PI modules are also discussed.

The Criterion Test

Content Validity

The criterion test was administered to the subjects to determine how well each of them achieved the behavioral objectives of the PI modules and the conventional lecture and discussion. Therefore, content validity of the criterion test should express the desired behavioral changes in relation to the subject matter included in the instruction.

The content validity of the achievement test is reflected through the table of specifications (Ahmann and Glock, 1967). The table of

specifications (Table I, page 73), which was the basis of the criterion test, indicated that the behavioral objectives and the subject matter content in the instruction were all represented by certain proportions of items in the test. Fifty-eight per cent (weighted) were on child rearing practices and guidance (PI Module I) and 42 per cent, on Erikson's theory on personality development (PI Module II). The percentage of items sampled were in proportion to the amount of material presented in each main unit.

Reliability

The "internal consistency" method, specifically the "split-half" described by Ahmann and Glock (1967) was used to assess the reliability of the criterion test. The 50 items in the test were divided equally into two. One-half consisted of the even-numbered items and the other half, the odd-numbered. The posttest scores of both halves (odd-even) of the college sample were correlated using the Pearson Product Moment Correlation Coefficient formula (Runyon and Haber, 1967). The data used in this analysis are found in Appendix I, page 191. The correlation coefficient obtained was 0.79. However, this reliability coefficient was only for one-half of the test. To obtain the coefficient for the whole test, the Spearman-Brown "Prophecy Formula" was used. The reliability coefficient for the criterion test obtained by using this formula was 0.88.

Item Analysis

Item analysis was done on the criterion test for two reasons. One was to discover the "strengths and flaws" of each item in the test. The

second was to provide data for its future revision. Two phases in the analysis were made. The first is concerned with item difficulty level.

Item difficulty level. This is the percentage of students who answered the item correctly. The formula used for solving item difficulty level as presented by Ahmann and Glock (1967) is given below:

$$P = \frac{Nr}{Nt} \times 100$$

where: P = the percentage of students who answered the test item correctly,

Nr = the number of students who answered the test item correctly, and

Nt = the total number of students who attempted to answer the test item.

The correct responses for each item in the criterion test were totaled. The sum of the correct responses for every item represent the Nr. The sample consisted of 34 students and this was Nt based on the assumption that all the students in the sample read and attempted to answer every item. Because all students in the sample were encouraged to finish answering the criterion test and no blank answers were found upon correcting the criterion test papers, the writer believed that it was safe to make the above assumption.

The item difficulty level in the criterion test (Appendix J, page 192) ranged from 15 to 100 per cent. Item 4 in Test I had 100 per cent difficulty level which is quite high, and item B-6 in Test IV had 15 per cent difficulty level which is quite low. The desired difficulty levels are between 40 and 70 per cent (Ahmann and Glock, 1967).

The ranges in item difficulty level in this criterion test were: (1) 0 to 34 per cent (low level); (2) 35 to 81 per cent (within the vicinity of 50 per cent); and (3) 81 to 100 per cent (high difficulty level). Table II shows that there were 10 items or 20 per cent of the total items, belonging to the range of 0 to 34 per cent; 28 items or 56 per cent within the range of 35 to 80; and 12 items or 24 per cent within the range of 81 to 100.

TABLE II
DISTRIBUTION OF ITEM DIFFICULTY LEVEL OF CRITERION TEST
BASED ON POSTTEST SCORES OF 34 COLLEGE STUDENTS

Difficulty level range (%)	Number of items in dif- ficulty level range	Per cent of items in difficulty level range based on 50 total items
0- 34	10	20
35- 80	28	56
81-100	12	24
Total	50	100

To conclude that the numbers within the ranges of 0 to 34 and 81 to 100 per cent difficulty levels ought to be removed from the criterion test may be premature at this point. There are subject teachers who would like to include a few items in the high difficulty level along with the easy items at the beginning of the test to motivate students to go on answering all the questions. In this connection, it was pointed out that the ability to succeed is increased and frustration reduced if a learner has experienced success at the early part of a task (Keister, 1943). Ahmann and Glock (1967) called this process as a "gentle introduction" to the remainder of the test. However,

inclusion of items of extremely low and high levels of difficulty, according to these same authors, should be viewed with "suspicion" and that further examination of such items be made according to their discriminating power. Thus item discriminating power was the second phase in item analysis of the criterion test.

Item discriminating power. An item which differentiates students who did well from those who did poorly is desired. The item discriminating power or D-value of each item in the criterion test was computed. The formula used is (Ahmann and Glock, 1967):

$$D = \frac{U - L}{N}$$

where: D = index of discriminating power,

U = number of students in upper 27 per cent of the sample who answered the test item correctly,

L = number of students in the lower 27 per cent of the sample who answered the test item correctly, and

N = number of students in each of the upper and lower groups.

The posttest scores of the college sample were arranged from the highest to the lowest. The upper 27 per cent of the total sample or 9 students, was marked as well as the lower 27 per cent which was also 9. The middle 46 per cent or 26 students were ignored. Twenty-seven per cent of the upper and lower groups is used because it is the figure often recommended by authorities on test and measurements (Ahmann and Glock, 1967). Table III shows the calculated discriminating power of the items in the criterion test, distributed according to the recommended ranges. (Detailed data of this table are in Appendix J, page 192.)

TABLE III

DISTRIBUTION OF ITEM DISCRIMINATING POWER OR D-VALUE OF THE
CRITERION TEST BASED ON POSTTEST SCORES OF THE COLLEGE
STUDENTS, AND THE RECOMMENDED D-VALUES

D-value range	Number of items in each D-value range	Per cent of items in each D-value range	Recommended* per cent of test items in each D-value range
Negative values	4	8	Should not be includ- ed
0-0.20	14	28	Less than 10 per cent
0.20-0.40	6	12	Less than 40 per cent
0.40 and above	26	52	More than 50 per cent

*From J. Stanley Ahmann and Marvin D. Glock, Evaluating Pupil's Growth, Principles of Tests and Measurements, 3rd ed. (Boston, 1961), p. 191.

There were four items or eight per cent, with a negative D-value. These items should not have been included, based on the recommended D-value because even though they tend to differentiate the upper from the lower group of students, differentiation tends to be "biased" toward the lower group. There were 14 items or 28 per cent of the total items within the range of 0 to 0.20. Only 10 per cent was recommended for this range (Ahmann and Glock, 1967). In the range of 0.20 to 0.40 there were six items or 12 per cent, and for 0.40 and above, there were 26 items or 52 per cent. The last range met satisfactorily the requirement given in Table III.

The criterion test analysis showed that few of the items in the test were weak as far as item difficulty level and discriminating power were concerned. However, the majority of the items satisfactorily met the recommended values for the two features in the item analysis. As

regards validity (the most critical factor among the three analysis) and reliability, the criterion test was satisfactory. Thus, interpretation of the findings on the effectiveness of PI through the use of PI modules were made in light of the quality and limitations of the criterion test.

The PI Modules

Programing Selected Concepts in Child Development and Guidance is Feasible for Filipino Home Economics College Students

One question asked at the beginning of the study was: Can selected concepts in child development and guidance be programed for Filipino home economics college students? The development of the two PI modules by the writer answered this query in the affirmative. Thus, programing basic concepts in the area of child development is highly feasible particularly if the programmer is familiar with the culture of the target population. As indicated in Chapter III programing procedures require much planning and patience especially for a beginner.

Developing PI material is only one main phase in programing. The other essential part is the validation of the developed program. Some data from the validation of the PI modules in this study are discussed next.

Completion Time, Error Rate on Frames and Error Rate on Criterion of the PI Modules

Although no question or hypothesis was made regarding the items in the above heading, the writer believes that these are essential information in the validation process. They are especially useful guides in the

future use of the PI modules. Furthermore, they are helpful in further refinement of the program.

Completion time. The time spent by each student in the experimental group to complete the PI modules, and the number of frames read per hour were assessed. The results of these (Appendix K.1, page 195) were the basis for computing how much time was required to read either PI Module I or II and how many frames in the PI modules were read in one hour by the subjects. Table IV indicates that PI Module I could be read in 2.98 hours with 53.82 frames per hour, and PI Module II, 1.11 hours with 76.39 frames per hour.

TABLE IV
COMPLETION TIME (HOURS) AND FRAME RATE/HOUR MADE BY 17 COLLEGE STUDENTS IN PI MODULES I AND II

Measure	Total time (hours) PI Modules		Frame rate/hour PI Modules	
	I	II	I	II
Total	50.76	18.89	915.00	1302.10
Mean	2.98	1.11	53.82	76.59

Error rate on frame. The error rate on frame is the percentage of errors made on all frames of the PI material. Such a definition is applicable only if there is just one item requiring one response in a frame. Where more than one response or no response at all is required in a frame this definition is difficult to apply. Thus in computing error rate on the frame for the PI modules, the writer counted all correct responses in the frames and used this total (rather than the total number of frames) as the basis for the computation. The step-by-step

procedure in computing the error rate on frame responses of each PI module is as follows:

- Step 1. Correct possible responses in PI Module I or II were summed.
- Step 2. All errors made by individual students per module were also totaled.
- Step 3. Individual error rate on frame responses was computed using the formula developed by the writer:

$$R = \frac{E}{A} \times 100$$

where: R = the individual error rate,

E = the total error on frame responses per module, and

A = total correct possible responses per module.

Illustration:

Student No. 1 made 21 errors on PI Module I and 5 on II.

The total possible correct responses for PI Modules I and II were 255 and 53, respectively. Therefore:

$$R = \frac{21}{255} \times 100 = 8 \text{ per cent (for PI Module I), and}$$

$$R = \frac{5}{53} \times 100 = 9 \text{ per cent (for PI Module II).}$$

- Step 4. All individual error rates on frame responses were added and then divided by the total number of students from whom the error rates were obtained.

Data on errors including error rates on frames are found in Appendix K.2, page 196. Table V shows the total errors committed by 17 students and the mean errors for each PI module. The 17 students made a total of 300 errors with a mean of 2.98 per student in PI Module I. Expressed as errors based on 255 item responses, the 17 students had a total error rate of 116 per cent with a mean of 6.82 per cent for each student. Thus, PI Module I had an error rate of 6.82. The total errors in PI Module II made by the 17 students was 62 with a mean of 3.65 per student. Therefore, based on the 53-item responses in PI Module II the total error rate made by the 17 students in this module was 115 per cent, with a mean per student of 6.76 per cent. This percentage (6.76) is the error rate for PI Module II.

TABLE V

ERRORS ON FRAME AND CRITERION POSTTEST OF 17 COLLEGE
STUDENTS USING TWO PI MODULES

Measure	Errors on frame				Errors on criterion			
	Total errors		Error rate (%)		Total errors		Error rate (%)	
	PI Module		PI Module		PI Module		PI Module	
	I	II	I	II	I	II	I	II
Total	300.00	62.00	116.00	115.00	192.00	165.00	661.00	783.00
Mean	17.65	3.65	6.82	6.76	11.29	9.70	38.88	46.06

Authorities on PI differ in their recommendations as to what percentage of error rate on frame responses is acceptable. In linear programming the error rates considered acceptable is not over 10 per cent (Horn, 1964). A 15 per cent error rate is high (Geis, 1962). In the branching type the consideration of low errors on frames is believed unnecessary. In fact students learn more from their errors.

The error rates on frame responses for both modules of this study have satisfactorily met the recommendations of PI authorities, in that each is less than 10 per cent. Whether a low error rate on frames determines that a PI material is of high quality and will effectively teach the learner, is debatable. Horn (1964) theorized that a very low error rate on frames is probably giving negative motivational effects in that the students may become bored with the material. A "low error rate on frame is a necessary but far from sufficient condition for a good constructed-answer program," said Geis (1962). Lumsdaine (1965) suggested the inclusion of error on criterion in the analysis and reporting of data when the effectiveness of the programmed material is being considered. Thus, error rate on criterion is discussed next.

Error rate on criterion. This is the percentage of errors made by a student in the achievement test based on a programmed material. Since there were two programmed materials (PI Modules I and II) used in the study error rates on criterion for each material was computed. The step-by-step procedure in computing error rate on the criterion test for both modules is presented below.

Step 1. Each item in the criterion test was classified according to the PI module from which it was taken. Then all the items belonging to PI Module I and II were totaled separately. Each total represents the total of criterion items per PI module.

Step 2. Errors on the criterion test made by each student were classified as belonging to PI Module I or II. The classified errors were then added and the sum is the total error on criterion test per PI module.

