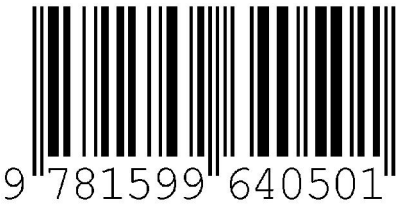
ESSENTIALS OF INSTRUCTIONAL TECHNOLOGY

Mudasir Hamid Malik
Aqueel Ahmad Pandith

ISBN: 1-59964-050-1



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CONTENT

Preface

Teaching is the process which always needs new and innovative principles, rules, techniques, methods and procedure in order to meet the required needs and desires of the learners. Like the technical and technological changes and developments at global level, the teaching also needs to change to meet the desired needs. A teacher has to tackle the challenges and move forward to the future.

In the present work, an attempt has been made to present the material in a simple and lucid language. Where ever need arises examples have been given only to grasp the material fully. It is hoped that the description given here would enable the beginners to grasp the essential concepts easily.

The authors express their grateful thanks to all those sources which have been directly or indirectly in the preparation of this publication. We also wish to put on record, the sincere help and constant encouragement of Mr. Farooq Ahmad (Ph.D. Research Scholar) hroughout the compilation of this work.

The authors are deeply indebted to Marsland Press(U.S.A.) for timely Publication of this book and disseminating the information their-in to the international audience.

Any suggestions for addition or deletion or improvement in any area will be thankfully acknowledged.

AUTHORS

Help us, O` Lord to penetrate into the secret of the child, so that we may know him and serve him according to your laws of justice and following your divine will – Maria Montessori.

The main aim of education is to produce human beings who are able to appreciate the benefits of education and contribute to the development of the community in different spheres of life be it political, social, economic or technological. When we look towards this world from ancient period till today, we find that great transformations had occurred in every period .Vedic system laid stress upon rote memorization or recitation and present system gives stress upon new techniques and methods of education so that we make teaching upto the understanding level of students.

India has set an objective to provide universal, free and compulsory education to its citizens. To achieve this objective our country knocks the door of every one kilometer. In order to recruit teachers in new opening schools, some are PG`s, graduates and mostly our rural areas have been covered by 10+2 teachers. This scheme has affected our country in every sphere of life be it political, economic and social. As Indian Education commission (1964-66) has very aptly observed that the future of the nation is shaped in her classrooms. It is the teacher who moulds the most precious material of land viz the pupils in their most crucial period of development in the required shape. The main objective of our country is to produce quantitative material by emphasizing on compulsory education of its citizens and this compulsion of education had vanished our qualitative aspect of education but the future of any nation is determined by 'quality' not quantity. It is the quality of education that determines the level of prosperity, progress and security of the people. The quality of education depends upon the quality of teachers which a nation produces. As secondary Education Commission (1952 -53) remarks that the most important factor in the contemplated educational reconstruction is teacher his- personal qualities, his educational qualification, his professional training and the place he occupies in the community. The reputation of the school and its influence on the life of community invariably depends on the kind of teacher working in it. The quality of teachers in turn depends upon the training they have themselves received, which ultimately calls for enriching academic and professional preparation of the teachers. This is not only improving the level of knowledge and competence of teacher, but deliberate efforts are to be taken to inculcate in them the positive attitude towards their profession. The Education Commission(1964-66) further remarks us that of all the different factors which influence the quality of education and its contribution to national development, the quality, competence and character of teachers are undoubtedly the most significant. Nothing is more important than securing a sufficient supply of high quality recruits to the teaching profession providing them with the best possible profession , preparation and creating satisfactory condition of work in which they can be fully effective. As Henry Won Dyke has said about teachers and teaching, "Ah! There you have the worst paid and the best rewarded of vocations. Do not enter it unless you love it. For the vast majority of men and women it has no promise of wealth and fame, but they to whom it is dear for its own sake and among the nobility of mankind. I sign the praise of the known teacher, king of himself and leader of the mankind." A teacher has to play a variety of roles during the course of his carrier. He may act as a democrat who promotes democratic value, a detective who detects student's offenses to guide them, an ego- supporter who develops student`s self – concept, an equalizer of educational opportunities, a guide, a friend, a facilitator of earning, a judge to evaluate students, an initiator of new technology of teaching – learning, an inspirer, moral educator, reformer, secularist, socialist and above all an upholder of human values. These functions are discharged by creating a conducive, creative, inspiring, purposeful and favorable classroom environment. Every effort and every progress of a nation depends on the quality of teachers which it produces. A good teacher will always try to remain abreast of the latest information about his respective school subjects. He should be a subject specialist and not general one. He is the yardstick who measures the achievements and aspirations of the nation. The worth and potentialities of a country gets evaluated in and through the work of the teacher. Manu said, "A teacher is the image of Brahma", like God had created the different creatures and have bestowed them respective shapes, same is the role of teacher who can modify his material according to the demands of the society by understanding the psychological basis of individual students. He has to act as a model for students as well as for the whole nation. His personality, character, behavior, mannerism, punctuality, fair and just, healthy and energetic and above all humanism should act as model for the whole citizens of a nation because the people of a country are the enlarged replica of their teacher.

