THE PROCESS OF DEVELOPING NUTRITION
EDUCATION MATERIALS

BY

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T A B L E O F C O N T E N T S

INTRODUCTION

It is easier to build good eating habits than to change poor habits.
An effective means of improving nutrition is through education. "Even if
food for a balanced diet is available and affordable, certain family members
may not receive adequate nutrition because of ignorance or lack of motivation"
(Caliendo, 1979).

In the past 15 or 20 years, many attempts have been made to bring
basic health care to poor communities in developing countries. Millions of
dollars have been spent by the ministries of health, agriculture, and related
agencies to train staffs (health and community workers) to assist the
communities in managing their resources. The results, however, have not
been very encouraging in some of the countries (Shack, 1978). The challenge
for nutrition education is not simply to change nutrition habits formed gener-
ations ago, but also to prevent the acquisition of other irrational attitudes
toward nutrition which result from new, pseudo-scientific information (Sinclair
and Howat, 1980).

Diet patterns and food habits are constantly changing through cultural
borrowing, innovation and price shifts, and with the effects of commercial
advertising and health and nutrition education. Most people in all parts of
the world, even those who are somewhat isolated from the main channels of
communication, derive the majority of their foods from crops that were originally
developed in other regions (Zeitlin, 1981).

An extremely serious situation exists today in relation to nutrition
education, nutritional status of the population, and the availability of teach-
ing materials in the rural areas. It is difficult for rural workers to get
suitable teaching materials and they do not have enough knowledge, skills

and resources to develop good nutrition education materials. Most of the materials available are developed by people from other countries or for other purposes not specifically related to foods and nutrition. The problem is particularly acute in the developing countries which account for about two-thirds of the world's population and where the population growth rate is extremely high while the increase in food production is low (FAO, 1975). This is resulting in hunger and malnutrition. The professional, technical knowledge, physical equipment and the supplies required are most apt to be lacking in countries where the need for education and training in nutrition is greatest.

Nutrition education materials are scarce in many developing countries and when available, they do not always reflect the needs and interest of the rural people. Most of the nutrition education curriculums are designed for use in formal (Classroom) settings to meet the educational needs of the health workers. Therefore, when students graduate and go out to the community with important nutrition knowledge and eagerness to teach, they become frustrated due to lack of teaching materials. As Sinclair and Howat (1980) stated "no nutrition education programme can be transferred from one nation to another and in all cases it has to be tailored or adjusted to the specific environment and to meet the needs of the people."

Rural people are very eager and willing to learn the habits of good nutrition. An effective way to improve the health of the whole family is by improving nutrition through education. It is therefore important to develop enough nutrition education materials to help health workers assist more people in understanding how individuals can, through their own efforts, improve their own food intake and nutritional status.

As Alan Holmes has said "education is something quite different from simple teaching." It is not just a question of giving information to be memorized; it demands active and direct participation; it demands effort and learning by doing. (1968) This is true because the objective of education is not only to pass information but to provide a background from which ideas can be formed.

Holmes also insists that teaching aids and educational media are only aids and media and have by themselves, little value. The teacher of food and nutrition must therefore first be trained in nutrition and in educational methods. He or she will then be able to choose the teaching material best adapted to each particular circumstance. He or she will know how to produce these materials in a simple and inexpensive way and most important, how to use them to strengthen the impact of his educational activities.

The purpose of this report is to examine the importance of nutrition education, determine requirements for nutrition education materials for village level extension workers, and to review the objectives, methodologies and the conceptual framework of developing materials for adults. The findings of this report can be used by extension workers to teach rural people about nutrition. It can also be used by teachers to develop cirricula for use in other areas of Home Economics or other health related subjects.

OBJECTIVES OF NUTRITION EDUCATION

A. Why Nutrition Education?

The purpose of any nutrition education is to achieve an improvement in the knowledge, attitude, motivation, skills, and behavior of individuals who are included in the nutrition education process (McLaren, 1983).

"To build a new order in the world." These words, written by the director-general of UNESCO, undoubtedly express the need of man for an integral education, and he (director-general of UNESCO) feels that food and nutrition education is an important part of such education. It has been shown that, in many places in the world, malnutrition is the result of ignorance and prejudices rather than of poverty and shortage of food. As M. Autret says in the foreward to the study by Jean Ritchie (1967), Learning Better Nutrition: "Ignorance is the ally of hunger. Together with poverty, which it often accompanies, it is basically responsible for virtually every case of malnutrition".

Nutrition education "an art and science in itself" according to Leverton, (1974), should begin soon after a child is born. Unfortunately, parents cannot always educate the child well in nutrition, because many parents are ignorant about basic rules of a good diet. They can only teach what they have done or have heard their elders say. This lack of knowledge has been observed in all socio-economic groups and in all latitudes in both developed and developing countries.

There are many definitions of nutrition education, including:

a. "Any communication system that teaches people to make better use of available food resources" (Zeitlin, 1981)

b. "A multidisciplinary process that includes transfer
of information, development of motivation of food
habits where needed" (Leverton, 1974).

c. "The process by which individuals gain the under-
standing, skills and motivation necessary to promote
and protect their nutritional well-being through their
food choices" (Ulrich, 1979).

Regardless of the definition agreed upon, nutrition education seems to
be generally viewed as a form of planned change which involves a deliberate
effort to improve nutrition by the provision of information and other educa-
tional interventions.

There is no dispute that food shortages and hunger are two of the
biggest problems in the world today. Chronic shortages of food and malnutri-
tion take their toll on adults as well as children. The FAO's first world
food survey (1974), which covered 70 countries of tropical Africa and certain
Asian countries concluded that more than half of the world's population was
not adequately nourished. According to the studies, "diet deficient"
countries were those in which average caloric or essential nutrients available
did not meet the allowances derived by the FAO.

Table I shows some of the most common problems of hunger and mal-
nutrition and areas of the country found, (McLaren, 1983).

But, as Caliendo (1979) stated, neither increased food production in
combination with more equitable methods of food distribution and marketing
ensures adequate consumption of nutritious food for every individual. This

TABLE 1 Hunger and malnutrition

Disorder	Nutritional factor(s) involved	Precipitating factors	Major features	Vulnerable groups	Geographic distribution	Numbers affected (very approx.) at any time
Hunger	All, especially energy sources	Food shorage, poverty	Impaired physical, mental performance	All	Lowest socio-economic group developing countries	1000 million
Malnutrition Protein-energy malnutrition	Protein, energy mainly	Early weaning, gastroenteritis, measles, etc.	Retarded physical, mental development marasmus, kwashiorkor	Infants and preschool children	Marasmus mainly urbanizing developing countries kwashiorkor mainly Africa	Mild 500 m moderate 100m severe 10 m
Xerophthalmia	Vitamin A	Rice staple, measles, early weaning	Night blindness eye xerosis, keratomalacia	Young children	S. and E. Asia, parts of M. East Africa, L. America	250,000 annually
Rickets, osteomalacia	Vitamin D	Unfortified milk sunlight lack, drugs	Skeletal deformities	Infants, pregnant, aged	Urbanizing developing countries, Asian immigrants to UK	Thousands
Beriberi	Thiamin	Non-parboiled rice, alcoholism	Heat failure, nerve & brain damage	Mainly adults	Parts of Asia, cities of Europe, N. America	Thousands
Pellagra	Niacin	Maize (as porridge)	Dermatosis, diarrhoea, dementia	Mainly adults	Parts of Africa, M. East, C. India	Uncommon
Scurvy	Vitamin C	Lack of fruit, excess cooking	Haemorrhages, impaired wound healing	Infants, aged	Mainly desert areas	Rare
Iron deficiency	Iron	Prematurity, milk diet, menstruation	Anaemia	Infants, child-bearing period	worldwide	100s of millions
Goitre	Iodine	Leached soil, ? goitrogens	Thyroid enlargement cretinism, deaf mutism	Females	Hill areas of Asia, M. East, L. America	200 million

From McLaren, D.S., Nutrition and its Disorders, 3rd ed., Churchill Livingstone, Edinburgh, 1981.

means that even if all people had access to a balanced diet, they could not grow and develop properly unless environmental sanitation as well as medical and educational facilities existed in combination with nutritious diets.

A study was done at the National Institute of Nutrition in 1976 to measure changes that had occurred in the socio-economic conditions, dietary intake and nutritional status of families over a decade. The findings of of the study showed that even though there was an increase in the educational status and employment of family members, the environmental sanitation remained practically the same. Also the diet and nutrient intake did not change much over time (Thimmajamma et al,1976).

A similiar study was conducted by Hernandez et al (1974) and others to assess the effect of agricultural development on nutrition. Surveys were made both prior to, and following the implementation of the agricultural programme. Findings of the study revealed that agricultural production increased dramatically (six fold) over a period of 13 years, whereas in the same period the population only doubled. Even though the average food intake rose, the authors reported that the change was the result of the economic impact of the higher income group. In general, the findings showed that agricultural development alone does not necessarily alter the feeding pattern of low income peasants nor does it prevent malnutrition.

These and many other studies reveal that the problem of malnutrition is not only economic. This means that higher income does not always or automatically result in higher nutritional status. The malnutrition problem is a combination of variables such as social, psychological, and cultural factors affecting the acceptability and consumption of food.