Step 3. Individual error rate on the criterion test was computed, using the following formula devised by the writer:

$$R = \frac{E}{A} \times 100$$

where: R = individual error on criterion per module,
 E = total errors on criterion test per module, and
 A = total criterion response for each PI module.

Illustration:

Total criterion items of PI Module I is 29 while that of PI Module II is 21.

Student No. 1 made 9 criterion errors in PI Module I and 5 in PI Module II. Therefore:

$$R = \frac{9}{29} \times 100 = 31 \text{ per cent (for PI Module I), and}$$

$$R = \frac{5}{21} \times 100 = 43 \text{ per cent (for PI Module II).}$$

The total errors on the criterion test and the corresponding error rate per student are found in Appendix K.2, page 196. Table V (page 100) shows that there were 192 total errors on the criterion made by 17 students in PI Module I. The mean was 11.29. For PI Module II there were 165 total errors with a mean of 9.70. The total error rate on criterion for PI Module I was 661.00 per cent with a mean of 38.88 while in PI Module II the total error rate was 783.00 per cent with a mean of 46.06. It may be interesting to point out that PI Module I had a lower criterion error rate than PI Module II. Perhaps, step and frame size are factors which caused this difference. PI Module II had larger steps and frame sizes than PI Module I.

The subject teacher usually decides the minimum level of class performance considered acceptable. The writer expected at least 75 per cent level of class performance to be acceptable. Thus, the mean error rate on criterion for each PI module ought not to be more than 25 per cent. The error rates obtained on criterion test were higher than expected.

One question posed regarding the variables of (1) time of completion per module, (2) error rate on frame responses, and (3) error rate on criterion was their relationship between each other. Is there a relationship existing between each of them?

Relationships between the variables (completion time, error rate on frame, and error rate on criterion). The Pearson Product Moment Correlation formula was used in determining the relationships of the variables above. Its coefficient is between the value of 1.00 and -1.00 (Popham, 1967). Both positive and negative correlation coefficients are perfect but they differ in their direction. In the positive perfect correlation ($r = 1.00$) one variable in the pair increases as much as the other. In the negative perfect correlation ($r = -1.00$) one variable in the pair increases at the same rate that the other decreases. A correlation coefficient of 0 shows that no relationship exists between the pair of variables. Table VI shows the correlations of each pair of the variables of the two PI modules. These correlation coefficients were obtained from the data shown in Appendix K, page 194.

The correlation coefficient between the variables total time spent in hours and error rate on frame response for PI Module I showed a negative relationship. This means that as more time was spent reading the PI Module I less errors were made on its frame and vice versa. However,

the correlation coefficient (or r-value) of -0.2538 of the same pair of variables did not reach significance at the 5% level. The r-value between time spent in reading PI Module I and criterion error rate in the same module was 0.1605. This is almost 0 correlation. In other words, there was barely a relationship existing between these two pairs of variables. The correlation coefficient between error rate on frame and error rate on criterion in PI Module I was 0.1861 which, although positive, is also near 0. All the r-values in PI Module I for the three variables did not reach significance at the 5% level. This means that there is very little, if any, probability of relationship existing between these variables.

TABLE VI

CORRELATION MATRIX OF THE VARIABLES: TOTAL TIME SPENT, ERROR RATE ON FRAME RESPONSES, AND ERROR RATE ON POSTTEST CRITERION FOR THE TWO PI MODULES

Variable	Total time (hours)	Error rate on frame responses (%)	Error rate on criterion post-test (%)
<u>PI Module I</u>			
Total time (hours)	x	-0.2580	0.1605
Error rate on frame responses (%)	x	x	0.1861
<u>PI Module II</u>			
Total time (hours)	x	0.0596	-0.3095
Error rate on frame responses (%)	x	x	0.2144

The trends in correlation coefficient for PI Module I between the three variables were also the same in PI Module II except for one item. The total time spent on the module was negatively correlated with error

rate on frame responses in Module I but the total time spent on Module II was negatively correlated with the error rate on criterion posttest although the r -value was not significant at 5% level. What these two relationships suggest is that the errors committed on the frame were independent of the errors committed on the criterion posttest.

The fact that error rate on frame responses does not have a relationship with the error rate on the criterion leads one to conclude that a low error rate on frame does not guarantee that the PI material will effectively function as expected. This finding is in agreement with Horn's contention previously mentioned that error rate on frame is an unreliable predictor of the quality of the PI material.

Since the error rate on the criterion test is quite high, the question is asked whether students in the experimental group learned from the PI modules. And if they did, will other students from the same sample learn from an equivalent subject matter taught in the conventional lecture and discussion method?

Increased Learning Through PI and Conventional Lecture and Discussion

In this study four major hypotheses were mentioned earlier. Stated in null form, the first of these is concerned with the two questions regarding increased learning from two types of instruction: There is no significant difference between the mean scores of the criterion pretest and posttest for either of the college group using the PI modules (experimental) or lecture and discussion (control) group.

The two college groups are not compared at this point. Rather, previous knowledge expressed as the criterion pretest is compared with

the criterion posttest (Appendix L.1, page 198) to determine if there was an increase in learning in both groups after the instruction period. However, if there was learning from the PI modules, could the same students also learn from the conventional method?

The t-test correlated formula was used to obtain the t-values between the pretest and posttest for both college groups and the results are shown in Table VII. This table shows that the t-values 11.7295 for the experimental and 7.2516 for the control were highly significant at 0.05% level (one-tailed). Therefore, there was a very strong evidence that increased learning took place in each group after the instruction periods. Hence, the hypothesis which stated that there was no significant difference between pretest and posttest scores in either group of college students was rejected.

TABLE VI
COMPARISON OF CRITERION PRETEST AND POSTTEST SCORES OF TWO
GROUPS OF COLLEGE STUDENTS, ONE USING PI MODULES AND
THE OTHER, LECTURE AND DISCUSSION

Criterion	Number in group	Standard deviation	Mean	t-value
<u>Experimental group (PI)</u>				
Pretest	17	8.19	26.09	11.7295**
Posttest	17	12.13	55.53	
<u>Control group (lecture and discussion)</u>				
Pretest	17	9.50	31.12	7.2516**
Posttest	17	16.54	57.44	

**Significant at 0.05% level (directional or one-tailed).

It is of interest to note that the mean difference between the posttest and pretest was larger for the experimental group (29.44) than for the control (26.32). This was also reflected in the larger t-value (11.7295) for the experimental group compared to that of the control (7.2516).

Knowing that there was increased learning in both groups does not answer the question as to which type (PI or conventional) of instruction was better. Thus, comparison between the two groups is discussed next.

Comparison Between PI and Conventional Lecture and Discussion

The second hypothesis stated that there is no significant difference between the mean scores of the criterion posttest of the college experimental and control groups after equating initial differences regarding (1) criterion pretest scores, (2) GPA, and (3) MTELP. A one-way classification analysis of covariance was used to test this hypothesis and the result is indicated in Table VIII-A.

TABLE VIII-A
ANALYSIS OF COVARIANCE OF CRITERION POSTTEST SCORES OF THE TWO
COLLEGE GROUPS (PI AND CONVENTIONAL)

Source of variation	Residuals			
	Degrees of freedom	Sum of squares	Mean square	F-value
Between	1	30.05	30.050	0.47
Within	29	1855.10	63.969	
Total	30	1885.15		

The F-value of 0.47 with 1 and 29 degrees of freedom (Table VIII-A) did not reach a significant level at 5%. Thus, the second hypothesis was accepted. The posttest scores of the experimental group did not significantly differ from those of the control and it can be concluded that in this study the PI was as effective as the lecture and discussion method, but not more so.

As indicated in Chapter IV, it was stated that the control group had a higher GPA than the experimental group. By analysis of covariance, such GPA, pretest, and MTELP scores were equated. Equating the differences of the two groups due to these three inherent variables made possible the adjustment of the means in criterion posttest scores of each group. Table VIII-B shows the adjusted mean of the experimental group to be 58.89 and that of the control, 54.53.

TABLE VIII-B

THE CONTROL VARIABLES AND THE MEAN CRITERION POSTTEST SCORES
OF THE TWO COLLEGE GROUPS (PI AND CONVENTIONAL)

Group	Criterion variable posttest mean score		Control variable mean scores		
	Adjusted	Unadjusted	Pretest	GPA	MTELP
Experimental	58.89	55.53	26.09	3.23	55.94
Control	54.53	57.44	31.12	3.35	59.82

By comparing the adjusted with the unadjusted means of each group, an increase of 3.36 in the experimental group and a decrease of 2.91 in the control group are shown to exist (Table VIII-B). These adjusted means are the values achieved by each group after removing the effects due to GPA and scores of pretest and MTELP and therefore represent the

effects due to PI and conventional method.

Johnson, et al. (1969) and Murdoch (1970) reported studies on PI which indicated favorable results. However, the "Eric Reports on Programmed Instruction" (1970) indicated that the conventional method was better than the PI. Other studies such as the one reported by Davis, et al. (1970) obtained results similar to the findings in this study, i.e., no significant difference existed between the "conventional" and PI.

Differences in research results when comparison was made between PI and a conventional procedure may be related to the material in the PI as well as the procedure in the conventional. However, whether PI is better than the conventional seems not to be a major issue in this study because it is generally accepted that no matter how effective PI is, it could not totally replace the teacher. Perhaps the fact that students learn from PI alone as well as from the conventional is sufficient to help a teacher decide whether or not to use PI as a part of the total instructional curriculum. It may be pointed out in this study, however, that since the analysis of covariance showed no significant difference between the mean posttest scores of the two college groups, the PI modules were as effective as the lecture and discussion. What this implies is that if PI is combined with any teaching procedure, it would likely help in increasing student learning.

Further comparison of the PI with the other teaching method in terms of unadjusted means, variances, and standard deviation obtained in this study showed certain interesting results. Table IX shows that the experimental group had a variance of 147.2647 with a standard deviation of 12.13. On the other hand, the control had a variance of

273.3713 and a standard deviation of 16.53. There was a greater variability in the spread of criterion posttest scores in the control than in the experimental group. In interpreting such data it should be pointed out that those students who finished the PI material ahead were not given more materials in addition to that which was in the PI modules tried. Perhaps, if the "fast" students were given more materials and these were included in the posttest, the variability of scores in the experimental group may have been greater than what it was.

TABLE IX

THE MEAN, VARIANCE, AND STANDARD DEVIATION OF CRITERION
POSTTEST SCORES OF THE EXPERIMENTAL AND CONTROL
GROUPS IN COLLEGE

Group	Mean	Variance	Standard deviation
Experimental	55.53	147.2647	12.13
Control	57.44	273.3713	16.53

The students from the experimental group did learn as well as those in the control, based on the criterion posttest scores. However, other questions may arise: Was learning influenced by other variables such as the student's GPA and ability to speak and understand the English language as measured by the MTELP scores? In the case of the experimental group, was attitude toward PI not a factor influencing learning? The next discussion deals with the interrelationships of the above variables.

Interrelationships between MGS, GPA, MTELP and attitude toward PI.
The MGS of both groups was computed as the ratio between the difference of posttest and pretest divided by the difference of total possible

scores and pretest (Deterline, 1967). The formula is:

$$\text{MGS} = \frac{\text{Posttest} - \text{pretest}}{\text{Total possible score} - \text{pretest}} \times 100.$$

Illustration:

Student No. 11 in the experimental group scored 32 in the pretest and 76 in the posttest out of 100 possible scores. Thus,

$$\text{MGS} = \frac{76 - 32}{100 - 32} \times 100 = 65 \text{ per cent.}$$

To compute GPA for each student, all her grades in the previous two years in college were multiplied by the number of credit hours, totaled and then averaged. After the MGS and GPA were obtained, the interrelationships between MGS, GPA, MTELP scores and averaged scores of attitude toward PI (for the experimental group only) were calculated, using correlation coefficient values. The data used here are in Appendix L.1, page 198. The r-values between these variables are shown in Tables X and XI.

TABLE X

CORRELATION MATRIX OF MGS, GPA AND MTELP OF 17 COLLEGE STUDENTS
USING THE CONVENTIONAL LECTURE AND DISCUSSION

Variable	MGS	GPA	MTELP
MGS	x	0.6856**	0.3929
GPA	x	x	0.7457**

**Significant at 1% level (two-tailed).

TABLE XI
CORRELATION MATRIX OF MGS, GPA, MTELP AND ATTITUDE TOWARD PI
OF 17 COLLEGE STUDENTS USING PI MODULES

Variable	MGS	GPA	MTELP	Attitude to PI
MGS	x	0.4948*	0.4436	0.0149
GPA	x	x	0.4548	0.3014
MTELP	x	x	x	-

*Significant at 5% level (two-tailed).