Teaching as a profession requires mastermind creativity in order to devise new methods and techniques to make learning upto the understanding levels of students. A teacher has to face a normal classroom where different categories of learners are available having different psychological needs. A good teacher always tries to motivate the every learner in his classroom by using different techniques and skills. According to Secondary Education Commission (1952-54), "every teacher and educationist of experience knows that even the best curriculum and the most perfect syllabus remains dead unless quickened into life by the right method of teaching and the right kind of teachers". This commission has emphasized us that even if we have a best curriculum available, it will not bring any

revolution in teaching – learning process unless we have not available right methods of teaching and qualitiative teachers.

CONCEPT OF TEACHING

Teaching is a social process on which the political system, social philosophy, values and culture of every nation leave their impression. The word 'teaching' is derived from 'to teach' which means to instruct. It means a process in which one individual makes something known to another individual. According to B.O Smith, "Teaching is a system of actions intended to produce learning."

Meaning of teaching in political system:-

1. **Meaning in autocracy:-** In this system of teaching, the primary place is given to teacher and pupils have secondary importance. Here the teacher considers himself as an ideal, imparts knowledge according to his own will and remains active as compared to pupils. Pupils remain just silent spectators and have no right to interact in any way. H. C. Morrison`s view supports this system.
2. **Meaning in Democracy:-** In this system of teaching, the pupils are given primary place and the teacher secondary. There occurs an independent interaction between the teacher and the students. N.L. Gage`s view supports this system.
3. **Meaning in Laissez-faire**:- In this system of teaching the teacher is like a friend. Here the teacher provides opportunities to the students for solving their problems. He does not interfere in their activities. Brubacher`s view supports this system of teaching.

Definitions:-

i. **Morrison :-**"Teaching is an intimate contact between a more mature personality and a less mature one which is designed to further the education of the later."
ii. **N.L. Gage:-** "Teaching is a form of inter-personal influence aimed at changing the behavior potential of another person."
iii. **John Brubacher :-** "Teaching is an arrangement and manipulation of a situation in which there are gaps and obstructions which an individual will seek to overcome and from which he will learn in the course of doing so."

iv. **John Dewey:-** "Teaching is a system of action involving an agent, an end in view and a situation including two sets of factors-those over which the agent has no control (class size, size of classroom, physical characteristics of pupils etc.) and those that he can modify such as ways of asking question about instructions and ways of structuring information or ideas gleaned."
v. **Edmont Amodhon:-** "Teaching is an interactive process, primarily involving classroom talk which takes place between teacher and pupil and occurs during certain definable activities."
vi. **Clarke:-** "Teaching refers to activities that are designed and performed to produce change in student behavior."
vii. **Thomas Green:-** "Teaching is the task of teacher which is performed for the development of a child."
viii. **Yoakum and Simson:- "**Teaching is the means where by the experienced members of the group guide the immature and infant members in their adjustment of life."

From the above definitions, it can be concluded that teaching has multi-meanings. According to John Adam, teaching is a bipolar process, i.e, its one pole is teacher and another is the pupil. Like education, teaching has narrow and broader meanings. In narrow meaning, teaching means to impart knowledge and counselling to the pupils in the classroom. But in broader sense, every person or an object goes on teaching one or the other thing to the pupil right from birth till death. In other words, the mutual exchange or relationship between teacher, pupil and society or curriculum which arises the curiosity of learning in the pupils is teaching. The broader meaning of teaching was supported by John Dewey by saying that teaching is a tripolar process i.e, it consists of teacher, pupil and society or curriculam. It is a professional activity which requires experience, maturity and subject matter specialization. It is an interactive process involving an independent interaction between the teacher and the pupil. It gives freedom to all the participants to discuss any subject matter and make a critical analysis of the subject matter. It is an activity which helps the learners or pupils to bring desired changes or modifications in their behaviours.