Nutrition education is important if the problem of hunger and malnutrition is to be eradicated. People must be taught practical ways to

satisfy their needs. Lack of knowledge of the simplest facts of nutrition is at the root of a high proportion of the cases of malnutrition today.

This does not suggest that knowledge is the all-in-all, but as Moxley (1981) puts it, "knowledge is requisite to wise decision making". Therese Drummond (1975) believes that nutrition education should be a part of a global effort for libration from hunger, diseases and inhuman conditions.

"Education in nutrition is a necessary part of practical programmes to improve human nutrition." This statement by Zeitlin and Formacin (1981) stresses the importance of nutrition education. The goals of nutrition educators vary from producing simple behaviour modification, at one extreme, to educating individuals so that they can make intelligent food choices, to consciousness raising.

Nutrition is considered as one of many areas in which communities are encouraged to take control of their living conditions. Nutrition education also teaches better uses of resources which are already available to the family.

The unifying thread of the work of Paulo Freire (1976) is critical consciousness as a driving force for bringing about cultural freedom. "Conscientization" represents the awakening of critical awareness. This means that people will be able and free to take total control of their problems with encouragement through nutrition education.

In order to effect change in nutritional habits and behaviours of people in developing countries, it is reasonable that as much time, skill, money, and effort be devoted to the educational aspects of nutrition and of health change as is devoted to the pursuit of scientific knowledge and technological instruments needed for change.

B. Changes in Attitude, Behavior, and Knowledge

1. How Food Habits Change

The beliefs of what is proper to eat and what is an acceptable manner
of eating are learned very early in life. It is well documented that behaviors
can or may change before attitudes and that attitudes are more resistant to
change than was previously supposed (Swanson, 1972). The food habits of a
community are influenced far more by cultural and social factors than by
the recognition of nutritional requirements.

Lowenberg (1981) pointed out that the greatest difference between
man and other animals is man's ability to pass on accumulated knowledge through
speech, and that the most important of the habits passed on are in the area of
food and eating.

As noted by Berg (1973), biological, psychological, sociological,
religious, economical, technical, and other factors govern food practices, with
the result that eating patterns are a relatively flexible aspect of personal
life.

Cultural changes follow the laws of social learning and diffusion of
innovation (Zeitlin, 1981). These are the same principles by which all kinds
of cultural practices are transferred from one group to another. No culture
is ever totally static. This has tremendous implication for those who wish
to modify food behavior. Because cultures are dynamic, they constantly adapt
to changing environmental conditions. It is therefore essential to know not
only what change would be accepted, but how planned change might be most
successfully introduced.

An illustration on the process of diffusion of innovation by Rodgers and Sheomaker (1971) reveals that the spread of new ideas and practices that occurrs spontaneously, without any deliberate educational effort, cannot be counted on to reach those people who are most in need. According to the illustration, a change agent who brings a new idea or practice to a community for example, is the nutrition educator. Suppose that the new feeding programme is one that is not familiar to the community. They may have negative feelings about the practice. If the idea is learned from explanations and demonstrations given by the educator, from listening to the radio and from communication between community members, the mothers will be motivated and because of this, they will anticipate some benefit, like social approval or the feeling of being good mothers. After the first trial at home, some will decide to repeat the demonstration and may continue with the practice regularly. They will then become adapters. But their continuing practice will depend on the relative advantage they perceive that they have gained by the behavior.

Many theories and methods for learning and changing behaviors have been developed over the years. Hochbaun and Rosenstock proposed that an individual, before taking a health-related action must:

1. Perceive the issue as important

2. Believe himself/herself to be susceptible to the condition

3. Believe the problem is serious

4. Perceive the intensity of the threat with such great anxiety as to paralyze his ability to act, and

5. Believe the action to be effective and be able to take it.

Lewin (1943) provides insight into the issue of how to intervene into a situation in a way as to produce a readiness for change and a procedure to follow through. He outlined a five-phase procedural theory of change:

a. The unfreezing phase - This is when clients become ready to consider changes for themselves.

b. The problem-diagnosis phase - Unfreezing makes it possible for a client to identify forces supporting the need for change and those working against the changes needed and to analyze those forces in terms of how and where changes can be introduced.

c. Goal setting phase - Client is able to establish specific goals or directions toward which changes are desired.

d. New-Behavior phase - client is able to experiment with the range of new behaviors which have become possible options and practice those which are found to be the most desireable.

e. The Freezing phase - When newer learnings and changes have been found to be beneficial and are assimilated into a more permanent, ongoing frame-work of behavior.

Another useful theory of behavioral science for health-educators and behavioral scientists alike is the hierarchy of motivational needs, developed by Maslow (1943). The five basic human needs that he identified include: Physiological, safety, love, esteem, and self-actualization.

Self-actualization
Esteem
Love
Safety Needs
Survival Needs
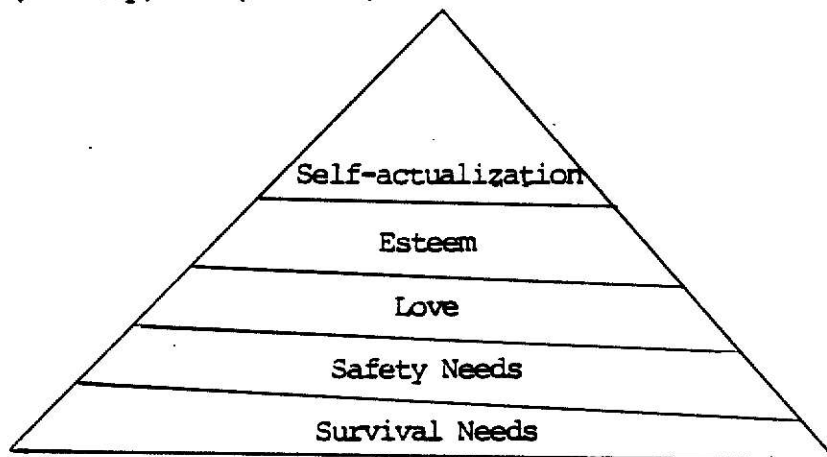
People must first meet their basic needs for food, clothing, shelter, in order to meet other needs.

Despite the differences between authors in regard to the steps or methods of changing human behavior, there are still some underlying similarities in the theories. Most of the theories stress one or more concepts about the learner or individual to be changed. All the theories emphasize that changing behavior involves some kind of knowledge and active participation on the part of the person to be changed and motivation on the part of the person doing the changing. This means that the learner sees (perceives) the need for change, sets goals for accomplishing those needs, and makes the decision on acceptance and adaptation of new behavior. Swanson (1972) seems to put the steps in a more simple form, thus: (1) Awareness (2) Interest (3) Evaluation (4) Trial and (5) Adoptation.

"A situation in which some men prevent others from engaging in the process of inquiry is one of violence. The means used are not important: to alienate men from their own decision-making is to change them into objects." This statement by Paulo Freire (1976) emphasizes the importance of participation in any planned program which focuses on changing people's behaviors. It means that the individuals must be involved in every step of the program.

2. Attitude Change

Attitudes are defined as emotions or value judgements attached to actions, facts, objects, or states. An example of an attitude shared by many mothers of young children in traditional societies is the belief that it is good to give the best share of food to the head of the household or husband. According to Zeitlin (1981) attitude change should occur as part of the decision to adopt an innovation. Attitude change is most likely to take place if a

-12-

person is sharply confronted with a discrepancy between his or her attitude and some new item of information which he or she takes seriously. The discrepancy can be of three kinds:

1. Between the attitude and information about reality. The mothers attitude could change for example is she learned that the growth of the child might be retarded if he/she did not get enough protein.

2. Between the attitude and the attitudes of significant others. The mother's attitude could change if she learned that her neighbor believed in giving meat to her child.

3. Between the attitude and one's own actions. The mother's attitude could change if she realized that the time and attention she was investing in caring for the child was discrepant with not feeding the child well.

The real measure of effective nutrition education is a change not in knowledge or attitude but in behavior, as well as maintenance of existing desirable behaviors. According to Lowenberg (1981), people are motivated to attain goals that they set for themselves more than those which are set for them.

3. Interactions between Attitudes and Behaviors.

Attitudes and behaviors continuously interact with each other. A person's attitude influences his behavior in ways that affect his experience of reality. Experiences in turn help to shape attitudes. If a mother has the attitude that it is bad to give eggs to her child, she may not do so even when the child asks for the egg that she is eating. As long as the baby shows

no immediate sign or change in health, its relative well-being will confirm the mother's attitude that she was right in not feeding the child eggs.

If, however, the mother feeds the child eggs as a result of a good demonstration at a nutrition center and the child shows no ill effects, the new experience is likely to influence a change in her attitude.

If on the other hand the child becomes sick (gets a cold, measles, etc.) after eating the egg, the mother might associate the child's illness with eating the egg. If the mother believes that eating eggs will cause the child to grow up to be a thief, she will definetly not give the child egg and therefore attitude change is likely not to take place.

Wyon and Gordon's contention is that "behavior is based on experience" as it is perceived. In many situations a mother recognizing the increased incidence of diarrheal infection when supplemental foods are given and knowing the incidence of mortality from the infection, makes a conscious decision to withhold such foods. What she will fail to recognize however is the protein-calorie malnutrition or dehydration which results from withholding such foods, which leaves the child less able to resist infection. The end result is greater likelyhood of child mortality than should be the case from diarrheal infection alone.