Hypothesis 3a states that there is no significant correlation between MGS and GPA for either the experimental or the control group. Tables X and XI show that there was a significant positive correlation between these two variables for both groups. Therefore, Hypothesis 3a is rejected. This implies that as GPA increased, the MGS also increased. In other words, those college students with higher grades learned definitely more than those with lower grades.

Hypothesis 3b states that there is no significant correlation between MTELP scores and either GPA or MGS of the experimental and control group. MTELP was positively and significantly correlated with GPA in the control group (Table X). Therefore, Hypothesis 3b concerning the relationship between these two variables is rejected for the control group. The correlation was positive but not significant between MTELP and MGS in the control group (Table X). In the experimental group the correlations between MTELP and GPA and between MTELP and MGS, though positive, were not significant. Therefore, Hypothesis 3b concerning the relationships between these variables is accepted for both groups. Evidently, the learning of both groups was not significantly influenced

by their MTELP scores.

Hypothesis 3c states that there is no significant correlation between attitude toward PI and GPA or MGS in the experimental group. Table XI shows that the correlations between these variables were not significant. Therefore, Hypothesis 3c is accepted. This means that GPA did not significantly influence the students' attitude toward PI and attitude toward PI did not significantly influence the students' learning from the PI modules.

Many of the studies on PI reviewed by the writer revealed that there was a significant and positive relationship between general ability expressed either as GPA or mental test scores, and learning from PI. Some of these studies were reported by Murphey (1968), Balfour (1965) and Evans (1963). These findings are in accord with that obtained in this study, i.e., there was a positive and significant correlation between general ability (expressed as GPA) and learning from PI among Filipino home economics college students. There were a few studies, however, which revealed that not in all cases was general ability (measured through mental tests) significantly correlated in the positive direction with posttest scores in PI. One of these was reported by Noble (1969) who indicated that out of the 40 possible correlations between intelligence (measured by the Birkbeck Series) only 18 were positively and significantly correlated with posttest scores.

Studies previously mentioned (Murphey, 1968 and Murdoch, 1970) showed no significant relationship between attitude toward PI and learning from PI. Blank and Pysh (1970) stated also that attitude toward PI is not a good predictor of learning from this form of instruction. Balfour's study (1965), however, indicated otherwise. She found that a

significant correlation existed between these two variables. She used a sample size larger than that of Murphey (1968) and much larger than the sample size in this study.

Retention in PI. Part of determining the effectiveness of PI through the use of the developed PI modules was to ascertain how much of the students' learning from the subject matter was retained two weeks after the posttest was given. At this time the retention test was administered. The effectiveness of the lecture and discussion method was also evaluated in the same manner as the experimental group. Table XII compares the retention test and posttest scores of each group in the college sample, using t-test. No significant difference existed between posttest and retention test in both groups of college students. This means that both groups retained as much knowledge as they had gained two weeks before.

TABLE XII

COMPARISONS OF THE MEAN RETENTION AND POSTTEST SCORES OF
THE TWO GROUPS OF COLLEGE SAMPLE

Criterion	Mean	Variance	Standard deviation	t-value
<u>Experimental (PI)</u>				
Posttest	55.83	147.2647	12.13	0.1374
Retention test	54.85	141.2426	11.89	
<u>Control (Conventional)</u>				
Posttest	57.44	273.3713	16.54	0.9358
Retention test	60.12	160.6103	12.68	

The t-test was also used to compare the mean retention scores of the two groups and this comparison is reported in Table XIII. This table shows that there was no significant difference between the mean retention scores of the experimental (PI) and control (conventional) groups. Thus, the amount of knowledge retained by both groups was substantially the same.

TABLE XIII

COMPARISON OF THE MEAN RETENTION SCORES OF THE TWO COLLEGE GROUPS

Group	Mean retention score	Variance	Standard deviation	t-value
Experimental	54.85	141.2426	11.89	1.2517
Control	60.12	160.6103	12.68	

Appropriateness of PI Modules for the Target Population

The fourth null hypothesis states that there are no significant differences among the mean MGS of the three groups of students, namely: the experimental college group, the fourth year high school, and the first year high school students. To compare the mean MGS of these three groups a one-way classification analysis of variance was used. The results of this analysis are shown in Table XIV. (Data of high school MGS are in Appendices L.2 and L.3, pages 199 and 200.) Table XIV shows the F-value to be 23.7981 which is highly significant. There were significant differences among the mean MGS of the three groups on PI. Therefore, the hypothesis is rejected. However, the analysis of variance does not indicate where the significant difference

between any two means lie. And so, a t-test was used to determine significant differences between any two means of the three groups. Table XV shows the results of the t-test analysis of these groups. In this table (XV) the data show that the t-value on MGS between the college experimental group and the fourth year high school group computed from a pooled variance, was 7.9622. This shows a highly significant difference between mean MGS of these two groups, showing that the mean for the college group (40.05) MGS was definitely superior to that of the fourth year high school which was 10.51.

TABLE XIV

ANALYSIS OF VARIANCE FOR MEAN MGS OF THE THIRD YEAR COLLEGE,
FOURTH YEAR HIGH SCHOOL, AND FIRST YEAR HIGH SCHOOL
STUDENTS WITH PI

Source of variation	Degrees of freedom	Sum of squares	Mean squares	F-value
Between groups	2	9540.0057	4770.0028	23.7981**
Within groups	71	14230.9679	200.4361	
Total	73	23770.9736		

**Significant at 1% level.

TABLE XV

t-TESTS FOR THE MEAN MGS AMONG THE THIRD YEAR COLLEGE,
FOURTH YEAR HIGH SCHOOL, AND FIRST YEAR HIGH SCHOOL
STUDENTS ON PI

Group comparison	t-value
Between college and fourth year high school	7.9622**
Between college and first year high school	4.4918**
Between fourth and first years high school	2.0052*

*Significant at 5% level.

**Significant at 1% level.

The t-value for the comparison between college and first year high school (also from a pooled variance) was 4.4918. This was also highly significant, indicating that the mean MGS for the college was conclusively much larger than that of the first year high school (Table XV), which was 18.13. Between the fourth and first years in high school the t-value was 2.0052 (heterogenous variance) which was significant at 5% level. This shows that the mean MGS of the first year students (18.13) was definitely larger than that of the fourth year students in high school (10.51). This unexpected performance between first and fourth year students in high school may be attributed to the differences in general ability level (first year students had a mean GPA of 86.39 and the fourth year, 78.56) between the two groups. Recalling previously discussed results that there was a significant correlation between GPA and learning from PI, it becomes apparent that the performance of the first and fourth year high school students is highly probable despite the gap between their grade levels. Schriener (1969) indicated that "many programs turn out to have a usable span of three or more grades so that the geographical differences in meaning of a particular grade are often not serious." The same author contended that if the differences in performance of different grade levels on PI are extreme, like the college and high school performance in this study for instance, the difference is found to be in favor of the grade (college level in this study) for whom the material was intended.

Other Data for Future Revision of PI Modules

The foregoing findings in this study, particularly those about errors on criterion, showed that the PI modules needed further

refinement. The data so far, do not tell which specific parts of the modules are to be revised and why they need revision. Therefore, other data were obtained through interview with each subject in the college sample using the PI modules. These are discussed below.

Frames in both PI modules where many of the students committed errors were identified according to the range of errors. Those frames are presented in Appendices B.2 and C.2, pages 146 and 155. When the students were asked why they made errors on such frames their reasons were varied and these are given in direct quotes:

That frame is confusing.
That frame uses difficult words.
I do not know why I made a mistake.
I need a direct explanation regarding the idea in that frame.
I guess I am just careless.

Surprisingly, the students also criticised the frames that they had answered correctly (See Appendices B.3 and C.3, pages 148 and 157) and their criticisms were similar to the ones given above.

The foregoing comments gave clues to the writer on revising the PI modules. Furthermore, close scrutiny of the frames missed by the students would also enable the writer to improve them.

Other data obtained from the interview are concerned with how the students liked or disliked each PI module. The findings are presented in Table XVI. In spite of their criticisms on frames 17 students indicated they liked PI Module I and 14 students, PI Module II. Three of the 17 students failed to answer the question whether they liked or disliked PI Module II.

When asked to indicate how they would like to use a linear type of program similar to PI Module I or a branching type of program similar to PI Module II in classroom situations, the students gave several ideas.

TABLE XVI

NUMBER OF COLLEGE STUDENTS ON PI WHO LIKED OR
DISLIKED PI MODULE I OR II

Module I				Module II			
Liked		Disliked		Liked		Disliked	
No.	%	No.	%	No.	%	No.	%
17	100	0	0	14*	82*	0	0

*Three of the 17 students failed to give a response.

These were grouped by the writer into two categories and reported in Table XVII. Six of the 17 students wanted to use a linear type of program as a supplement only, i.e., the materials will be used in addition to the main lessons, and not as the main source of instruction. Eleven signified they would like to use it as a main source of instruction, provided the teacher would lecture on the materials programed.

TABLE XVII

STUDENTS IN THE COLLEGE EXPERIMENTAL GROUP WHO INDICATED
HOW TO USE THE PI MODULES IN CLASSROOM SITUATIONS

Indicated use	Linear (I)		Branching (II)	
	No.	%	No.	%
As a main source in classroom instruction.	11	65	8	57
a. Students use it alone with no teacher's lecture revolving around the programed material.	0		5	
b. Students use it with teacher's lecture revolving around the programed material.	11		3	
Subtotal	11		8	
As a supplement.	6	35	6	43
Total	17	100	14	

In the case of the branching type, five of the 14 students said they would like to use it as a main source of instruction. Three students needed a teacher to help in explaining further the materials programed. Six students, however, indicated that they would like to use it as a supplement only.

Summary

Item analysis of the criterion test in this study showed that the majority of the items were not too difficult nor too easy, based on posttest scores of 34 third year Filipino home economics college students. The criterion test generally discriminated the upper 27 per cent of the students (who did well in the test) and the lower 27 per cent of the students (who did poorly in the rest). However, there were a few items that were classified as weak which needed further revision. The validity of the test as reflected in the table of specifications was satisfactory and also with reliability which had a coefficient of 0.88. Considering the quality and limitations of the criterion test, the effectiveness of the PI modules was evaluated. The average completion time for PI Module I was 2.98 hours while PI Module II, 1.11 hours. No significant relationship existed between (1) error rate on frames and time of completion, of PI modules, (2) error rate on criterion and time of completion, and (3) error rate on frames and error rate on criterion. A negative relationship existed, though not significantly, between time of completion and error rate on frame. This indicated that there was a tendency for the students to commit less errors when they spent more time reading the frames, and vice versa.

When learning (measured by the criterion test) was assessed, there was a significant increase in scores from pretest to posttest. However, when the experimental and control groups in the college sample were compared, after equating their initial differences due to pretest, GPA and MTELP, no significant difference existed between MGS of the two groups. It was also found that there was a significant relationship between MGS and GPA in both college groups. There was also a significant correlation between MGS and MTELP in the control group (using conventional lecture and discussion). No significant relationships existed between MGS and attitude toward PI and between MGS and MTELP in the group using the PI materials (experimental).

The PI modules, when tested further with the fourth and first year high school students, showed that these groups' achievement was significantly lower than the college groups for whom these PI materials were originally intended. An interesting finding about the further testing of the PI modules was that the first year girls who were in the first section (upper 15 per cent of the freshman class) obtained a significantly higher MGS than the fourth year girls classified as belonging to the lower 15 per cent of the senior class. The large difference in scores between these two high school grade levels could be attributed to the large difference in their general ability level in favor of the first year students. Grade level did not pose a handicap in learning the PI modules in the high school sample. Since the mean MGS of the high school was only about one-fourth that of the college students, it was concluded that the PI modules were suited for the third year college home economics students enrolled in child development and guidance class in the Philippines (the target population).

Other data obtained through interview were found useful as regards future refinements of the PI modules used. Some data were also useful as guidelines for teachers in the future use of PI. A summary, conclusions, recommendations and implications of the whole study is discussed in the last chapter.