CHARACTERISTICS OF TEACHING

If we have to describe a thing, we mainly through light on its attributes and from these attributes we fully understand that thing. Same is the case with teaching, if we have to understand what teaching is, we have to through light on its various attributes. The main characteristics of teaching are as:

1. **Teaching is an interactive process**:- One of the main characteristics of good teaching is that it should be interactive process. It is with the help of this interaction, that the learners too become active in any learning process. We attain and achieve specific purposes and objectives that may be the academic growth of the learner, his physical improvement and making him economically sound so that he may resists and exist well in the present conditions of life due to the blessings of proper interaction.
2. **Teaching is both formal and informal:** Another characteristic feature of teaching is that it may occur formally or informally. Formal means where we have an organized system with a definite purpose. It is planned, systematic, definite and deliberate. Informal system means where we have no organized system and it is unplanned, unsystematic, incidental and indefinite. For example in the classroom, the teacher and the students meet in a formal way and teaching takes place. Outside the classroom also, the teacher and the students meet where teaching does take place that is informal teaching. Both formal and informal ways helps us in achieving the desired goals. Thus these ways of teachings form another character of teaching.
3. **Teaching is both art as well science:-** Teaching is both art as well as science as silverman 1966 explains it in these words, "To be sure – teaching like the practice of medicine – is very much an art, which is to say, it calls for exercise of talent and creativity. But like medicine, it is also a science, for it involves a repertoire of techniques, procedures and skills that can be systematically studied, described and improved. A good teacher, like a great doctor is one who adds creativity and inspiration to the basic repertoire."

Teaching is not everybody`s cup of tea. It is an art which is favourite of the selected few. As Rabinder Nath Tagore has said, "Teacher can never teach unless he is learning himself," so it is the profession which requires blood, sweat and tears. For those it is not profession but a mission and have craze for it.

4. **Teaching is not one – sided:-** Any teaching whether formal or informal in which only the teacher remains active and learners simply silent spectators is not good teaching at all. As we have learned in autocratic system of teaching, the teacher is the only leader of the group. No one can criticize him even if he disseminates wrong information. He only remains active and students indulge in dry – dreaming. This type of teaching is not good because it does not give any opportunity to a learner to show his capacities, capabilities, interests etc. and the result comes out to be unsatisfactory i,e; all in vain. The main feature of good teaching is that in it both the teacher and the learner have to be fully active, face to face with each other and this interaction makes teaching learning process an effective and successful one.
5. **Teaching is not an independent activity:-** Man is a social animal. He cannot survive in vacuum. He had to establish relationships with other members of his society in order to survive, to fulfill his needs etc. Teaching too is a social process. It takes place in some social setup, where the teacher aims at improving the behavior of the individual or some social group. Good teaching always prepares the individuals to become cultured, socially acceptable, morally, intellectually, physically fit in order to render good service to whole humanity. In this process of all round growth and development of the social beings, the teacher also comes out to be a far better individual with his knowledge updated and enriched.
6. **Teaching is a planned activity:** Good teaching is well planned and well prepared activity. It is organized in a systematic way. Before teaching takes place, a teacher prepares and plans his lesson in advance. He collects all information from different sources like books, journals, references etc. in order to make his teaching a successful one. A lot of thinking is done on it in advance once teaching is started by the teacher in the classroom. He thinks of different methods, audio – visual aids, charts, maps etc. in order to make his teaching more and more effective. When he plans the lesson in advance, the teaching then goes on systematically and smoothly.
7. **Teaching is diagnostic and Remedial:** Good teaching is diagnostic and remedial in the sense that the teacher first knows exactly the abilities, capacities and interests of his pupils. He knows the individual differences of the learners in order to select suitable teaching materials, methods, audio – visual aids, academic environment to be involved in the teaching process. He uses the diagnostic technique in order to know the difficulties and problems of learners and then accordingly he suggests suitable remedial measures in order to remedy those difficulties.
8. **Teaching is dominated by communication skills:-** Good teaching depends on the communication, the better the communication, the better is the process of teaching. The learners of any class will receive anything from

the sender, if they will be in a position to understand that. For example, if a teacher is teaching to class III in Kashmir, if he uses the English language in order to disseminate information, the pupils will not gain anything because they do not understand the said language and should use mother tongue as medium of instructions.