According to Church (1971), attitude and behavior change depend on the effort and client orientation of the educator, and on the credibility of the institutions and individuals offering the education. Zeitlin (1981), gave some of the teaching practices favoring change as: Enlisting community opinion leaders in the learner group; demonstrations; guided practice with reinforcement; presentation of themes by open-ended questions; discussion; eliciting public commitment before the group; role playing; and actively promoting diffusion.

4. The Effect of Knowledge and Practice

Writers like Westor and Glotzer (1981), Zeitlin (1981), Caliendo (1979), and many others agree that there is not always a positive relationship between knowledge and practice. This means that change rarely results from knowledge alone. However, it has been widely documented that knowledge can promote helpful change when perceptively applied. Many studies have reported a correlation between the educational level of parents and the nutritional status of the family.

As Gifft (1972) stated "Because knowledge is so closely related to other personal and societal characteristics, it is difficult to isolate the influences of knowledge alone on nutritional behavior." It is therefore important that education must include the acquisition and dissemination of knowledge, as well as other factors important in the practical application of that knowledge to personal needs and life situations. For example, nutrition education must explain to the people the basic concepts of food and how to select and prepare nutritious meals, as well as teach people how to apply this knowledge of nutrition in their own lives. This means that people must be able not only to know about the foods, but also to use the foods.

C. NonFormal VS. Formal Education

Education is a structured process that aims at providing rational understanding and that creates a new way of analyzing facts and information. It is this acquisition of capacity for analysis, synthesis, and generalization that may result in a conscious change in behavior (McLaren, 1983).

Two areas of education can be distinguished, one within the formal system of primary, secondary, and tertiary institution, the other embracing adult education or extension activities.

There is no simple word to describe informal education, which is concerned with the dissemination of knowledge among the general public, irrespective of age group. The term 'nonformal' may be used as convenient shorthand for a wide range of educational exchange including adult education, community development, extension services, and many others.

Formal education is usually well established within the framework of a national ministry of education, or its equivalent, while nonformal education may be promoted by a variety of bodies and (in respect of food and nutrition), ministries such as health or agriculture. Professional and industrial bodies may also make important contributions. Education can take place in a formal setting such as a classroom as well as in an informal setting as in extension - community centers, outside the building, or in an open place.

The phrase teachable moments was used by Heseltine (1962), to describe those periods when an individual is most ready to learn - when he realizes his need for knowledge or for help with a particular problem. Education

timed to coincide with teachable moments has a good chance of success because
it is easy to involve the active participation of the learner. Teachable
moments occur in both formal and informal education.

The broad organizational patterns for adult learning almost always
give the teacher the flexibility he or she needs to teach in any way he/she
likes or within any pattern that his/her students like.

Paulo Freire's (1976) method of approaching adult literacy, offers
the greater flexibility of teaching methods in adult education. Freire explains
education as the practice of freedom. This means that people decide that
they want to learn, knows the ways to solve their problems and are able
to judge the results of their accomplishments. This is what Friere referred to
as problem-posing type of education.

Participation learning is an educational means for helping adults
to help themselves learn. Participatory learning must therefore be designed
to help participants to accept personal responsibility for themselves and
others. Participation learning, if properly conducted, can contribute sub-
stantially to the individual's ability to successfully interact with
individuals and within groups. Through learning and practicing the concepts
taught in participation learning, individuals will increase their awareness of
their potential. Participants learn to be more willing to share, to help
others, and to build group cohesiveness.

A basic prerequisite for success of nonformal education programs is to
organize them to take place at times when those most in need can participate.
In such a learning climate the participants are unthreatened; are involved in
a collaborative endeavor that can have meaning in their individual lives; are
interacting; are exposed to changing views and are examining differences and

searching for modifications through concensus; agreeing on what is a meaning-
ful goal for the groups; examining and agreeing on what resources are needed
to reach the goals.

It has been estimated that people remember 10% of what they hear,
50% of what they hear and see, and 90% of what they hear, see and do (Saunder,
1974). There is no question that learning methods are most effective when they
involve people in learning skills through guided practice, that is when they
perform with supervision and corrective feedback, behavior that they have learned
by observing others.

Appropriate teaching method is important in adult education because
the adult has far more extensive life experiences that he/she brings to the
learning situation than does the child. The adult is anxious to look at
immediate outcomes from his/her learning experiences, whether they are related
to special content objectives, psychomotor skills or new appreciations. This
is the reason why Klevin (1972) made the following statement about adult
learning - "It is fun to teach adults. They are the most responsive, critical,
concerned, creative, stubborn, challenging, pleasant two-footed animals on this
planet."

Knowles (1955) lists some of the situations in which informal education
has been found to be useful or appropriate as:

>1. When it is desirable to develop special skills-
>This involves practice on basic skills and operation
>by group members who do not possess some basic skills
>necessary to develop those skills through organized
>classes.

2. When it is desired to produce changes in attitudes -
While there is no guarantee that any educational activity
will produce a change in attitude, the informal course
is one of the most promising methods.

3. When it is desired to provide short-term exploratory
experiences preparatory to affiliation with a long-term
program.

4. When it is desired to attract a diversified clientele.

The functions of the leader or teacher in a participatory learning
process therefore are:

  a. To be prepared to lead the discussion,

  b. Adjust the outline and purpose suggested by the group
      or students (if necessary),

  c. Share his/her ideas and experiences, help each member
      to understand what is said,

  d. Avoid channeling discussion through the teacher, and
      listen actively for process problems,

  e. See that participants are aware of the need to draw each
      other into the discussion,

  f. Help keep discussion on the track,

  g. Prevent domination by one or two, and

  h. Accept each other as persons.

The group facilitator (Bergevin and McKinley)

> "The facilitator is a teacher who concentrates his
> teaching efforts to the level of group processes
> and procedures in order to help participants become
> more effective learners and co-learners. The
> facilitator is concerned with improving communica-
> tions, self-understanding, decision making, and
> group operation. He/she is not to serve as a
> source of information about the subject discussed."
> (Bergevin & McKinley)

In summary, for group members to internalize the process of interaction within the groups necessary for effective membership, they must discover the new insights for themselves.

Many studies reveal that informal education is the best approach for adults, most especially in participatory programs because of their tremendous influences and experiences.

METHODOLOGIES

A. Conceptual Framework of Developing Nutrition Education Materials

From the moment of birth the environment stimulates the development
of the brain. Babies learn to respond to other people in very simple ways,
but they rapidly acquire skills which are conditioned by their environment.
Our success in learning depends a lot on the environment and this varies
from culture to culture. A task that one group of people finds simple another
group may find difficult or impossible (Piaget, 1932). Parental attitudes
for example have an effect on the child's eating habits and on toilet training.
Language acquisition is affected by how people talk to their children and what
they say. Physical development is also affected. Babies in Africa are
traditionally carried around on their mother's back. It has been found
that they learn to sit and walk earlier than babies not carried in this way.
An example was given by M. Geber (1960) of children in Uganda who were put
to sleep in cots during the day who started sitting and walking later than
children carried around. It is believed that where children were carried,
their sense of balance and their muscular control were developed through
spending much time upright.

In many traditional societies a child's education consists of
acquiring a fixed body of knowledge and skills. These are largely learnt
through imitative play, stories, and most important of all, family work or
activities. The child's responsibilities then continue to grow as he/she
grows older. After maturity, the child will be expected to work on his/her
own initiative, practicing those skills that he/she has already learned or
acquired in preparation for adulthood (Jenskin, 1981).

-21-

There are a number of books and theories about development, which include Piaget's stages of cognitive development. Piaget called these "successive stages of though development".

In the first stage, which he called "sensorimotor period", the child progresses from instinctual reflexive action at birth to symbolic activities, to the ability to separate self from object in the environment. He develops limited capabilities for anticipating the consequences of his actions.

The second stage (Preoperational period) is the stage when the child's ability to think becomes refined. First, he develops preconceptual thinking, in which he deals with each object individually but is not able to group objects. The child is able to use symbols such as words to deal with problems.

In third stage (concrete operations) the child develops the ability to perform intellectual operations such as reversibility, conservation, ordering of things by number, size, or class. His ability to relate time and space is also matured during this period.

The last stage (period of formal operations) is the period in which the person learns hypothetical reasoning. He is able to function purely on a symbolic, abstract level. His conceptualization capacities are matured.

Just as there are many theories of cognitive development, so has there been increased criticism on each theory. Piaget's critics, (Yussen and Santrock, 1978) for example do not accept fully his claim for stages of development even though they agree that his theory provides a framework for investigation. There is no one theory that can be completely relied on

but at least most writers and experience show that as a child grows, development takes place. At first a child relates to people and objects, and later still he learns to think abstractly. This process, known as cognitive development is not strictly age-related, but it is usually completed between the ages of fifteen and twenty. It is partly a result of physical maturation, partly of human beings will to learn and gradual accumulation of learning experiences, and partly of the stimulus of his environment.

It appears to be true that some cultures give more opportunity for developing intellectual skills than others. Two psychologists, J. Bruner and P. Greenfield (1976), put it this way: "Some environments push cognitive growth better, earlier and longer than others". This does not suggest that different societies produce less intelligent or more intelligent people, or that they offer inferior or superior learning environments. What this means is that cultures are different. Some societies for example, value skills in social relationships more highly than intellectual skills. People then develop those skills and abilities over a number of years to fit with the dominant values and practices of their societies.