CHAPTER VI

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS

Summary

This study was essentially aimed at developing PI modules using selected concepts for a course in child development and guidance and evaluating these modules with a sample of Filipino college home economics students enrolled in child development and guidance. In the evaluation of the programmed modules, PI as a method of teaching was consequently assessed. Questions and their corresponding hypotheses were formulated regarding the effectiveness of the developed PI modules. One question concerning the developmental phase was: Can selected basic concepts in child development and guidance be programmed for Filipino home economics college students? The other questions had their corresponding hypotheses and therefore, only the latter are presented here. Expressed in null form the hypotheses are:

1. There is no significant difference in the mean scores of the criterion pretest and posttest for either of the college groups: the experimental (using the developed PI modules) and the control (with lecture and discussion).
2. There is no significant difference between the mean scores in criterion posttest of the college experimental and control groups after equating initial differences regarding

(a) criterion pretest scores, (b) grade point average (GPA), and (c) English language proficiency (MTELP) scores.

3. There are no significant correlations between: (a) modified gain scores (MGS) and GPA of the two college groups; (b) MTELP scores and either GPA or MGS of the experimental and control groups; and (c) attitude toward PI and either the GPA or MGS of the experimental group.
4. There are no significant differences among means of the MGS of the three groups of students, namely: the experimental college group, the fourth year high school, and the first year high school.

The procedure consisted of three main phases: (1) the developmental phase; (2) collection of data; and (3) analysis of the data. The developmental phase involved the development of two PI modules, a 157-frame linear type on child rearing practices and guidance, and a 79-frame branching type on personality development, Erikson's theory. Included in the developmental phase was the preparation of a course outline using equivalent subject matters to that used in the PI modules, and a criterion test to measure the learning performance of the students in the samples.

The other main phase of the procedure was the collection of data in the Philippines. In order to collect data, two samples were used. One consisted of 34 third year college students enrolled in a class in child development and guidance in home economics. Seventeen of these were randomly assigned as the experimental group using the PI modules while the other 17 composed the control under the direction of a teacher using conventional lecture and discussion on subject matter.

equivalent to the PI modules. The other sample was the high school students consisting of 29 from the fourth year and 28 from the first year. The materials used in the study were the four developed instruments: two PI modules for the experimental group; a course outline for the control; and a criterion test used for both groups. In addition, the "Michigan Test for English Language Proficiency" and Balfour's "Scale for Measuring the Attitude of Prospective Home Economics Teachers Toward Programed Instruction" were also used in the study.

The evaluation procedure consisted of formal testing with the target population (home economics college students), further testing for appropriateness to grade level of the PI modules with the non-target population (high school homemaking students), and an interview with the college students only. In analyzing the data gathered appropriate statistical measures were used.

Before the questions asked could be answered and the hypotheses tested, assessment of the developed criterion test was done. The majority of the test items in the criterion test had met satisfactorily the requirements given by test specialists. A few of the items, however, were found weak in terms of item difficulty level and item discriminating power. Validity and reliability were satisfactory.

In the light of the quality and limitations of the criterion test, and other limitations in the study such as limited sample size, specificity of the samples, and limited time of experimentation in the Philippines, the major findings were discussed in relation to the questions posed and the hypotheses formulated in the study. These findings were:

1. Selected concepts in child development and guidance could be programed, evidences of which were the two developed PI modules.
2. Students in the experimental group in the college sample learned significantly from the two developed PI modules. Students in the control (college) also learned significantly from the conventional lecture and discussion on subject matter equivalent to that used in the PI modules. Thus the first hypothesis was rejected. However, as regards the time of completion in working with the equivalent materials, the experimental group was 1.5 times faster than the control. The error rates of the students on frames for each PI module was averaged and became the mean error rates for each PI module. Both PI modules had a low error rate on frame responses, lower than seven per cent. However, the error rate on the criterion test of these students, categorized for each PI module, was high. When averaged for each module, PI Module I had an error rate of about 39 per cent, while PI Module II had about 46 per cent.
3. In comparing the posttest scores between the experimental and control groups in college, their initial differences in pretest, GPA and MTELP scores were equated. No significant difference existed between the two groups. The experimental students learned as much as the control students. Therefore, the second hypothesis was accepted. Additional findings in determining the effectiveness of the PI compared to the conventional lecture and discussion did show a greater variability

in scores made on the criterion test by the group in the lecture and discussion method. Furthermore, no difference existed in the retention test between the two groups two weeks after the posttest was given.

4. For both the experimental and the control groups in the college sample a significant positive correlation existed between MGS and GPA, establishing a conclusive relationship between this pair of variables. Therefore, Hypothesis 3a was rejected for both college groups.
5. In the experimental group in college, English language proficiency measured by MTELP, was positively correlated with GPA but the r-value did not reach a significant level. In the control group the English language proficiency (MTELP) was significantly correlated with GPA. Thus Hypothesis 3b was accepted for the experimental group and rejected for the control group in college. Positive correlation also existed between MTELP and MGS of both college groups but the r-value also failed to reach a significant level. Thus Hypothesis 3b was accepted for both groups.
6. In the experimental group, there was a slight positive relationship existing between attitude toward PI and MGS but its r-value was practically nil. A higher positive relationship existed between GPA and attitude toward PI but it did not reach a significant level also. Thus the two sub-hypotheses in 3c were both accepted.
7. In further testing the PI modules with the high school sample (not the target population) it was found that the high school

groups achieved significantly lower (only about one-fourth) than the college sample for whom the programed materials were originally intended. Between the high school groups, the mean MGS was significantly in favor of the first year students who belonged to the upper 15 per cent of the freshman class. The fourth year belonged to the lower 15 per cent of the senior class.

Other findings not included in the hypotheses were discussed.

These were:

1. College students in the sample indicated a favorable attitude toward the use of PI.
2. Many students in the college experimental group preferred using programed materials of both linear and branching provided the teachers would help them by explaining further the materials in the program.
3. Some of the college students preferred to use the programed materials as a supplement only to other materials in classroom instructions.

Conclusions

Based on the findings in this study the following conclusions were made:

1. Regarding PI modules:
 - a. Selected concepts in child development and guidance could be programed for Filipino home economics college students.
 - b. The developed PI modules were effective in teaching selected subject matter in child development and guidance to

Filipino home economics college students.

- c. The developed PI modules could teach 1.5 times faster than the conventional lecture and discussion in imparting knowledge to these Filipino students.
- d. The faster the students read the PI modules the greater was their tendency to commit errors on frames.
- e. Error rates on frames in the developed PI modules were unreliable predictors of the effectiveness of the modules.

2. Regarding PI:

- a. College home economics Filipino students of child development and guidance learned from PI as effectively as from the conventional lecture and discussion in terms of (1) gain in learning and (2) retention in learning.
- b. The "more able" students learned more effectively from the PI than the "less able" ones. However, their attitude toward PI did not influence their learning level.

Recommendations

Several recommendations on the revisions and use of criterion test and PI modules were felt appropriate based on the results of this study.

- 1. a. Revise criterion test giving consideration to item difficulty level and discriminating power of each item. Some items will be deleted entirely while others comparable to those taken out in terms of what to measure, should be added.
- b. Increase the number of test items so that the students will consume 1.5 hours for the total test.

2. a. Revise PI modules giving considerations not only to errors made by students on frames but also those made on the criterion test. Certain items in the frame may have been answered right but not fully understood.
b. Increase the materials in the PI modules by giving more examples, particularly in the branching type.
3. When using the PI modules for classroom instruction, have the students take them home for study. If a teacher can build her lecture based on the materials in the PI modules, the students' learning may be strengthened.
4. Use of programed materials not only as a main source but also as a supplement and remedial measure in classroom instructions in the Philippines is recommended.
5. In class, have "slower" students take as much time as they wish to read the PI modules. Give additional materials to "faster" students so that they would not be held back in their learning and at the same time free them from boredom.

Implications for Further Study

1. After the criterion test and PI modules are revised, they could be used to test effectiveness of PI by using a larger sample from a representative cross-section of the target population in the Philippines. This can be done by trying out the instruments in different colleges and universities in the Philippines.
2. A study on development of PI materials might be extended to include other areas in home economics in the Philippines such

as foods and nutrition, clothing, and home management. Particular emphasis should be given to programing skills in classes where there are large numbers of students than are considered desirable.

3. Further study of the variables of attitude toward PI and English language proficiency in relation to learning from PI by using more representative samples from a cross-section of the target population. Extend the study on attitude toward PI to include boredom as a factor in deciding the amount of PI materials to be used in home economics classes.
4. Studies should be expanded to include the use of PI in high-school homemaking curricula in the Philippines.

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APPENDIX A

LIST OF RESOURCES USED FOR PI MODULES AND COURSE OUTLINE

APPENDIX A.1

LIST OF RESOURCES USED FOR PI MODULE I AND
PART OF THE COURSE OUTLINE IN CHILD
REARING PRACTICES AND GUIDANCE

1. Abasolo, Maria Fe D. "Child Rearing Practices in Barrio Cruz-NaLigas." (unpub. M.S. thesis, University of the Philippines, 1961.)
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20. Waring, Ethel B. Principles for Child Guidance. Cornell Extension Bulletin 420. New York: New York State College of Home Economics (May, 1966).

APPENDIX A.2

LIST OF RESOURCES USED FOR PI MODULE II AND
PART OF THE COURSE OUTLINE IN PERSONALITY
DEVELOPMENT (ERIKSON'S THEORY)

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3. Duvall, Evelyn M. "Family Dilemmas with Teenages." Family Life Coordinator, XIV, No. 2 (1965), 35-38.
4. Erikson, Erik H. Childhood and Society. 2nd ed. New York: W. W. Norton and Co., Inc., 1963, 246-274.
5. Erikson, Erik H. "Identity and the Life Cycle." Psychological Issues, I. No. 1, 59 Monograph. New York: International University Press, Inc. 1959.
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APPENDIX B

SELECTED FRAMES FROM PI MODULE I: CHILD
REARING PRACTICES AND GUIDANCE

APPENDIX B.1

EXAMPLES OF LINEAR PROGRAMING AND ITS VARIATIONS
(PI MODULE I, PAGES 13 AND 34)

24 : If a child is aggressive he will likely relate poorly to others. :
 : Therefore, his chances of being accepted as a friend by his :
 : peer group is slim. (True/False) _____ :
 :

True

25 : A child who is egocentric tends to be aggressive. :
 : a. An e_____ person is one who puts one's self as the :
 : center of interest of all acts, most of the time. :
 : b. A self-centered adolescent is e_____. :
 :

a. egocentric b. egocentric

26 : An egocentric adolescent relates (poorly/better) _____ with :
 : his peer group. :
 :

poorly

27 : At about two or three years of age, the child is basically ego- :
 : centric. When the child reaches school age or adolescence he :
 : soon gets involved in the interests of others. :
 : Therefore, the age of the child is (important/not important) :
 : _____ consideration in understanding egocentricity :
 : in children. :
 :

important

Filipino Parent-Child Interaction and Waring's Principles of Child Guidance

- 47 : Specific meanings given by the family to words, cues, and ges- :
 : tures are learned by the child through interaction with his pa- :
 : rents and other family members. :
 :
 : a. If in a Filipino family, the father always swears in "dirty" :
 : language like Putang ina mo! (You son of a bitch!) when- :
 : ever he gets mad at his two-year old boy or at anything, it :
 : is likely that the child (will/will not) _____ swear :
 : with the same language whenever he gets mad at someone or at :
 : something. :
 :
 : b. If in this same family, the father would whip the child :
 : whenever the child makes mistakes, it is likely that when :
 : the child commits a mistake he (expects/does not expect) :
 : _____ to be whipped. :
 :
 : c. If in the same family, the father approves the friendship :
 : of his two-year old boy and the neighbors' children of the :
 : same age, it is likely that his son (will/will not) _____ :
 : become friendly with these children. :
 : _____

a. will b. expects c. will

- 48 : Thus, what parents consider as right and wrong are communicated :
 : to the child through cues, gestures and words. (True/False) :
 : _____ :
 : _____

True

- 49 : There are Filipino mothers who tell their school-age boys not :
 : to go to the sea but when one day a boy brought home plenty of :
 : fish he caught, the mother would show approval and delight at :
 : the catch! She is (encouraging/discouraging) _____ the :
 : boy to go to the sea. :
 : _____

encouraging

APPENDIX B.2

EXAMPLES OF FRAMES WHERE A RANGE OF 4-9 ERRORS WERE
MADE BY THE EXPERIMENTAL GROUP (PI MODULE I:
PAGES 4, FRAME NO. 13; 7, FRAME NO. 9;
10, FRAME NO. 17; AND 18, FRAME
NO. 49)

13 : In the extended Filipino family, the child often interacts with :
: (more/less) _____ adults than in the American nuclear family.:
:

more

9*: Here are some forms of guidance. Identify each by writing di- :
: rect or indirect on the blank provided for. :
: :
: _____ a. Parents give approval to the child for his good :
: behavior. :
: _____ b. Parents push the child away from the fire. :
: _____ c. Parents provide toys which are free from sharp :
: edges and points for the child to play with. :
: _____ d. Parents tell the child simply, like saying "Move :
: a little farther so your friend can sit, too." :
: _____ e. Parents fix a bookcase so the books are within :
: the reach of the child. :
: _____ f. Parents invite the child's friends to visit with :
: him. :
:

a. direct c. indirect e. indirect
b. direct d. direct f. indirect

*Six students committed errors in item c. Only one error was made in each of items a and b. No errors were made on the rest of the items in frame No. 9.