Paulo Freire's (1976) method of teaching "conscientization" depends on a particular sensitive dialogue between the members of a learning group and their leaders. This method is not simply theory, but it is from Freire's experience in Brazil and elsewhere. This theory is important in two counts: first the method is designed for people with no formal schooling; second, it is based on the firm belief that people who are not educated are as capable as anyone else, of grasping difficult ideas, once they can use the most effective tools that they already have - which is their command of their own language. Freire believes that illiteracy holds people back from taking full

control of their environment. People can be led to see the need for literacy by discussing concepts that are central or important to their lives.

How People Learn

The reason why a teaching method like Freire's is so effective is largely because it is relevant and linked to experience and partly because it is in harmony with the process of learning. It is helpful to understand this process which, according to R. Gagne (1971) consists of the internal processing of information. A simple description is as follows:

> "Your attention is drawn by a stimulus; you observe or register the material to be learned using one or more of your senses, and hold it temporarily in your mind; you think about the material and decide what to do with it-how to classify it, which bits are important and so on; some of the newly organized material is transferred to permanent memory. The rest falls away, forgotten."

This means that material that is unused for a long time can gradually fade away from the memory. This theory is useful in describing the job of educators. The job of educators is to create the stimulus and opportunity to learn, present the content, make the ordering of information easy, and aid in its recall

Ways of Learning

Janet Jenkins (1981) classified learning in three ways: cognitive, affective and motor learning; in other words, thinking, feeling, and doing. Cognitive learning she said is affected by one's environment. This is the type of learning that schools concentrate on. This type of learning goes from simple responses like those of a mother and child, where the child makes responses (cry, smile, etc.) at the appearance of his mother to higher levels where the child distinguishes between the learning of concepts, of rules, and of principles. People learn a concept when they begin to

think in abstract terms, like putting things into some kind of order or system of classification. Thus, once a child has learned the concept of colors, he can classify his red pencils, books and so on. In order for people to solve problems that they are not familiar with therefore, they usually need to start from general principles. But each level of learning depends on a previous one.

Motor or psychomotor learning is concerned with physcial activity. Physical skills depend on practice and it seems to be difficult for adults to learn completely new physcial skills.

Each kind of learning interacts with the others. A person learning to read for example also learns to remember, and identify the symbols that are used in writing and learns to interprete words and sentences. The person also gathers information from what he reads, which may affect his attitudes and values, or stimulate emotional responses. Motor learning is also involved to a certain extent, like training the eye to move across the page.

This type of analysis helps teachers to determine what to teach and how to teach it. Once a teacher decides on his goals, he must consider how the learners will demonstrate that they have achieved those goals. This reveals that all three types of learning have a place in any kind of education and can help teachers to be able to organize their teaching better.

Benjamin S. Bloom (1956), presents a beautiful and helpful method of identifying learning progression, which he called a "Learning Taxonomy". Bloom presented six levels of learning in a hierarchial form with a progression to each step or hierarchy depending on the mastery of each preceeding level. That is, from simple to complex.

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HIERARCHY OF SIX LEVELS OF LEARNING
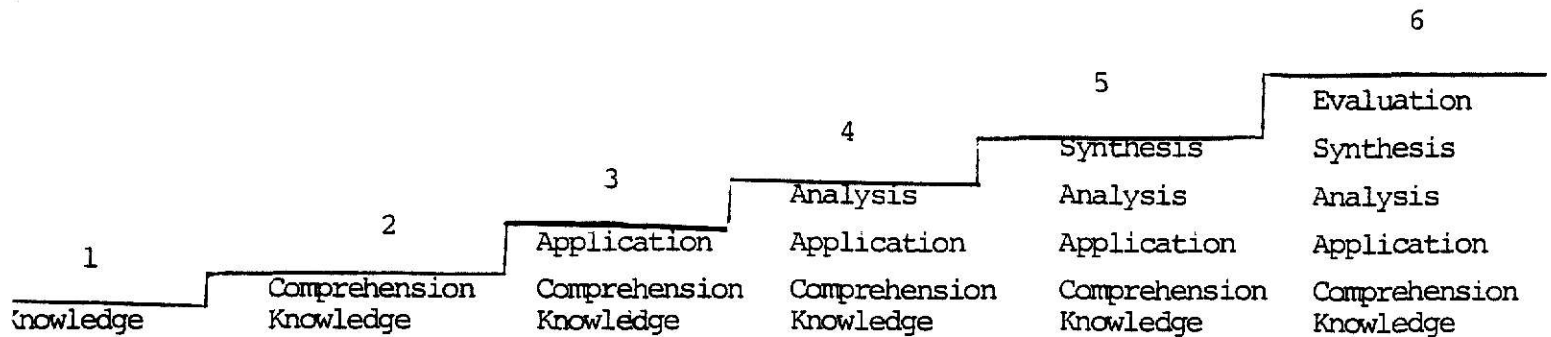
Source: Benjamin Bloom

1. Knowledge. This simply means the remembering of things that were
learned previously. It is the simplest form of learning and
can easily be forgotten after a period of time when information
is not used. EXAMPLE: of cognitive outcome - define, repeat,
list, record, recall, name and underline.

2. Comprehension. This means the ability to grasp the meaning of what is being communicated and to be able to use the materials. This is the lowest level of understanding. The meaning can be translated into different words to suit the language of the student. EXAMPLE: Translate, restate, discuss, describe, identify, locate and report.

3. Application. This is the ability to use learning material to solve problems in a concrete situation. This level of learning is higher than comprehension because it involves the ability to apply. EXAMPLE: Interprete, apply, employ, demonstrate, use, dramatize, schedule, sellect, and use.

4. Analysis. This is the ability to breakdown materials into organizational components. This level of learning requires the ability of the learner to examine critically the reasoning behind an argument. This type of analysis tests the students ability to use formal logic. EXAMPLE: Distinguish, analyze, differentiate, appraise, calculate, experiement, test, compare.

5. Synthesis. This is the ability to work with elements of the material and be able to combine them into creative structures. This type of learning demonstrates uniqueness and originality and also reflects a situation where the right solution is unlikely to be set in advance. EXAMPLE: Plan, propose, design, formulate, arrange, assemble, collect and construct.

6. Evaluate. This is the ability to judge the value of ideas according to criteria developed for appraisal. This involves distinguishing facts from opinion. This is the highest level of learning and represents highly conscious considerations based on adequate comprehension and the analysis of the phenomena to be appraised. EXAMPLE: Judge, rate, compare, revise, score and select.

This kind of concept is important especially in developing programs, sellecting and producing teaching materials for nutrition education or any kind of education that is meant to convey certain ideas, depending on the level of the learner and the level of achievement that the teacher plans to reach. Most adult teaching can reach higher levels if planning of program and teaching materials are carefully selected. Instead of teaching people to memorize and recall the four food groups for example, they can reach the level of application by actually selecting and using foods from each group and be able to plan balanced meals. This can simply be done by seeing, hearing, and participating in the activity and can be kept in memory by practicing.

Age and Learning

The wide range of experience of adults helps them to learn. By relating new information to that wider experience they can often understand and learn more quickly than young people. Naturally the effect of age on learning varies greatly. If people keep practicing a skill, whether cognitive or motor, they can retain competency at it.

B. Developing Nutrition Education Program /Materials

The person intending to develop a nutrition education program or materials, whether concerned with societal, community, family or individual goals, begins with information about nutrition problems and their determinants. Whatever structure programs take, they should be based on background information concerning the availability and quality of food, the environmental conditions affecting nutrition, and the nutritional status of individuals or population group.

Any local agricultural or health worker is in close contact with the members of the community in which she works. She should therefore be familiar with local customs, be able to discuss local problems, and be eager to assist in developing a solution to these problems.

Some important questions to answer when developing a nutrition education program or materials are:

1. Who is malnourished or affected?
Young children, from 6 months to 5 years of age, are at greatest risk from malnutrition. Berg (1973) has compiled Latin American data indicating that malnutrition is an underlying or associated cause of between 52 and 70% of all deaths between the ages of one and four years. Further, those malnourished children who survive may by physcially and mentally debilitated. This does not suggest or mean that only children are affected by hunger and malnutrition, but the problem seems to be more noticable in children because of their increased demand for nutrients necessary for growth.

2. Which types of malnutrition occur?

Local health workers should be able to provide information on this point. Inadequate food intake resulting in energy deficiency is generally the most common problem, though quality and quantity of the protein intake may be inadequate especially for young children. Anemia is likely to be present. Vitamin A deficiency may also occur.

3. Why does this problem occur?

This may be related to the types of foods grown in the area. The agricultural or health worker should be familiar with locally grown foods in the area. She should be able to judge if the amounts grown are likely to be adequate and if the types of food grown will allow a sufficiently varied diet. She should be able to determine the amount of food lost in storage and preparation.

4. Which are the target groups?

Using the information obtained relating to malnutrition, the workers need to decide the target groups on which to focus. In most developing countries, where all age groups appear to suffer from the effects of food shortage and nutrient imbalance, nutrition education will be more effective if it is extended to all members of the family. The tendency is often to direct nutrition education largely to women, but other groups in the community should also be reached. Nutrition education is not always targeted at the most malnourished.

Men often have considerable influence on family food supplies by controlling the use of any money or cash income by their traditional priviledges in food distribution, and by their authority over their wives.

Children are future food producers and consumers and should be encouraged to appreciate the importance of agricultural development and food habits. This is particularly important because while the child is still under school age his dietary habits are under the direct influence of his parents and many of the family eating habits may be quite unsatisfactory because of the scarcity of essential foods and lack of knowledge of their use and distribution within the family.

5. What should the nutrition message encourage?

This will depend on the specific problems of the community and on the target groups. In general, the most important aspects of nutrition education for most developing countries should include:

a. The production of acceptable foods of high nutritional value

b. Sensible budgeting

c. Foods and its handling

d. Nutrients and dietary components, including nutrition and physical activity

e. Food selection. This should include the knowledge of simple food values of various staples and supplementary foods.

6. What should the nutrition message be?

This will depend on the selected nutrition message. Some suggested message areas for inclusion in a program are:

- improvement of variety and amount of foods produced for home consumption.

- The special food needs of children and pregnant and lactating women

- The value of money when buying food.

- The need to relate family size to family resources.

- The total workload of women

The Food and Agricultural Organization of the United Nations has suggested that the message to be presented should be:

a. Accurate.

b. Expressed in simple and familiar terms.

c. Relevant to the local situation.

d. Straight forward.

e. Coordinated with colleagues in other community programs in order to:

- increase impact

- avoid presentation of conflicting information which may confuse the target group

- avoid unnecessary duplication of effort.

The two most important things to remember in the development of materials for nutrition education according to Sinclair and Howat (1980) are that the material should be relevant to the daily lives of the people using it and that the method used for transmitting the material should be suited to the audience. All educational materials should be written simply, in a style that is straightforward and uncomplicated, reflecting the natural flow of coherent speech.

1. Regional Divisions - based on administrative structure

2. Ecological sub-zones
        including, e.g. urban
                        rural accessible - irrigated; unirrigated
                        rural inaccessible - arable; grazing

        as well as subdivisions by cropping areas

3. Economic status of sub-groups of population
        including, e.g. urban - migrants recently arrived
                        - poor, stable employment:
                                in large firms
                                in small firms

                        - poor, unstable employment or unemployed
                        - income above subsistence

                rural - settled farmers - "surplus" farmers   Break down by
                                                                income

                                        - "deficit" farmers   Classes and by
                                                                size, tenancy,
                                                                etc.

                        - landless
                        - nomads

4. Demographic categories within sub-groups
        including, e. g. mother - child infants   Incidence in relation to family
                        pre-school children   size, birth order, etc.
                        school-age children
                        adults - male
                               - female
                        elderly

5. Deficiency pattern
                        chronic
                        seasonal   Nature of Hazard
                        occasional

6. Nutrient deficiency (Or Problem)
                        Protein-calorie   calcium
                        Vitamin A   iron
                        Riboflavin   iodine
                        Vitamin C   lathyrism

C. Steps in Planning Nutrition Education Program

Planning may be considered as the framework for meaningful educational leadership. The reason for this is simple; so many aspects of the educational process rely upon sound planning for their success. Whether the teacher or educator is engaged in development, management, or evaluation, planning processes must be considered and eventually applied if one is to have reasonable success as a supervisor or teacher. In a broad sense, planning may be considered as "the process of forecasting the future and then preparing for it" (Mastrine, 1981). However, two basic aspects of planning should be noted. First, planning must be systematic. Haphazard efforts that have little relationship to each other are counterproductive. Second, planning must be continuous. Sound planning efforts do not begin and end; they are ongoing activities that reflect a constant tie with the educational process. That is why Mastrine made the following statement: "The function of program planning in nutrition education is not an end of itself."

As Joy and Payne (1975) explained it, planning stages are seldom clear-cut nor do they follow in orderly sequence with each beginning as the other ends. Effective planning in nutrition education therefore needs to focus on the development of a course of action that is meaningful, attainable, and results oriented, and it should result in a positive impact on the problem area. For any planning to be successful, it must take into account real world, social, political and economic considerations and identify the potential impact of the desired outcome of the program.

This is why it is important that adult (participatory) learning en-vironment makes provision for people's development of knowledge, manipulative skills, attitudes, and values as well as the integration of these areas and

their application to home situations. This implies that nutrition educators must assume the responsibility to develop, plan and implement educational programs which meets the needs of the community. Thus, educational programs must reflect the best thinking of nutrition educators and be carried out in a systematic and orderly fashion.

Why Plan Programs

There are many reasons for undertaking a systematic planning process, and the following reasons given by Barry Mastrine (1981) are of primary importance.

1. The planning process serves as the foundation on which all organizational activities are based. The planning process therefore results in answering what, why, when, where, and how actions are to be taken and who will conduct the actions. This process is particularly important in programs where everybody is required to participate in the learning process or activities.

2. The primary purpose of planning is to define a course of action that is oriented in results. The planning process sanctions a course of action and assumes that the selected course of action has a reasonable opportunity for success.

3. A plan facilitates the monitoring of whether organizational efforts are being conducted as planned and the evaluation of whether desired results are being met or attained.

4. A well-conceived plan fixes staff responsibilities for implementation. It also provides staff members the opportunity of gaining a clear insight

as to the relationship to their specific work activities to the organization as a whole.

The Planning Process

Program planning begins with assessing and stating the program needs, goes through designing and implementing programs to meet that need, and ends with evaluating the new program to determine to what extent that stated need has been met.

Professional competance is required in setting goals and determining the overall content of a program of education in nutrition (Zeitlin, 1981). These are therefore important responsibilities of the planner or person responsible for developing nutrition education materials.

Planning should be performed in hierarchial manner, starting with broad policies and gradually becoming more specific. There are many steps in program planning depending on type of program and author.

The most important thing in choosing a planning step for adult programs is that the objectives must be reasonable and such that can be attained within a reasonable period of time (FAO, 1982). This is very important because the goals that appear remote or too complicated and unattainable lead to discouragement and loss of interest. Effort is saved and results are more quickly apparent when nutrition education encourages the maintenance of good food habits from the beginning of the program and when priority is given to changing practices which are known to be detrimental to health.

For example, in a community where rice, beans, and fish are staple items in the diet of a majority of the families, and beef is not used due

to cost, families can be encouraged to use beans and shown ways of preparing them for family meals. In this way, nutrition education impacts the knowledge and cultivates the skills that will enable the learner to obtain the best diet possible within existing circumstances.

Steps in Planning

Since there are many or different methods in program planning, only a few of the methods will be mentioned or reviewed. The choice of a method will depend on points mentioned earlier in this report.
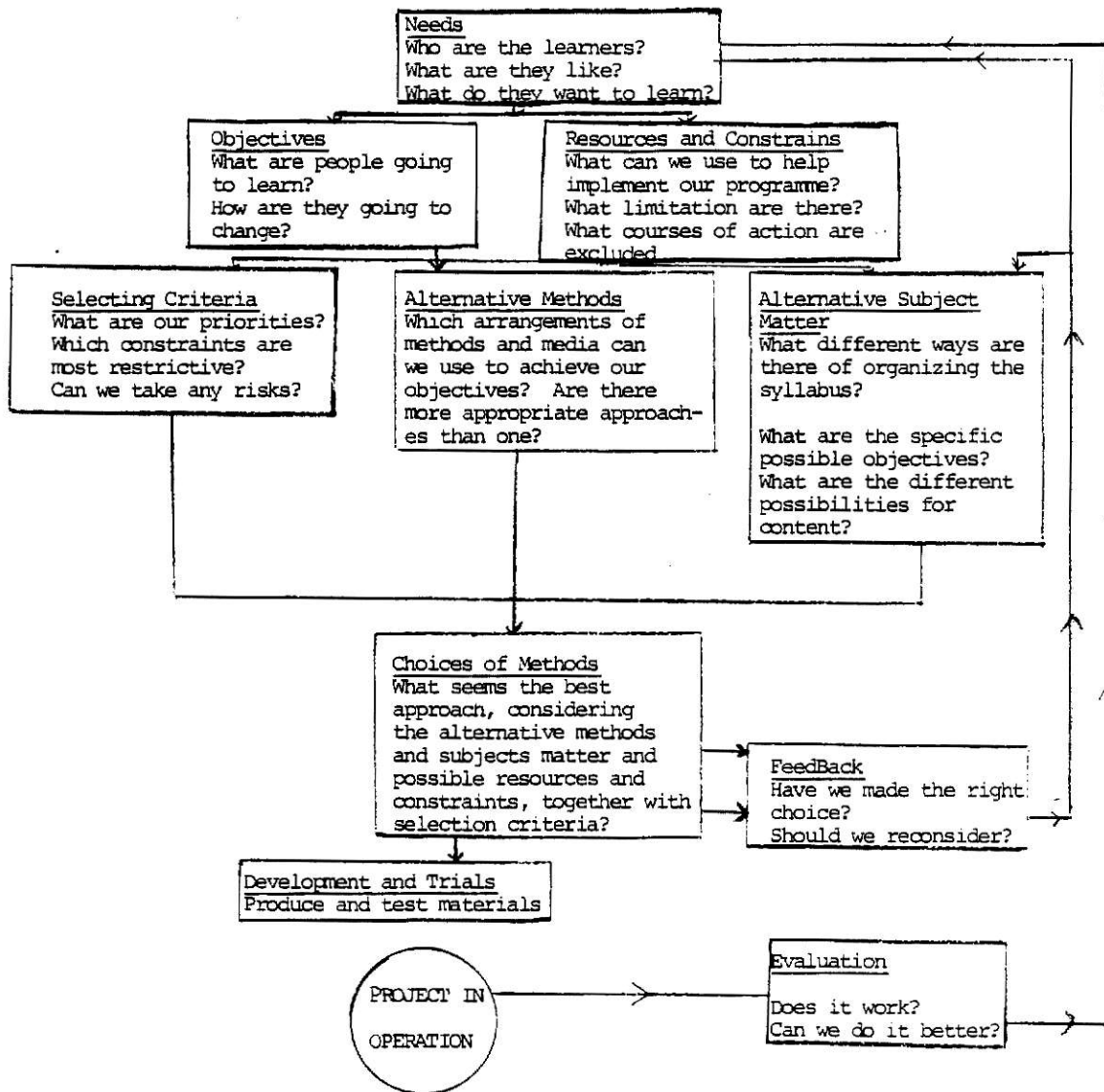
1. One of the methods adopted from Janet Jenkins' illustration can be seen on diagram 2 (The systems approach)

a. <u>Defining needs</u>: The first step is to identify the learners. In this case it may be the family members. This also includes the reason for doing the study. It may be an improvement on an existing program or a totally new concept. The problem may be determined informally or formally by making a needs assessment:

(1) Determining what is presently being done.