17 : Why are limits necessary in rearing young children? :

The child is guided in what is acceptable and what is not acceptable to society.

49 : a. Because there are many factors other than child rearing practices influencing the behavior and personality of the child, to predict accurately its effect is difficult. Therefore, one cannot be so sure that the child will possess a certain behavior because he is receiving certain child rearing practices. (True/False) _____

b. Will authoritarian child rearing practices always produce aggressiveness in children? (Yes/No) _____

c. Besides aggressiveness, authoritarian practices may produce fear and passivity in the child. Therefore, he conforms most of the time. (No response needed.)

d. Will permissiveness always develop aggressiveness in children? (Yes/No) _____.

e. Why? _____

- a. True b. No c. No response
 d. No
 e. Because it is difficult to predict accurately human behavior by studying child rearing practices alone.

APPENDIX B.3

EXAMPLES OF FRAMES WHERE NO ERROR WAS MADE BY
THE EXPERIMENTAL GROUP (PI MODULE I,
PAGE 29)

19 : Adults' respect for the child builds the child's feeling of
: self-respect.
:
: Accepting the child for what he is and guiding him in develop-
: ing his potential may contribute to his feeling of _____.

self-respect

20 : Adults' respect for the child contributes to the latter's de-
: sire to achieve.
:
: Parents who accept what the child can do and cannot do and en-
: couraging and giving help where it is needed, are actually fos-
: tering in the child a _____ to _____.

desire; achieve

22 : Giving encouragement and necessary help to the child in doing
: tasks he wants to accomplish may do him (more harm than good/
: more good than harm). _____

more good than harm

23 : Parents who confidently show that the child will succeed may
: contribute to the child's effort to succeed. (True/False) _____

True

APPENDIX C

SELECTED FRAMES FROM PI MODULE II: PERSONALITY
DEVELOPMENT (ERIKSON'S THEORY)

APPENDIX C.1

EXAMPLES OF MODIFIED BRANCHING TYPE (FROM PI MODULE
II, PAGES 1-5)

This is a programmed material about Erik H. Erikson's theory on the life cycle of man. In this program although the pages are numbered consecutively, they are not used like a book where you would open and read the pages consecutively. To use this material effectively, you have to follow instructions carefully, particularly in locating the pages to check your answers.

On most of the pages are found three parts, namely:

- (a) Knowledge of results, such as telling you whether your answer is correct or not.
- (b) New information or explanation, that is, if your answer is correct, new information is given and a question follows; if your answer is wrong an explanation is given.
- (c) Instruction in where to read next.

Turn to page 3.

(2)

Oops! You failed to follow instructions. Go back to page 1 and read the instruction at the bottom of the second paragraph.

(3)

One definition of a theory is that it is a systematically formulated law-like proposition of something.

Can a theory about personality development be formulated?

- (a) Yes.
- (b) No.

If your answer is Yes, turn to page 5.

If your answer is No, turn to page 4.

(4)

Your answer is No. It is incorrect.

Since a theory is a speculative proposition developed in the mind only, and is not necessarily proven by facts, a theory on personality development can be formulated. In fact there are quite a few theories on personality development today.

Go back to page 3. Pick another answer.

(5)

Your answer is Yes. You are right!

One theory on personality development has been formulated by Erik H. Erikson, a psychoanalyst, artist and teacher. He proposed what he calls "The Eight Stages in the Life Cycle of Man." His whole concept is a derivation of the psychoanalytical development of Freud. In each of these stages, Erikson presented positive developments that man should struggle to attain and negative counterparts which he should conquer permanently.

Which of the following is correct?

- (a) Trust is a basic negative trait and therefore man should permanently conquer it.
- (b) Trust is a basic positive trait and therefore man should strive to possess it.
- (c) Trust is neither a basic positive trait nor a basic negative trait and therefore man should ignore it.

If your answer is (a), turn to page 6.
If your answer is (b), turn to page 10.
If your answer is (c), turn to page 7.

APPENDIX C.2

EXAMPLES OF FRAMES WHERE A RANGE OF 3-6 ERRORS* WERE
MADE BY THE EXPERIMENTAL GROUP (FROM PI MODULE
II: PAGES 28 AND 51)

(28)

Your answer: To guide the child with an acceptable behavior...
is correct! Now you are ready for the third stage of Erikson's theory
on the life cycle of man. You've done a good job!

The third stage is called Play Age. The crisis is the struggle
for the development of initiative as opposed to guilt.

Will a three-year old child who has not developed basic trust and
autonomy at the previous stages, be able to pass this crisis success-
fully and possess initiative? Yes or No.

If your answer is Yes**, see page 31.

If your answer is No, see page 32.

*Errors made on the question in the frame.

**Yes is the correct answer given on page 32.

(51)

Your answer is True. You are correct! Good work!

The fifth stage of Erikson's theory on the life cycle of man is Adolescence. This is the transition from childhood to adulthood. Adolescents are torn between what is left of their childhood identity and what are expected of them in the adult world. Such a dilemma is compounded with rapid sexual development at this stage.

Hence, adolescents are generally:

- (a) Sure of their identity as to who they are, and what their roles and functions are.
- (b) In search for their identity, that is, they want to know who they are, what their roles and functions are.
- (c) Not caring to know about their identities, that is, who they are, what their roles and functions are.

If your answer is (a), see page 54.

If your answer is (b), see page 55.*

If your answer is (c), see page 56.

*(b) is the correct answer given on page 55.

APPENDIX C.3

EXAMPLES OF FRAMES WHERE NO ERROR* WAS MADE BY
THE EXPERIMENTAL GROUP (FROM PI MODULE II,
PAGES 59, 76 AND 78)

(59)

Your answer: Re-fight some of the previous battles ... is correct!
It's good that you understand well the basic principle concerning this!

When an adolescent has extreme doubts over his sexual identity and his roles and functions in society, he may have what is termed as role confusion. If an adolescent identifies with someone and loses his identity with the latter, he may have identity diffusion.

Identify which of these adolescents has role confusion and which has identity diffusion.

- (a) Fifteen-year old Pablo lives in a neighborhood where there is an organized gang who molests people and property. Pablo, who has genuine interest in developing what he considers masculine skills like boxing and shooting arrows, is impressed by the gangleader's ability in these skills. He practically worships the leader and acts the way the leader acts.
- (b) Jose is at a loss what to do. His parents still treat him as a child while his uncles, other relatives and friends, want him to become an adult.

Answers to the above questions are:

- (a) Pablo - identity diffusion.
- (b) Jose - role confusion.

Turn to the next page.

*Error made on the question in the frame.

(76)

Your answer: Self-absorption, is correct!

The final stage of Erikson's theory is Senescence. Ego integrity is the positive aspect as opposed to disgust.

Which person has likely developed ego integrity? Which has developed disgust?

- (a) Juana, at 60 years of age, has established intimacy with others, guided the younger generation, and accepts death serenely as a natural event.
- (b) Theresa, at 70 year old, hates herself and others. She despairs over her lack of achievement and fears death. She feels that death does not give her another chance to make a better life.

The answers to the above are:

- (a) Juana - ego integrity.
- (b) Theresa - disgust.

If your answers are wrong, turn to page 77.

If your answers are right, turn to page 78.

(78)

You have done very well. You have just finished all the eight stages. Now, let us try reviewing them.

- A. Erikson's theory on the life cycle of man has how many stage? _____
- B. List the developments and special crises of the following stages:

<u>Stage</u>	<u>Development</u>	<u>Crisis</u>
1. Infancy	_____	vs. _____
2. Early childhood	_____	vs. _____
3. Play age	_____	vs. _____
4. Schoold age	_____	vs. _____

- C. List the last four stages corresponding to their development and special crisis.

<u>Stage</u>	<u>Development</u>	<u>Crisis</u>
5. _____	Identity	vs. identity diffusion
6. _____	Intimacy	vs. isolation
7. _____	Generativity	vs. self-absorption
8. _____	Integrity	vs. disgust

For the answers, see page 79.

APPENDIX D

THE COURSE OUTLINE (INCLUDING THREE SKETCHES)

COURSE OF STUDY FOR SELECTED AREAS IN CHILD
DEVELOPMENT AND GUIDANCE

Level: Junior and senior college home economics students.

Key concepts: Child rearing practices.
Child guidance.
Personality development.

Suggested time: One month (12 lessons, one hour per lesson,
three lessons a week).

Major teaching methods: Lecture, student reports, discussion.

Others: Panel, role-playing, visiting nursery, use of
charts, and references.

Major evaluation: Pretest, posttest, retention test.

Others: Weekly tests (essay).

Daily observation of students' oral responses.

Self-evaluation (students' paper about what they
learned in terms of the stated behavioral objec-
tives of the course).

I. CONCEPT - CHILD REARING PRACTICES

A. Subconcepts

1. Authoritarian
2. Permissive
3. Developmental

B. Generalizations

The development of the personality of a child is influenced by day-to-day social interaction between parents and other adults and the child.

Children reared under authoritarian practices generally become dependent upon authority, lack initiative, self-reliance, and creativity.

Children reared under authoritarian practices relate poorly to peer group.

Children reared under permissive practices are generally aggressive and unruly.

Children reared under permissive practices show lack of purpose or direction to accomplish certain tasks.

Children reared under the developmental pattern develop responsibility.

Children reared under the developmental child rearing practices develop autonomy through maturity.

C. Behavioral Objectives

1. To be able to plan objectives within the specified scope of the course.
2. To increase understanding of the patterns of child rearing practices by demonstrating the following:
 - a. Identify the three patterns of child rearing practices.
 - b. Distinguish the characteristics of each pattern.
 - c. Verbalize how freedom and limits are applied in child rearing practices without one opposing the other.
 - d. Make application of each pattern of child rearing to Filipino parent-child interaction.

(3)

3. To recognize two possible outcomes of each of the patterns of child rearing on the personality development of the child.
4. To develop the ability to make generalizations about possible outcomes of child rearing practices upon the child.

D. Learning Experiences and Evaluation

Evaluation: Pretest.

1. Planning student objectives.

A month after pretest: Ask students what they want to learn within the specified scope of the course. Have them write their objectives stressing on three main areas:

- a. Child rearing practices.
- b. Child guidance.
- c. Personality development.

2. Patterns of child rearing and their characteristics.

Write on board: Child rearing practices. Have students discuss what this phrase means to them.

Assign selected readings printed under Resources for Child Rearing Practices and Guidance (Appendix A.1, page 140). Emphasis should be given on concrete examples of child rearing. Based on examples found in readings, have students agree on the definition of the phrase child rearing practices. Write definition on the board.

Class is divided into three groups. Based upon agreed definition of child rearing practices, each group discusses and lists child rearing practices they have observed in their homes and in their neighborhoods. Each selected leader of the group orally reports the listed child rearing practices to the whole class. The class discusses them.

Evaluation: Oral reports of the groups.

Compare child rearing practices that the class has observed at home and in the neighborhood with those reported by Guthrie and Jacobs in their book Child Rearing and Personality Development in the Philippines (1966) having the following aspects in mind:

- a. Feeding the baby.
- b. Weaning the baby.
- c. Toilet training.

(4)

- d. Dependence-independence upon authority.
- e. Freedom-limits.

Using the same aspects enumerated above, compare child rearing practices in the Philippines with those practised in the United States as reported by Duvall and other authorities on child development.

Present through charts several situations where parent-child interactions illustrate the following:

- a. Dependence of child upon parents.
- b. Independence of child fostered by parents.
- c. Child given freedom as well as limits.