(2) Determining what is wanted or intended.

(3) Select or develop data gathering instrument (discussion, interviews, questionaires, etc.)

(4) Collect and organize the information

(5) Analyze data by comparing what is wanted with what is actually available.

Diagram 2

A SYSTEMS APPROACH FOR PLANNING

Needs
Who are the learners?
What are they like?
What do they want to learn?

Objectives
What are people going
to learn?
How are they going to
change?

Resources and Constrains
What can we use to help
implement our programme?
What limitation are there?
What courses of action are
excluded

Selecting Criteria
What are our priorities?
Which constraints are
most restrictive?
Can we take any risks?

Alternative Methods
Which arrangements of
methods and media can
we use to achieve our
objectives? Are there
more appropriate approach-
es than one?

**Alternative Subject
Matter**
What different ways are
there of organizing the
syllabus?

What are the specific
possible objectives?
What are the different
possibilities for
content?

Choices of Methods
What seems the best
approach, considering
the alternative methods
and subjects matter and
possible resources and
constraints, together with
selection criteria?

FeedBack
Have we made the right
choice?
Should we reconsider?

Development and Trials
Produce and test materials

PROJECT IN

OPERATION

Evaluation

Does it work?
Can we do it better?

-38-

b. <u>Defining Objectives</u>: A statement of a project's objectives describes what people will be able to do at the end. This may include young babies, with the intention that they should learn to choose and prepare suitable weaning diets and to identify those foods and modes of preparation that are suitable.

c. <u>Resources and Constraints.</u> This step involves setting priorities and the ways to meet the already set objectives. Some important things to consider include: economics, acceptability of program, resources available and those needed, availability of facilities, equipment and materials.

d. <u>Alternative Methods of Meeting Objectives.</u> There are likely to be a number of possible ways of running the program. For example, campaigns on nutrition could have centrally produced radio programs, posters and booklets, to be used in village groups; or radio programs for exten- sion workers and posters for use with villagers.

e. <u>Alternative Subject Matter.</u> Just as there are many possible ways of running a program, there are also many ways and things to teach or choose from. For example, if it is not possible to teach people about nutrition directly, teaching them about vegetable production may as well solve the problem or convey the same idea intended by the teacher or health worker. This means that a ready made curriculum does not solve all the problems. The teacher must use different topics or different examples to explain certain points.

f. <u>Choice of method.</u> After the program content information has been collected, it must be thoroughly analyzed. Much of the descriptive information can be simply noted in a reporting form. Prepared survey analysis of survey information will provide the planner with

specific instructional tasks and appropriate sequencing for each of
the competencies to be taught. This sequencing will in turn, provide
the planner with a basis for selecting the most effective instructional
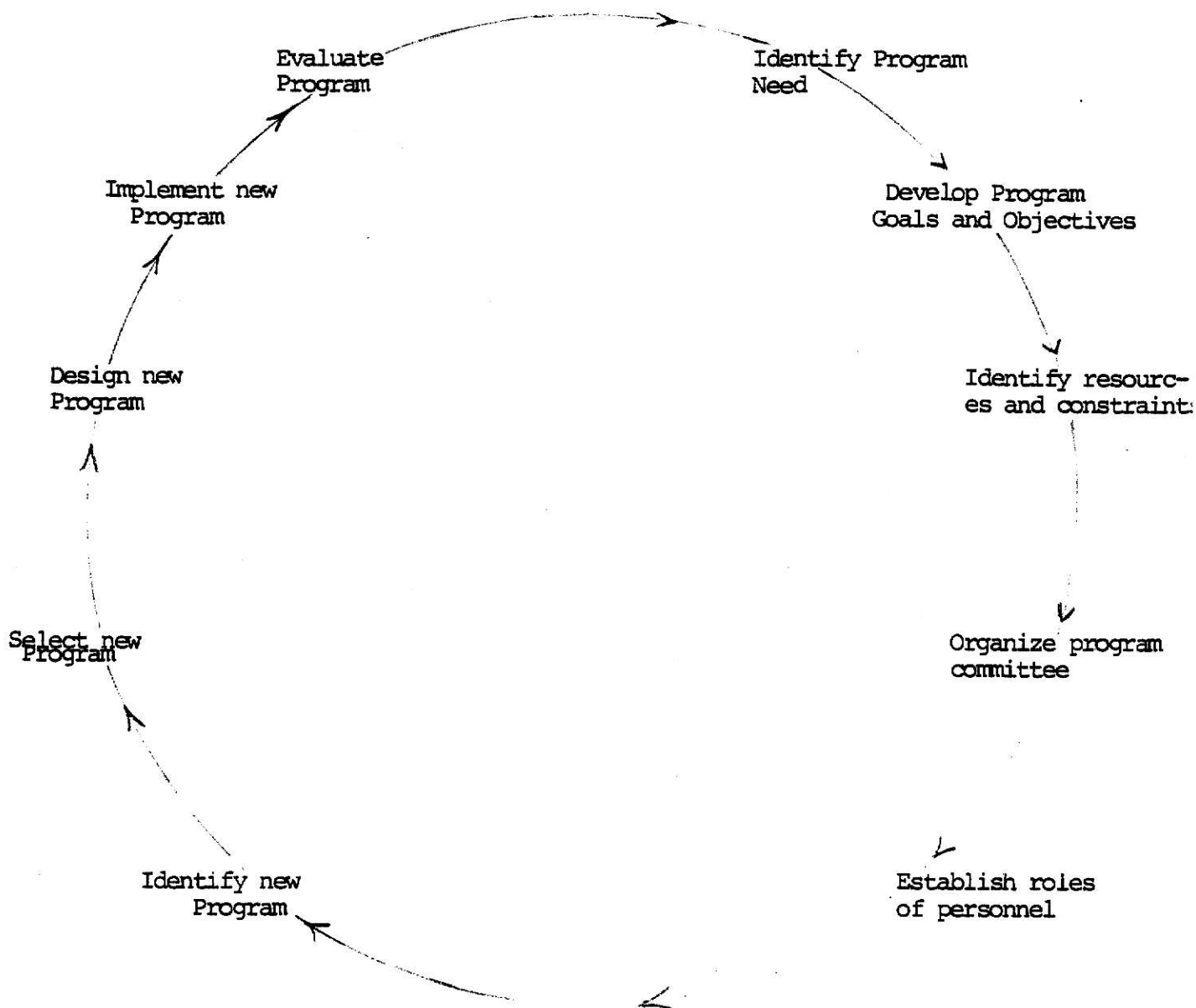method.

g. Development, evaluation and feedback. At this stage, the planning
moves into actual production, with the development, testing and use
of materials. It is possible to find out that decisions made
earlier have to be reconsidered. It is important therefore to be
ready at any stage to modify plans as some new facts come to light.

2. Another method of program planning developed by W. Zenger and S.
Zenger (1981) uses almost the same approach as Janet Jenkins (1981). This is
called a Ten Step Program Planning Process Model. The steps are explained on
the illustration in diagram 3. The authors emphasize that a program may or
may not include all ten steps and may begin or end with any one step in the
process.

Other methods such as the one used by the Food and Agricultural Organization
of the United Nations (1982), has 6 steps which are very similar to the last
2 methods discussed.

   a. Identify the problem.

   b. State what is to be achieved.

   c. Plan program based on resources and constraints

Diagram 3

Evaluate
Program

Identify Program
Need

Implement new
Program

Develop Program
Goals and Objectives

Design new
Program

Identify resourc-
es and constraint:

Select new
Program

Organize program
committee

Identify new
Program

Establish roles
of personnel

Source: Zenger W. F. and Zenger S. K.   Curriculum Planning: A Ten Step Process.
R and E Research Ass. 1982.

d.   Implement the program

e.   Monitor and evaluate the program and

f.   Make program changes as necessary.

Whatever method used in nutrition education, work activities at all
levels, must be carefully planned. It is also important to remember that the
human resources available to undertake and carry through on a program are often
limited. Materials once made cannot easily be changed, and they are useless
if they do not teach. It is for this reason that the planner needs to make
good and reasonable judgement so that time, efforts and resources will not be
wasted.

D. Types and Ways of Teaching and Using Nutrition Education Materials

Most rural traditional communities have well-developed oral art and
entertainment in the forms of stories, songs, proverbs, dance, poetry, and
drama. This provides the teacher with a wide variety of methods to call upon
in helping her students to learn. The teacher, thus is in the position to under-
stand the peculiar characteristics, purposes, advantages and disadvantages of
each method in order to choose the one in each situation that will most
effectively serve the needs of the audience or students. Another important
consideration is how adults learn (conceptual framework for developing materials).
This has been discussed in the first part of this section.

Material for teaching, like literature and audio-visual aids each
has unique characteristics that qualifies it to fill certain specific needs in
the learning process. The nutrition educator needs to be familiar with all

types of materials and their special uses and be able to plan their use in such a way as to exploit their peculiar qualities. Alan Holmes (1968) stated that the educator must find a method of communication, a means of sharing his knowledge with the people in a way they can understand, otherwise he cannot help them. Without communication there can be no education. It is important that a nutrition educator knows how people learn and what influences their learning to be able to select or produce suitable materials to meet those needs.

Choosing a Multi-Media

It is possible to use one teaching medium on its own and get satisfactory results. Each educational medium can teach effectively, if used appropriately. However, teachers are likely to get better results if they use a combination of media. With only one medium, teachers have a greater effort to treat all aspects of a topic effectively. With more than one medium, teachers have a greater effort to treat all aspects of a topic effectively. With more than one medium there is greater choice of teaching methods.

While well-planned use of media helps people to understand and remember better, interpersonal interaction can help long-term memory. An effective way of retaining what has just been learned is to communicate it to someone else, by discussing it informally or in an organized group setting. Discussion groups are therefore an important component of multi-media education.

Teaching is probably easier with more than one medium, as teachers can choose the most suitable medium for each aspect of the subject. A radio series on nutrition education for example, might include recipes and instructions on weaning. However many people would have difficulty in preparing

the meals from an oral description alone. The radio program needs the support
of the recipes which repeats the instructions in a squence of words and
pictures. The teaching contained in the two media may overlap, but different
aspects will come forward in each. Different media are best used to rein-
force each other; usually one medium does most of the teaching while others
act as supplements.

Some of the Materials Used in Teaching

1. Printed Materials.

These materials include billboards, posters, calendars, comic
books, photonovels, leaflets, booklets, flip charts, magazines, direct mail
and product labeling. Printed materials such as posters, signboard and flip
charts are particularly promising in rural areas of developing countries because
of the general scarcity of visual aids. Posters with nutrition messages are well
treasured in rural homes. The most important point about printed materials
is that they should be easy-to-read and not crowded. People are not attracted
to crowded materials because they are confusing.

The most important limitation of printed materials however, is the
fact that many people in rural areas cannot read. Though printed materials
can be used effectively with people who cannot read, they must however be
used with adequate support. Even pictures on their own are often not easily
understood by those who cannot read.

2. Mass Media

There are a number of things in mass communication such as films,
television, radio and newspapers which reach large numbers of people directly
everyday. These can be important aids to communication and teaching nutrition
because they reach so many people at once.

a. Radio - The advantage that radio has over newspaper is that
it can be understood by people who cannot read. It can be used
to convey information about food and can call attention to
problems of malnutrition and get people talking about them.
Also, it can be used to suggest possible solutions and
best ways to achieving them. Although radio is limited to
the spoken word, and cannot demonstrate things usually, it
can present an unexpected wide range of subject matter.

In a multi-media program, radio may be chosen for less formal,
community based aspects of a curriculum. Although radio can
be used effectively for straight forward teaching, it has
the disadvantage of being impermanent. Example, if you miss a
radio program, or fail to understand a point, you have lost
it. Another disadvantage of radio is that it is one-way
means of giving information and cannot be talked back to.
Also, it has the disadvantage of appealing only to the
ears, and does not assist understanding by allowing people
to use their eyes as well. These disadvantages can be over-
come to some extent if radio is used in conjunction with a
good selection of visual aids.

b. Television - most of the points made earlier on radio
also applies to television. The difference is that,
television is audio visual. Television can present things
that are difficult to show in print or describe on radio.

For example, television in nutrition training can give
practical demonstrations on food handling and preparation.
Television may however be too costly if not impossible in
rural areas.

c. Films, slides and filmstrips - Films can be operated
without transmission networks and receivers, but must be
taken to the audience. Where power supplies are lacking,
films can be very effective.

Transparencies may be used to accompany talks, print, sound
tapes or radio. Slides can be used as the basis of a course,
not as accompaniment. They can also be made locally in
black and white or with the supervision of the audio-visual
aid departments of the ministries of agriculture or education.

Cheap to make, reusable, easily changed, easily combined
with print or sound, transparencies deserve greater use
in nonformal education (Jenskin, 1981).

d. Music, dance, and drama - music, dance, and poetry are
traditional media through which people express their ideas
and feelings. Each culture has its own traditional forms.
Drama in West Africa and amongst Mexicans, and festivals
in India are a few examples given by Jenskin. Such enter-
tainments encourage spontanious self-expression amongst the
participants and audience, which can help people clarify
or change their opinions and they reflect local traditions
and culture.

Live entertainments, like drama, get people together, and are helpful in encouraging participation in community development. They can attract a large proportion of the population of any district or local government area.

Methods of Teaching

Teaching or using nutrition education materials should include activities to provide immediate reinforcement of learning, to encourage people to develop their understanding, and to help them relate ideas to their personal experiences. Activities must be arranged to suit the medium. Print is the most flexible, and can include activities of many kinds. With broadcast films, substantial activity must be delayed until after the presentation; since people's memories are limited it is difficult to bring about extensive learning with these media alone. There are therefore advantages in combining media so that they are complimentary. But beyond a certain point learning depends on how the materials are used as well as what is in them.

Methods of teaching include lecture, question and answer, group discussion, laboratory method, project method, demonstrations, apprenticeship, drill, and individual investigation. Each method has unique characteristics that render it peculiarly useful in certain situations and out of place in others. Usually the methods are most effective when used in combination such as a lecture followed by demonstration and followed by question and answer period, and then discussion.

Only some of the popularly used methods will be discussed briefly. This does not mean that the other methods are less important, as said earlier,

it depends on how each method is used or combined with others.

1. The Lecture.

The lecture is so universally used in traditional education that in many minds it is synonymous with teaching. In adult education, however, and even in many formal schools, it is coming to be depended upon less and less as skill is gained in using methods involving a greater degree of student participation.

The lecture is largely a one-way process, from teacher to students. It does not allow for much interaction between students and teacher or among students.

A good lecture should be well organized, with ideas developed in a logical sequence. The lecture should start with the simpler materials and move to the more complex. It should relate to present material to past and future materals.

2. Group Discussion.

This form of teaching is coming to be regarded by leaders in the teaching profession as a basic method of adult education.

Discussion is an effective method for bringing abstract or unknown facts within the scope of our unknown experiences, thereby helping us to make these facts a part of ourselves. Discussion is the process whereby two or more people express, clarify and pool their knowledge, experiences, opinions, and feelings. It is a cooperative process, in which several minds work together on a basis of equality and mutual respect toward either understanding or agreement.

3. Demonstrations.

This consists of the illustration of a process by the teacher, usually in connection with a lecture. Demonstration helps the student to visualize a

process that might be difficult to understand completely from verbal description. If not carefully planned it may have the disadvantage of giving little opportunity for student participation.

4. The Question and Answer.

Somewhat less formal than the lecture, but often used in conjunction with it, the question and answer, or recitation, method allows for interaction between the teacher and the students.
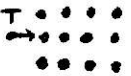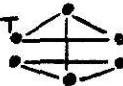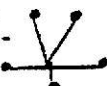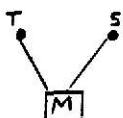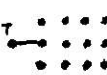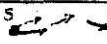
The question and answer method enables the teacher to determine whether or not the students understand the subject matter and whether or not they understand what they are saying. It has the disadvantages of permitting little or no interaction among the students, of possibly being threatening to some students and therefore creating an obstacle to their learning, and of being boring if the recitations merely go over material that is known to most of the people.

Table 2 shows different methods of instructions, major characteristics, interaction pattern, advantages and disadvantages of each method. This table was adopted from Malcolms S. Knowles (Informal Adult Education, 1955), and might help nutrition educators in selecting and combining teaching methods and materials.

METHODS   OF   INSTRUCTIONS

Method	Chief Characteristic	Interaction pattern	Advantages	Disadvantages
1. Lecture	Information-giving		Information is concentrated Good organization of material	Relative passiveness of students
2. Questions and Answers	Questioning by students or Questioning by teachers		Student response	Formality threatening or boring; non-creative
3. Discussuon a. Socratic b. Leader centered c. Group centered	High degree of group interaction		Student participation; interest;use of experience	Looseness of organization
4. Project a. Individual b. Group	Investigation of problems as a whole thru-co- operative effort		Group or individual responsibility; actual experience; interest. Accomplishment.	Wasted effort
5. Laboratory	Working with materials		First-hand experience, Guided practice, Multi-sensory experience.	Time-consuming
6. Apprenticeship	Learning by doing under tutelage		Practical application	Limited to experience of leader
7. Demostration and visual aids	Illustration of processes by teacher		Visualization of process	Limited participation
8. Individual Investigation a. Undirected b. Directed	Trial and errow		Immediacy	Lack of interaction

-50-

EVALUATION OF NUTRITION EDUCATION PROGRAMS AND MATERIALS

Evaluation has been defined as a "process for examining certain objects and events in the light of specified value standards for the purpose of making adoptive decisions" (Mastrine, 1981). This is not the only definition, but different authors have used various descriptions to explain the evaluation process. Whatever definition is used, evaluation is a process of determining the amount of accomplishment of a program. To determine whether a program is a success or failure however, the program must be compared with some kind of acceptable standard of measurement. In describing the need for evaluation of nutrition education programs, Guthrie has stated that we should not promote a class of foods without evidence of its contribution to good nutrition, and that we should not cling to any method of nutrition education unless we have evidence that it brings about desirable habits in food consumption.