The Sketches

1. Dependence

(Sketch is found on page 165)

:	A sketch of a 10-year old child playing at home with the	:
:	mother watching her continuously.	:
:		:

Pedro and Juana have only one daughter name Diana. Diana is 10 years old. Because they love her very much they want to protect her from all the hurts and pains of living. They watch her "like a pair of hawks." They never allow her to make her decisions for fear that they may not be good for her. Wherever Diana goes or whatever she does, her mother is always with her. Fearful that she might make mistakes, Diana too, does not do some activities at her own initiative. She has to consult her parents on every activity she does.

2. Independence

(Sketch is found on page 166)

:	A sketch of a 10-year old boy getting chopped firewood	:
:	under the house.	:
:		:





(5)

In the same neighborhood, another couple has also one 10-year old child named Jaime. Jaime can do many household chores alone and can make decisions appropriate for his age. For instance, he fetches water from the well or gathers firewood without being told to do so. He makes his own toys and plays with other children in the neighborhood without his parents tailing him around. He even earns by selling vegetables from his garden without depending upon parental encouragement.

3. Freedom and limits

(Sketch is found on page 168)

: Claro, a six-year old, playing near the stream. :

Claro is a six-year old grandson of Ekong. Ekong is a wise old man. He wants Claro to grow up into a man with certain responsibilities and privileges. And so, Ekong wants Claro, even at his young age, to learn certain limits as well as freedom. For instance, Claro can go to the stream but he cannot go to the seashore alone. He must have adults with him. When one day Claro brought a "Katambak" (a kind of fish) he and his companions caught from the sea, Ekong did not show his gladness at seeing the fish. Another day when Claro brought shrimps from the stream, Ekong showed his approval of the catch and even boasted about it to his neighbors within the hearing distance of Claro.

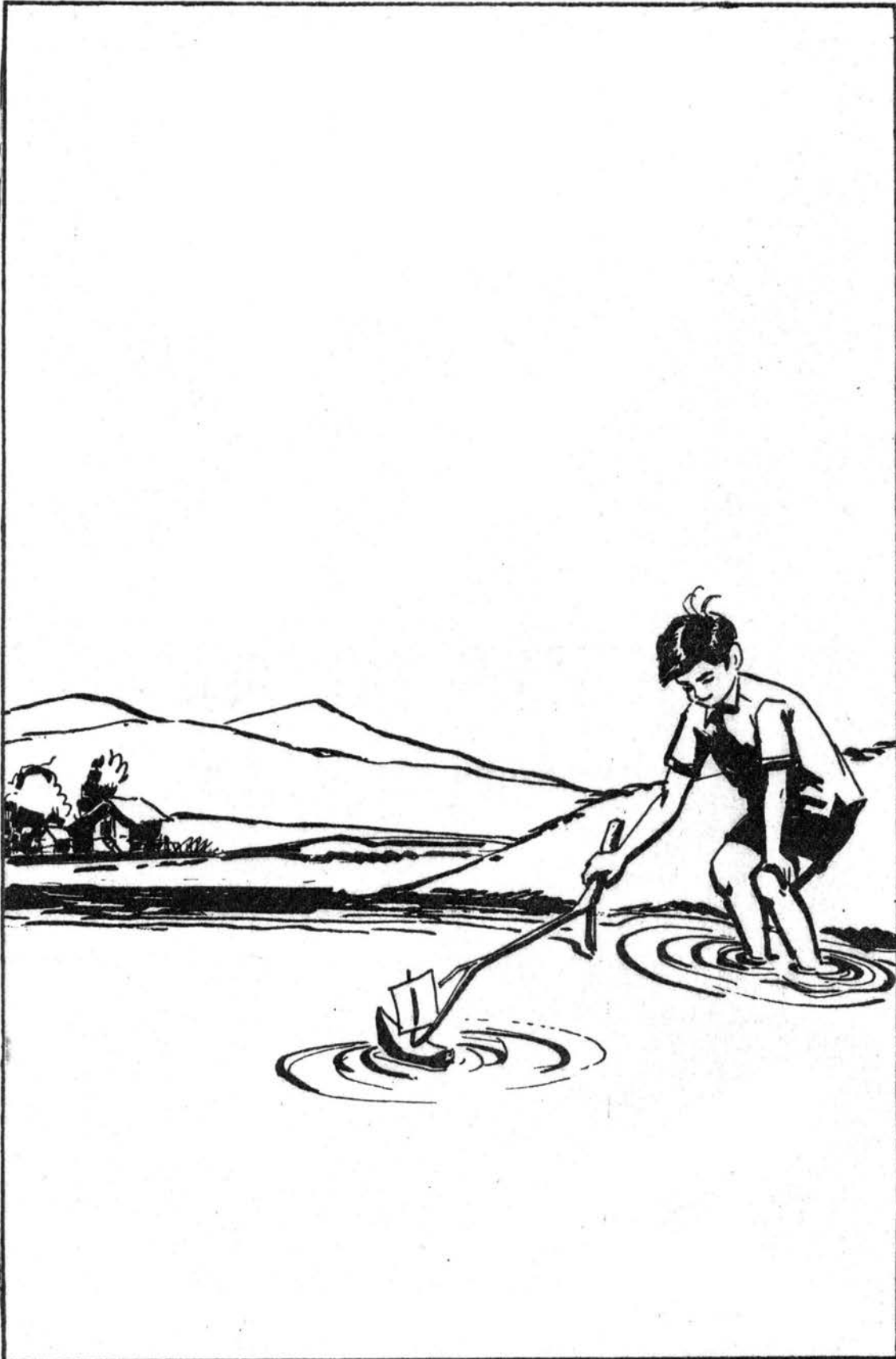
Discuss dependence-independence and freedom-limits. Use situations given in the charts as points of reference.

Encourage students to give their own examples of dependence vs. independence and freedom vs. limits.

Visit a nursery or first grade school. Observe how freedom and limits and dependence-independence are exhibited by the teacher and school children, respectively.

Evaluation:

- a. Have a written report of the behaviors of children observed to have (1) freedom, (2) limits, (3) independence, and (4) dependence.
- b. Using previously learned child rearing practices, identify the amount of limits and the amount of freedom given to the child. Identify also whenever possible, whether children become dependent or independent.



(6)

Write on the board three patterns of child rearing practices:

- a. Authoritarian.
- b. Permissive.
- c. Developmental.

Relate authoritarian to limits. Relate permissive to freedom.
Relate developmental to freedom with limits.

Assign selected readings. Put emphasis on the characteristics of the following child rearing patterns.

- a. Authoritarian.
- b. Permissive.
- c. Developmental.

In your reading on "An Authoritarian Father" by Samuel Butler and "Choice of Weapons" by Edward Newhouse, identify certain child rearing practices which you think are authoritarian.

How does Watson in his article "Some Personality Differences in Children Related to Strict or Permissive Parental Discipline" define authoritarian and permissive child rearing? What are his examples for each?

Lecture and discuss: Characteristics of three patterns of child rearing with the following as the main ideas:

- a. In authoritarian child rearing practices, parents or other adults regulate all activities of the child either for love of power or over-solicitousness for the child's welfare.
- b. In permissive child rearing the parents or other adults let the child have his own way. They do not control him. Instead, they employ lax, inconsistent discipline. The child is free to upset family routine.
- c. In the developmental child rearing the parents grant freedom to the young child and yet set limits on him.

Evaluation: Give a concrete example of Filipino parent-child interaction for each of the following patterns of child rearing: (1) authoritarian, (2) permissive, and (3) developmental.

- 3. Possible outcomes of child rearing patterns.

Assign more readings as listed under Resources for Child Rearing Practices and Guidance (Appendix A.1, page 140). Emphasis

(7)

is placed on the:

- a. Possible outcomes of authoritarian child rearing.
- b. Possible outcomes of permissive child rearing.
- c. Possible outcomes of developmental child rearing.

Class is divided into three panels. Each panel presents to class the possible outcomes of one pattern of child rearing practices on the personality development of the child.

Discuss possible outcomes of child rearing patterns making sure that the following points are included:

- a. Two possible outcomes of authoritarian child rearing: (1) Children become dependent upon authority, lack initiative, self-reliance and creativity. (2) Children relate poorly to the peer group because they tend to be easily upset and egocentric.
- b. Two possible outcomes of permissive child rearing: (1) Children are found to be aggressive and unruly. (2) Children show lack of purpose or direction to accomplish certain tasks.
- c. Two possible outcomes of developmental child rearing: (1) Children develop a sense of responsibility. (2) Children develop autonomy through maturity.

Evaluation: Oral responses of students.

- 4. Generalizations of possible outcomes of child rearing upon the Filipino child.

Assign selected readings with emphasis on generalizations and conclusions made regarding child rearing and personality development in the Philippines. Guthrie and Jacobs should be used as major authorities.

Evaluation: Looking back at child rearing practices in the Philippines based on your actual observations and on your readings, can you apply possible outcomes previously discussed to Philippine culture? If yes, why and if not, why not? What are possible outcomes of child rearing practices in the Philippines on the child?

II. CONCEPT - CHILD GUIDANCE

A. Subconcepts

1. Direct guidance.
2. Indirect guidance.
3. Principles for child guidance.

B. Generalizations (Adapted from Waring).

Guidance can be given either directly or indirectly.

The adult's affection for the child contributes to his feeling of security and belongingness.

The adult's respect for the child builds up his feeling of self-respect and ability to achieve.

The adult's help contributes to the child's increased ability through learning.

The adult's approval encourages the child to develop a set of values through his growing appreciation of his own achievement.

C. Behavioral Objectives

1. To differentiate direct from indirect guidance.
2. To recognize four key principles for child guidance.
3. To apply each of the four principles to different situations of Filipino parent-child interaction.

D. Learning Experiences and Evaluation

1. Direct vs. indirect guidance.

Assign selected readings under Resources for Child Rearing Practices and Guidance (Appendix A.1 page 140). The major readings will be Waring's "Principles for Child Guidance". Emphasis is on:

- a. Child guidance practices.
- b. Direct vs. indirect guidance.

Discuss child guidance practices of Filipino parents in one's home and in the neighborhood.

Discuss further the child guidance practices in foreign cultures.

(9)

Discuss direct vs. indirect guidance.

Classify Filipino child guidance practices and those of foreign cultures into direct or indirect guidance.

Define direct and indirect guidance. Write definitions on the board.

Discuss these two concepts drawing further concrete examples from the assigned selected readings on child guidance.

Evaluation: Briefly explain using your own words the difference between direct and indirect guidance. Visit a nursery or grade school. Note and make a report on activities you can call direct guidance and indirect guidance.

2. Principles for child guidance.

Orally present the following concepts:

a. Affection. b. Respect. c. Help. d. Approval.

Discuss each concept with childhood experiences as points of reference.

Have some students role-play a family where the above concepts are practiced by family members. Have another group of students role-play negative counterparts of such concepts. For instance, an adolescent feels that he is not respected by his mother or father, etc. Discuss how class feels regarding these two families that have just been role-played.

Have students formulate principles for child guidance where affection, respect, help and approval are used.

Lecture on Waring's suggested four principles for child guidance. These are:

- a. The adult's affection for the child contributes to his feeling of security and belongingness.
- b. The adult's respect for the child builds up his feeling of self-respect and ability to achieve.
- c. The adult's help contributes to the child's increased ability through learning.
- d. The adult's approval encourages the child to develop a set of values through his growing appreciation of his own achievement.

3. Applications of principles for child guidance.

In one's own home observe how principles previously formulated and those of Waring's have been applied.

Mention instances (not necessarily happening in one's own home) where such principles were violated. Instances can be true or imaginary. If true, do not mention true identity of persons. Instead, use fake names. Make suggestions as to what should have been done and give reasons for such suggestions.

Evaluation: Using concrete Filipino parent-child interaction, illustrate how Waring's four principles for child guidance can be applied effectively.

III. CONCEPT - PERSONALITY DEVELOPMENT*

A. Subconcepts

1. Theory.
2. Healthy personality.
3. Positive development vs. special crisis.

B. Generalizations/Theory**

In the development of a healthy personality the individual has to undergo several stages where in each stage the individual should struggle to achieve positive development at the risk of acquiring its negative counterpart.

Successful development in a certain stage is dependent upon successful acquisition of positive traits at the preceding stage.

Positive development or trait is not permanently acquired. The individual has to struggle constantly to have it.

C. Behavioral Objectives

1. To identify at least the first five stages, with their

*Limited only to Erikson's theory to make the lessons comparable to the developed programmed material. Erikson's theory is selected because the writer thinks it highly applicable to Filipino culture.