Reasons for Evaluation

The reasons for evaluating programs are many and Sims has given the following list.

1. To demonstrate to others that the program is worthwhile

2. To determine whether or not a program is moving in the right direction.

3. To determine whether the needs for which the program is designed are being satisfied.

4. To justify past or projected expenditures.

5. To determine the cost of a program in terms of money or human effort.

6. To obtain evidence that may be helpful in demonstrating to others what is already believed to be true regarding the effectiveness of a program.

7. To gain support for program expansion.

8. To compare different types of programs in terms of their relative effect.

9. To compare different program methods or approaches in terms of effect.

10. To satisfy someone who has demanded evidence of effect.

Apart from proving one's effectiveness in the use of government or other organizational funds, evaluation in nutrition education is important even to the community at the village level. The mothers have to be able to see (through evaluation) the success of the first training program to be willing to give up their time, energy and support to the health educator for a second session. This is because adults always count on their previous experiences in deciding for any type of activity. If a program succeeds at one time, it becomes very easy to get the same people to proceed to another step or start a new project. This is because they have gained confidence in the educator.

Another reason evaluation is important in village extension is that it helps the health workers to plan different programs and to avoid monotony. Without adequate planning and recording for example, it is possible to keep repeating the same lectures or demonstrations to the same audience.

In general, evaluation helps nutrition educators to know how well they are doing, and it may suggest ways of improving their work.

Types of Evaluations

A. Formal Evaluation- This form of evaluation generally includes surveys or extensive monitoring, add statistical skills to intuitive human judgement in order to make it possible to process larger amounts of information.

B. Informal Evaluation - This type of evaluation is one in which a team of experts visit a project, review its account and management, and conduct personal inspections of effectiveness of the program. It is carried out by talking to members of the group in an informal way about a program or education materials.

Some questions that can be answered by the evaluation process are:

1. Appropriateness:

Has the program been directed toward important problems?

2. Adequacy:

How much of the total problem has been addressed by the specific activities of the program.

3. Effectiveness:

To what extent were predetermined program objectives attained as a result of program activities?

4. Efficiency:

How much did it cost in resources to attain objectives.

Steps in Evaluation

Program evaluation is a continuous process and should be done at the beginning, during, and at the completion of a program development. The steps in evaluation include:

1. Specify what is to be evaluated. The first step in any evaluation process is to state exactly what is to be evaluated. That is, is it the whole program or one of the subject areas within the program?

2. Determine criteria to be used to make the evaluation. The evaluator should decide what will be used to determine the worth of that which has been measured.

3. Identify information needed for the evaluation. Make a list of questions posed by this evaluation, then attempt to define the information required to answer these questions.

4. Decide how to collect needed information for the evaluation. Specify where the information will be acquired, who will be involved, and how it will be obtained, whether by survey, interview, etc.

5. Collect and analyze information for the evaluation. Evaluators probably should have a set time table for doing this in order to assure that it is completed.

6. Evaluate information and make decisions. Judge the worth of the program whether it is good, bad, right or wrong.

Types of Evaluations

1. Outcome Studies - These studies pertain to how well and to what extent programs have met their goals and determine if there are any unanticipated outcomes. For example, the program that had as a goal to reduce the prevalence of infant mortality through good nutrition by 40% in 2 years may reduce the prevalence by 20% - that is 50% of its objectives.

2. Impact studies - These are studies that analyze the relationships of a program outcome and activities to the original need and to any related consequences that may be economic, social, political, or clinical. These studies imply a casual relationship between an agency's activities and the social well-being of a community.

3. Cost-analysis studies - This type of study analyzes how program expenditures are allocated. Costs are figures which are derived by examining expenditures of funds according to various criteria deemed to be meaningful.

4. Cost-Benefit Analysis - This study compares the cost of a particular effort with the benefits obtained from it. This type of study attempts to assign monetary value benefits and then divides the figure by the cost.

5. Cost-effective studies - These studies attempt to specify and evaluate social costs and benefits of different programs and services that have basically the same target group and identical pre-defined goals. This is a comparison between two programs that are similiar, to see which one costs more or less.

6. Client Satisfaction studies - This type of study analyzes the opinions, attitudes, and reactions of clients about the program. Discussions, interviews, questionaires and personal visits help educators to tell how a program is meeting the needs of the clients.

Evaluation of Nutrition Education Materials

It is the teacher who is responsible for determining and meeting
the educational needs of the students. It is the teacher who selects her
aids, her resources, her materials and then is accountable for the success
of the program.

Each educational program for adults has some unique characteristics
which must be taken into consideration before any materials are reviewed. A
few of the questions that should be asked about each program are (Holmes, 1968):

1. What is the experiential background of the majority of the
program participants?

2. What are the objectives, immediate and long-range, of the educa-
tional program?

3. What is the background and training of those responsible for
the actual teaching?

4. What are the personal goals, immediate and long-range, of those
enrolled in the program?

The substance of any teaching material, should be viewed with the
following ideas in mind.

a. The topic should discuss adult concerns. The concerns may be
controversial, such as child rearing, religion, or war.

b. The topics discussed should be of current interest.

c. The subject matter should, in some way, contribute to the
    student's ability to cope with his/her environment.

d. The material should not be patronizing, especially when dis-
    cussing a topic which relates closely to the student's social
    situation.

e. Vital, true, and meaningful life styles should be well presented
    in the text. A realistic picture of the life styles of various
    ethnic groups should be incorporated in the subject matter.

The major function of any instructional material is to develop a skill.
The maximum development of these vital skills is a major purpose of adult education.

Skills development, whether in reading or any related subject, should
be sequencial. Learning a skill is a process of "adding on" - extending
what is already known. The sequential development of skills must be done
gradually, but in the shortest possible time, or the adult student will not stay
with the program. Even so, there must be provision in the material for constant
reinforcement of instructional segments previously introduced along with the
new material.

CONCLUSION

It is easier to build good habits than to change poor habits.
The serious problem that exists in relation to nutrition education can be
effectively solved through nutrition education. It is important for nutrition
educators to produce effective materials for nutrition education whether for
non-formal or formal education of adults. Nutrition educators should explore
ways in which the culture of learners differ and design nutrition education
materials that can best suit the different cultures.

Adults unlike children, have a variety of experiences and pre-
conceived ideas which they bring into a learning environment. Learning,
therefore, has to be based on adult's needs and their own perception of those
needs. It is only through nutrition education that communities can be encouraged
to take control of their nutritional resources and living conditions.

There are many theories and methods in adult education, but regardless
of the method used, the underlying factor is interest and motivation on the
part of the learner.

Nonformal education must be organized to take place at times when
those in need can participate in the learning experiences.

To be able to develop effective programs, it is important to understand
that people are the products of their culture. Parental attitudes and kinds
of motivations all contribute tremendously to a child's ability to learn.
This is why the conceptual framework of nutrition education materials is
important in developing good teaching materials.

Just as there are many methods of teaching, so also are there many
steps in developing educational programs. The choice of any method or steps

depends on the complexity and type of program. However, a program must focus on basic problems, such as: defining the needs and objectives of the program, resources and constraints, method of approach and method of evaluation.

Educators must also know the available mediums of transmitting information and know the effects of each medium when several are used together. They must choose functions for each medium and be able to do so using little effort.

As already mentioned, teaching has to fit with learners experience, making use of their existing skills and helping them to acquire new ones.

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THE PROCESS OF DEVELOPING NUTRITION EDUCATION MATERIALS

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ABSTRACT

The nutrition problems existing in most of the developing countries today can be mitigated through good nutrition education. Food habits which have been formed generations ago, contribute to the irrational attitudes of people towards nutrition and other health related programs.

Successful nutrition education in developing countries cannot occur without suitable and relevant teaching materials. However, it is difficult for rural extension workers to find materials that meet the needs of the people with whom they are working. Many nutrition education curriculums are designed to meet the educational needs of nutritionists and extension workers in formal classroom settings or in developed countries.

This report looks at the basic conceptual framework which must be defined prior to developing nutrition education materials relevant to the cognitive development of the target audience. The process of planning nutrition programs and developing materials for adults is discussed. Use of nutrition education materials, with information to guide nutrition educators in combining different teaching methods or selecting suitable methods to meet the needs of different clients is covered as well as methods of evaluating the effects of the programs and materials developed.

The findings and discussions of this report will help nutritionists or health workers, especially in developing countries to produce educational materials that will meet the needs of rural people. It will also help educators to understand the learning problems of adults and to plan programs and materials that will help solve the nutritional problems of rural communities.