**From Erik H. Erikson's theory on the development of a healthy personality.

(11)

corresponding positive developments and special crises, of Erikson's theory on the development of a healthy personality.

2. To recognize favorable environmental conditions conducive to the development of positive traits, and unfavorable ones responsible for occurrence of negative traits.
3. To make applications of Erikson's theory on personality development to Filipino children.

D. Learning Experiences and Evaluation

1. Erikson's eight stages with their corresponding positive development and special crisis.

Write on board the following concepts: theory, healthy personality, stages, positive traits, and negative traits.

Lecture and discuss the above concepts using previous knowledge on child rearing practices and guidance.

Have students formulate their own theories of the development of a healthy personality of the child. Have some formulated theories written on the board. Encourage students' reactions for and against them.

Present a chart of Erikson's eight stages in the life cycle of man, showing corresponding positive traits vs. the negative traits.

The Chart

Stages	Positive developments and special crises
Infancy	Trust vs. mistrust
Early childhood	Autonomy vs. shame and doubt
Play age	Initiative vs. guilt
School age	Industry vs. inferiority
Adolescence	Identity vs. identity diffusion
Young adulthood	Intimacy vs. isolation
Adulthood	Generativity vs. self-absorption
Senescence	Integrity vs. disgust

Discuss Erikson's general ideas about his theory with the main point as stated below:

In the development of a healthy personality the individual has to undergo several stages where in each stage he should

(12)

struggle to achieve positive development at the risk of acquiring its negative counterpart.

Evaluation: Write Erikson's eight stages on the life cycle of man. Opposite each stage write the positive development and special crisis.

2. Favorable vs. unfavorable environment.

Assign selected readings under Resources of Personality Development (Appendix A.2 page 142). Have the following points in mind:

- a. Meanings and examples of favorable and unfavorable environment.
- b. Positive vs. negative traits and the individual's acquisition of them.

Discuss occurrence of positive traits for each stage under favorable environment. Discuss also risks of special crises under unfavorable environment.

Divide the class into two groups. One group discusses favorable environment and the positive traits that will develop (still based on Erikson). The other group discusses unfavorable environment and the risks of acquiring negative traits.

Each group reports what were discussed by them. The whole class reacts on the ideas presented by the two groups.

Lecture and discuss on these main points:

- a. Successful development in a certain stage is dependent upon successful acquisition of positive traits at the preceding stages.
- b. Development of positive traits is not permanently acquired and so, the individual has to struggle constantly to possess them.

Evaluation: Illustrate how a sense of inferiority in young children can occur. Make feasible solutions so that such children can develop a sense of industry.

3. Application of Erikson's theory to Filipino culture.

Make observations of different home environments in your (student's) barrios and nearby towns. Report and discuss them to class. Would you consider some favorable? Why? Would you say others are unfavorable? Why?

(13)

Discuss the influence of reported home environments on the development of the child's personality, following Erikson's theory.

Discuss the significance of Erikson's theory to you as a future teacher and parent.

Evaluation: Students write a paper about what they gained from the course based on their stated objectives.

Posttest.

A month after the posttest, give the retention test.

APPENDIX E

THE CRITERION TEST

CHILD DEVELOPMENT AND GUIDANCE

Name _____ Yr. & Sec. _____ Date _____

TEST I. Modified True or False: (2% each)

If the statement is correct encircle letter T, if wrong, encircle letter F and make it true by correcting the underlined word or phrase. Write your correction on the space provided below the statement.

Example (T) F 1. Physical growth of the child proceeds from general to specific.

T (F) 2. In the Filipino culture individual independence is highly valued.
family

T F 1. Too much limits given to the child will generally stifle his sense of creativity.

T F 2. A child reared in an environment where freedom as well as limits are given to him generally relate poorly to his peer group.

T F 3. A mother gives her son indirect guidance if she orders him to play in the playhouse.

T F 4. The need to be loved is basic to all children of all ages and nationality.

T F 5. There are parents who do not appear kind and loving and yet manage to convey kindness and love to their children.

T F 6. Parents who do all the decisions for their eight-year old child are respecting that child.

(Continued next page)

(2)

- T F 7. Parental approval for a specific behavior enables the child to see a direct relationship between the behavior and the kind of approval he will get from adults.
-
- T F 8. Parents who acknowledge their mistakes before their children are belittling themselves.
-
- T F 9. Giving the child opportunities to make choices means that he is given freedom to do as he pleases regardless of the consequences.
-
- T F 10. Filipino children often feel more guilt than shame.
-
- T F 11. Erikson theorized that under favorable conditions a child at different age levels runs the risk of meeting special crises.
-
- T F 12. Erikson also theorized that the development of traits at different age levels is independent of age level.
-

TEST II. Selection Type: (2% each)

A. Encircle the letter of the best answer.

1. A sense of industry is acquired in young children through
 - a. learning in school.
 - b. learning at home.
 - c. learning both in school and at home.
2. A sense of inferiority is avoided if the child's effort is
 - a. recognized.
 - b. ignored.
 - c. criticized.
3. One significance of knowing Erikson's theory and those of other authorities on the development of a healthy personality of the child is that the student is helped to
 - a. understand development of children in foreign cultures.

(Continued next page)

(3)

- b. acquire facts or knowledge ready to be given back to the teacher.
 - c. understand and guide children in their present situation as a brother, sister or friend.
- D. Use Juan and Clara's family as a case to base on. Encircle the letter of the best answer.
4. When Juan and Clara got married they decided not to have children. But in their second year of marriage Clara gave birth to Emilia. The child was left to two servants who were not interested in caring for babies. The parents were always out of their home and therefore they seldom saw and held that baby. Juan and Clara should give more
- a. affection
 - b. approval
 - c. help
 - d. respect to their baby.
5. At 10 years old, Emilia was excluded from all family planning and decision-making. If Juan and Clara would make an effort to include Emilia in their planning, they would help meet the child's need for
- a. affection.
 - b. approval.
 - c. help.
 - d. respect.
6. One of Emilia's difficulties in school was solving problems in Arithmetic. Her parents were all college graduates and therefore they could solve those problems. Yet they would not share their knowledge with Emilia because they believed that the child could learn better if she did the problem-solving alone. And so, Emilia struggled alone to solve problems in Arithmetic. She was not successful in most cases. Emilia needed adult's
- a. affection
 - b. approval
 - c. help
 - d. respect so that she would succeed.
- C. 7. Encircle the letters of the two best answers why some individuals in their twenties isolate themselves from the opposite sex.
- a. Because they have attached their identity to others.
 - b. Because they have unpleasant love-life experiences.

(Continued next page)

(4)

- c. Because they have pleasant relationship with themselves.
- d. Because they are popular with their own sex.

TEST III. Matching Type: (1.5% each)

Match Erikson's positive development vs. special crisis under Column B with the stages in Column A. Write only the letters.

<u>Column A</u>	<u>Column B</u>
___ 1. Infancy	a. Autonomy vs. shame and doubt
___ 2. Early childhood	b. Generativity vs. self-absorption
___ 3. Play age	c. Identity vs. identity diffusion
___ 4. School age	d. Industry vs. inferiority
___ 5. Adolescence	e. Initiative vs. guilt
___ 6. Young adulthood	f. Integrity vs. disgust
___ 7. Adulthood	g. Intimacy vs. isolation
___ 8. Senescence	h. Trust vs. mistrust

TEST IV. Identification Type: (2% each)

A. Identify the type of child rearing practices in the following:

_____ 1. Juan boasts that he is a good father because he does all the work for his 10-year old daughter and he would not allow the latter to do anything on her own initiative.

_____ 2. Maria complains that she is a very busy housewife and mother. As a result she cannot keep track of her three-year old son's whereabouts during the day.

_____ 3. In a neighborhood a couple allow their young children to play outside as long as the latter understand that they will not uproot the ornamental plants nor will they go to the streets where buses and jeepneys pass by.

B. Below are particular parent-child relations. Using Erikson's theory on personality development, identify the one positive development or special crisis which will likely occur by writing the answer on the blank before each statement.

_____ 1. Father and mother love their three-month old child. They attend to his physical and emotional needs. As a result, the child feels happy to be with his parents.

_____ 2. One adolescent has a low concept of himself. He hates himself and wants to be someone else like one leader of the "Sige-Sige" gang.

(Continued next page)

(5)

_____ 3. A father has established a happy relationship with his wife and is eager to pass his wisdom on to his children.

_____ 4. An unhappy and retired old man awaits for death fearfully.

_____ 5. At four years old, Lisa is enthusiastic and is eager to try new activities. Her mother encourages her to do them.

_____ 6. At 3-1/2 years old, Pedro is always scolded by his parents for committing mistakes. His parents are perfectionists and so they want Pedro to be like them.

_____ 7. At two years old, Berto found that he could do things for himself. Although he is clumsy, his parents permit him to hold his own glass and spoon and even to button his own shirt.

C. Identify whether freedom or limits are applied by writing your answer on the blank before each statement.

_____ 1. Mother installs a rail near the door so that the child will not fall downstairs.

_____ 2. Mother gives the child choices on what to wear.

_____ 3. Mother tells the child not to play with a bolo.

_____ 4. Mother puts the child in a crib.

TEST V. Completion Type: (2% each)

A. Two types of child guidance are (1) _____ and (2) _____.

B. Three patterns of child rearing practices are (3) _____, (4) _____, and (5) _____.

TEST VI. Generalization.

Some families believe that a child should be given complete freedom regardless of the consequences. And so, they rear their children in an environment free of limitations. Based on these statements answer the questions that follow.

A. (2%) This pattern of child rearing is called _____.

(Continued next page)

(6)

B. Make two generalizations regarding possible outcomes of the pattern of child rearing described above.

(4%) 1. _____

(4%) 2. _____

- End -

APPENDIX F

A COPY OF THE LETTER TO DR. HELEN Y. NELSON

2-D Midi St., Vet. Vill.
Stillwater, Oklahoma 74074

Feb. 25, 1970

Dr. Helen Y. Nelson
Home Economics Education
New York State College of Human Ecology
Cornell University
Ithaca, New York, N. Y. 14850

Dear Dr. Nelson:

I am a Filipino graduate student at Oklahoma State University working toward a doctoral degree in Home Economics Education. At this stage of my work, I am preparing a dissertation proposal about the development and evaluation of programed material in basic child development. Measuring student's attitude towards programed instruction is part of this proposal. I read about your instrument entitled "Scale for Measuring Attitudes of Prospective Home Economics Teacher Toward Programed Instruction," Research Report No. 5, Ithaca: Cornell University, 1966. It seems that Oklahoma State University Library does not have it. May I ask how I can buy a copy of it?

In connection with my proposal, may I ask your permission to use your instrument if I find it suitable to my problem? Furthermore, may I ask permission to modify it if necessary to suit to my study?

I will appreciate very much your kind reply to this letter.

Very truly yours,

(SGD.) (MRS.) PAULITA M. MAHILUM

INDIVIDUAL STUDENT RECORD SHEET

Course related to Family Relations and Child Development already taken:

Total

Retention test score _____

APPENDIX H

INTERVIEW GUIDE SHEETS

Name _____ Date _____

Do you like Programed Material I entitled Child Rearing Practices
and Guidance? Why?

How do you like to use this material?

_____ alone.

_____ with a teacher.

_____ as a supplement.

Did you get all frames correct? ____ Yes ____ No. If not, answer the following:

Number of frames in Programed Material I where you made mistakes ____.

<u>Frame No.</u>	<u>Page</u>	<u>Frame No.</u>	<u>Page</u>	<u>Frame No.</u>	<u>Page</u>	<u>Frame No.</u>	<u>Page</u>
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

Give your comments about these frames.

<u>Frame No.</u>	<u>Page</u>	<u>Criticism</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

(Use extra sheets if necessary)

Do you like the Programed Material II entitled Personality Development? Why?

Do you like the remarks such as "Good work", "Well done", and others after each correct answer? Why?

How do you like to use this material?

- ☐ alone.
- ☐ with a teacher
- ☐ as a supplement

Number of frames in Programed Material II where you made mistakes _____.

Give your comments about these frames.

Page

Criticism

This image shows a single page of white paper with horizontal black ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. On the left side, there is a vertical margin or binding edge where the lines do not extend to the very edge, creating a narrow left margin. The paper appears to be from a notebook or a standard ruled document.

(Use extra sheets if necessary)

APPENDIX I

POSTTEST SCORES FROM THE ODD-EVEN NUMBERED ITEMS OF THE CONTROL AND EXPERIMENTAL COLLEGE GROUPS

Subject	Experimental		Control	
	Odd	Even	Odd	Even
1	30.0	28.0	29.5	28.0
2	32.0	28.0	24.0	23.5
3	30.5	30.5	44.0	36.0
4	25.0	28.5	31.0	39.0
5	24.5	26.5	20.5	19.5
6	26.0	32.0	23.5	21.5
7	33.0	29.0	19.0	13.0
8	26.0	16.5	25.5	27.5
9	30.5	28.5	34.5	33.0
10	21.5	12.5	28.0	27.0
11	38.0	38.0	22.5	34.0
12	28.0	38.0	36.0	38.0
13	32.0	36.0	38.0	46.0
14	31.0	39.0	32.0	30.0
15	18.0	17.5	24.5	21.0
16	25.5	14.0	17.5	11.5
17	25.0	25.0	36.0	42.0

APPENDIX J

DATA ON ITEM ANALYSIS OF CRITERION TEST BASED ON POSTTEST SCORES OF THE COLLEGE SAMPLE

Test type	Test item No.	Difficulty level		Discriminating power		
		No. of students with correct answers	% of students with correct answers	Upper 27% with correct answers	Lower 27% with correct answers	Discriminating power value
I	1	32	94	9	9	0
	2	16	47	3	2	+0.11
	3	20	59	2	6	-0.44
	4	34	100	9	9	0
	5	32	94	9	8	+0.11
	6	24	71	9	6	+0.33
	7	28	82	6	8	-0.22
	8	9	26	5	0	+0.55
	9	6	18	4	0	+0.44
	10	18	53	4	4	0
	11	13	38	5	2	+0.33
	12	17	50	8	3	+0.56
II	A-1	21	62	3	6	-0.33
	2	19	56	6	1	+0.56
	3	30	88	8	6	+0.22
	B-4	28	82	8	7	+0.11
	5	8	24	3	3	0
	6	27	79	8	7	+0.11
	7	31	91	9	8	+0.11
	8	6	18	1	0	+0.11
III	1	33	97	9	8	+0.11
	2	29	85	9	6	-0.33
	3	23	68	9	2	+0.78
	4	24	71	9	2	+0.78
	5	24	71	8	3	+0.56
	6	23	68	8	6	+0.22
	7	20	59	7	2	+0.56
	8	24	71	9	4	+0.56

APPENDIX J Continued

Test type	Test item No.	Difficulty level		Discriminating power		
		No. of students with correct answers	% of students with correct answers	Upper 27% with correct answers	Lower 27% with correct answers	Discriminating power value
IV	A-1	8	24	3	4	-0.11
	2	4	41	5	2	+0.33
	3	16	47	7	0	+0.78
	B-1	16	47	7	0	+0.78
	2	9	26	7	0	+0.78
	3	8	24	4	0	+0.44
	4	12	35	8	0	+0.89
	5	13	38	7	0	+0.78
	6	5	15	3	0	+0.33
	7	7	21	3	0	+0.33
	C-1	31	91	9	2	+0.78
	2	32	94	9	7	+0.22
	3	32	94	9	8	+0.11
	4	28	82	9	5	+0.44
V	A-1	18	53	7	4	+0.33
	2	18	53	7	4	+0.33
	B-3	27	79	9	5	+0.44
	4	27	79	9	6	+0.33
	5	27	79	8	7	+0.11
VI	A-1	19	56	8	7	+0.11
	B-2	14	41	6	0	+0.67
	3	1	21	3	0	+0.33

APPENDIX K

DATA ON TOTAL TIME OF COMPLETION, ERROR RATE ON
FRAME AND ERROR RATE ON CRITERION IN
PI MODULES I AND II

APPENDIX K.1

LENGTH OF TIME (HOURS) SPENT ON PROGRAMED MODULES
AND FRAME RATES/HOUR OF COLLEGE
EXPERIMENTAL GROUP

Subject	Total time (hours)		Frame rate/hour	
	Module I	Module II	Module I	Module II
1	2.50	1.23	62.8	64.2
2	3.02	1.05	52.0	75.2
3	2.98	1.20	52.7	65.8
4	2.75	1.18	57.1	67.0
5	2.15	0.98	73.0	80.6
6	2.83	1.13	55.5	70.0
7	2.82	1.23	55.7	64.2
8	3.07	1.03	51.0	76.7
9	3.38	0.82	46.4	96.3
10	2.50	1.08	62.8	74.1
11	2.83	0.83	55.5	95.2
12	2.82	1.33	55.7	59.4
13	4.25	2.22	36.9	35.6
14	2.83	0.75	55.5	105.3
15	3.82	0.67	41.1	117.9
16	3.23	1.33	48.6	59.4
17	2.98	0.83	52.7	95.2
Sum	50.76	18.89	915.0	1302.1
Mean	2.99	1.11	53.82	76.59

APPENDIX K.2

ERROR RATES ON FRAME RESPONSES AND CRITERION MADE ON THE PROGRAMED MODULES BY THE COLLEGE EXPERIMENTAL GROUP.

Subject	Errors on frame responses				Errors on criterion test			
	Total error		Error rate, %		Total error		Error rate, %	
	Module I	Module II	Module I	Module II	Module I	Module II	Module I	Module II
1	21	5	8	9	9	9	31	43
2	11	4	4	7	11	10	38	48
3	39	2	15	4	11	7	38	33
4	15	9	6	17	13	9	45	43
5	19	4	7	7	10	12	34	57
6	14	4	5	7	10	11	34	52
7	18	4	7	7	11	5	38	24
8	21	0	8	0	12	15	42	71
9	15	5	6	9	10	9	34	43
10	29	3	11	6	16	14	55	66
11	8	3	5	6	6	5	21	24
12	24	3	9	6	9	8	31	38
13	11	3	4	6	11	5	38	24
14	8	0	3	0	8	7	27	33
15	17	7	7	13	14	19	48	90
16	16	4	6	7	14	14	48	66
17	14	2	5	4	17	6	69	28
Sum	300	62	116	115	192	165	661	783
Mean	17.65	3.65	6.82	6.76	11.29	9.71	38.88	46.06

APPENDIX L

DATA ON GPA, MTELP, CRITERION TESTS (PRETEST,
POSSTEST, AND RETENTION TEST) AND MGS
OF THE COLLEGE* AND HIGH SCHOOL
SAMPLES

*The experimental college group includes attitude to PI.

APPENDIX L.1

DATA FOR THE EXPERIMENTAL AND CONTROL COLLEGE GROUPS

Subject	GPA	MTELP	Attitude to PI	Pretest	Post- test	MGS (%)	Reten- tion test
<u>Experimental group</u>							
1	3.33	58	2.51	33.5	58.0	36.9	60.0
2	3.59	59	2.59	28.0	60.0	44.5	54.0
3	3.55	48	2.46	27.5	61.0	46.2	58.0
4	3.70	64	2.46	22.0	53.5	40.4	63.0
5	3.06	55	2.82	10.0	51.0	45.6	56.0
6	3.00	58	2.00	40.0	58.0	30.0	56.0
7	3.23	51	2.39	21.5	62.0	51.6	64.0
8	2.81	55	2.33	23.5	42.5	24.8	46.5
9	3.29	61	3.13	40.5	59.0	31.1	55.0
10	1.50	45	2.23	15.5	34.0	21.9	32.5
11	3.35	74	2.62	32.0	76.0	64.8	68.0
12	3.29	53	2.36	27.0	66.0	53.5	44.5
13	3.46	54	2.28	23.5	68.0	58.2	60.5
14	3.91	60	2.59	33.0	70.0	55.3	74.0
15	3.37	51	2.46	21.5	35.5	17.8	43.5
16	3.17	47	2.49	17.0	39.5	27.1	31.0
17	3.37	58	3.17	27.5	50.0	31.1	66.0
<u>Control group</u>							
1	2.53	50		40.0	57.5	29.2	77.5
2	3.40	54		40.0	47.5	12.5	64.0
3	4.07	72		41.0	80.0	66.1	72.0
4	3.68	78		28.0	70.0	58.3	71.0
5	3.23	56		21.5	40.0	23.6	41.5
6	3.18	65		46.0	45.0	- 1.8	41.5
7	2.82	55		16.0	32.0	19.0	57.5
8	3.12	55		22.0	53.0	39.8	40.5
9	3.67	65		30.0	67.5	53.6	62.0
10	3.38	64		42.0	55.0	22.4	53.5
11	2.65	46		24.0	56.5	42.8	53.5
12	3.91	50		23.5	74.0	66.0	65.0
13	4.00	62		36.0	84.0	75.0	76.5
14	3.68	67		32.5	62.0	43.7	58.0
15	2.45	49		25.5	45.5	26.9	59.0
16	2.83	48		19.0	29.0	12.3	49.0
17	4.29	81		42.0	78.0	62.1	80.0

APPENDIX L.2

DATA FOR THE FOURTH YEAR HIGH SCHOOL

Subject	GPA	MTELP	Pretest	Posttest	MGS (%)	Retention test
1	78.4	49	16.0	28.0	14.3	18.0
2	78.9	40	19.0	23.5	5.6	28.0
3	76.7	31	14.0	20.0	7.0	18.0
4	75.5	29	15.5	18.0	3.0	14.0
5	84.8	51	21.5	52.0	38.9	44.0
6	78.1	61	24.0	37.5	17.8	33.5
7	82.1	45	24.0	39.5	20.4	40.0
8	78.4	38	19.5	37.5	22.4	27.5
9	77.8	34	9.5	23.0	14.9	23.5
10	84.5	42	19.5	31.5	14.9	29.0
11	81.0	45	22.0	28.5	8.3	31.5
12	75.7	34	21.5	14.0	- 8.7	18.0
13	77.9	36	19.0	27.0	9.9	27.0
14	70.4	22	14.0	16.0	2.3	16.0
15	77.8	36	18.0	16.0	- 2.4	16.0
16	78.6	47	22.5	22.0	- 0.6	16.0
17	80.1	41	20.0	22.0	2.5	22.5
18	78.8	42	19.0	29.0	12.4	19.5
19	80.7	49	21.5	27.5	7.6	31.0
20	77.0	31	18.0	23.5	6.7	17.0
21	76.2	40	21.0	20.5	- 0.6	11.5
22	79.4	39	19.0	39.0	24.7	29.0
23	79.8	51	16.0	50.0	40.5	27.0
24	79.9	45	15.0	19.5	5.3	20.5
25	80.6	48	25.5	33.0	10.1	37.0
26	77.9	30	10.0	21.0	12.2	14.0
27	77.3	38	15.5	23.0	8.9	19.0
28	75.0	36	21.0	24.5	4.4	17.5
29	78.9	50	26.0	27.5	2.0	25.5

APPENDIX L.3

DATA FOR THE FIRST YEAR HIGH SCHOOL

Subject	GPA	MTLP	Pretest	Posttest	MGS (%)	Retention test
1	88	36	10.0	21.5	12.8	24.0
2	87	46	16.0	20.0	4.8	18.0
3	88	41	20.5	40.0	24.5	41.0
4	89	46	16.0	35.0	22.6	33.5
5	88	42	20.0	42.0	27.5	33.0
6	89	47	20.0	70.0	62.5	64.0
7	88	41	36.0	46.0	15.6	40.0
8	89	56	20.0	62.0	52.5	49.0
9	87	39	13.5	32.0	21.4	21.0
10	88	30	20.0	28.0	10.0	32.0
11	88	37	24.5	28.5	5.3	23.5
12	88	47	14.0	42.0	32.6	25.0
13	88	52	32.5	52.0	28.9	49.5
14	85	40	20.0	25.0	6.2	26.0
15	85	40	18.0	34.5	20.1	32.5
16	84	41	28.5	31.5	4.2	25.0
17	81	30	12.0	15.0	3.4	19.5
18	88	68	40.0	59.0	31.7	55.0
19	85	33	19.5	30.5	13.7	28.0
20	85	45	11.5	32.5	23.7	37.0
21	85	46	18.0	54.0	43.9	33.5
22	84	36	22.0	22.0	0	26.0
23	86	36	14.0	28.0	16.3	34.0
24	85	41	12.0	32.0	22.7	33.5
25	86	46	10.0	24.0	15.6	21.0
26	86	31	15.5	17.5	2.4	25.0
27	84	47	40.5	30.0	- 17.6	45.0
28	85	41	19.5	20.0	0.6	22.5

VITA⁵

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