9. **Teaching is worthy of analysis and interpretation:-** Good teaching can be observed, analyzed and assessed. The analysis and assessment may provide essential feed – back for bringing desirable improvement in the process of teaching. The improvement can be brought about in the teacher, in the learner or in the teaching – learning process. For example a new innovation in teacher – training programmes viz microteaching is a technique through which we observe, analyze and asses the teachers and their teaching through different skills and prepares them to become good and effective teachers.
10. **Good teaching is democratic:-** Good teaching is always democratic in its attitude. It attempts to create a democratic environment in which every individual is respected in all matters. In this environment, every individual is entitled to equal rights with every other individual in the class and that he is subject to the same rules with respect to social equality as other pupil. No one is discriminated on the basis of caste, colour, creed or religion, everyone is given equal status according to good teaching.
11. **Teaching causes motivation:-** The activity of teaching causes motivation that results into learning, for example when pupil – teachers go for teaching – practice, it is the teaching which motivates those pupil – teachers in order to plan their lessons and during this planning, they themselves learn more and more about that content.
12. **Teaching is professional in character:-** Teaching is an activity which is carried on by the professionals. Every activity requires a person who is professional. For example in medicine, a carpenter will not come out as successful because he had no knowledge of that specific field viz medical profession. It requires those who had already received training in this field. Same is the case with teaching profession. It demands those persons who are skilled and have gone through different teacher – training courses. This activity involves the teacher and the learner and as a result of it, there occurs development of both teachers and students.

FUNCTIONS OF TEACHING

Before we will discuss the functions of teaching, we will understand first variables of teaching. All those factors and situations upon which teaching process depends are called the teaching variables. The main teaching variables include the dependent, independent and intervening variables.

The factors which undergo a change in behavior during the process of teaching are dependent variables. It is the student and his behavior which shows modifications from time to time. The modification in the student and his behavior is brought about by the teaching process. How much a student's behavior changes depends largely upon the nature of teaching and the efforts of the teacher. He has to perform such activities and show that type of behavior as the teacher wishes from time to time. It means that the student has to play a dependent role in this process because he has to follow the path show by the teacher and to adopt himself to the teaching of the teacher. The teacher in this process holds an independent position because it is he who plans and changes everything, keeping everything under his domain viz both the student and the intervening variables. Besides the teacher and the student, all those factors or situations which play their role in the teaching learning process viz the curriculum, methods and techniques, audio–visual aids are called as intervening variables. Though they are lifeless in nature, but it is the medium that makes the connection possible between the dependent and independent variable. It helps them to perform their respective functions. As for as the functions of teaching variables or teacher is concerned, they can be divided into the following three types:

i) **Diagnostic functions:-** The main function of teacher is not only to teach and disseminate information to the learners but diagnose his students in order to render best help to them. He has to diagnose his students from every angle, i.e, to know their physical, emotional, intellectual capabilities and weaknesses, to know different kind of teaching methods and techniques, teaching materials and teaching aids etc. Not only these he has to know himself, about his abilities and capacities and whether am I in that position to diagnose the learners correctly or not. It means he has not only to diagnose learners but himself too.

ii) **Prescriptive Functions:-** when the teacher rightly diagnoses his learners, he had now to perform the prescriptive function. It means he has to prescribe prescriptions according to their individual differences or learning problems. He had to prescribe the subject matter, methods and techniques, teaching skills and feed – back devices taking into consideration their abilities, intersests, capacities and available resources.

iii) **Evaluative functions:-** After prescription, the teacher performs now evaluative function. Different evaluation techniques are used for the evaluation of teaching – learning process like observation,

interview, written, oral and practical tests. Through these evaluation techniques whole teaching – learning process is evaluated interms of success or failure. If the aims and objectives set by the teacher have been achieved, it means the teacher had rightly performed diagnostic and prescriptive functions. If through evaluations, it is learnt that the aims and objectives of teaching have not been achieved it should be ascertained as to where the fault lies. It may lie in the wrong use of diagnostic or prescriptive functions. This evaluation technique is useful for both the teacher and the student. The teacher comes to know whether there is any need of changing the nature of his prescriptive functions and teaching methods and the students come to know about the benefit they have derived from the teaching – learning process because the teacher changes everything in order render to best help to the pupils. Now we will discuss below the functions of teaching:-

a. **Explain and inform:-** The main function of teaching is to explain and inform the students about a topic`s pros and cons. A good teacher is expected to be well informed especially in the area he teaches. He should have the ability to give the background, motivate, explain technical terms and relationship of the topic with other subjects and with our present life. For example if a teacher teaches the 'dynasty of Mughals', he should be capable to give the background, should motivate the students by using story telling or dramatization method and its importance in our present life.It means teaching explains and informs us about all the dimensions of a content.
b. **Initiation, direction and administration:-**It is the function of teaching to initiate, direct, organize and take decisions about any problem which arises in our school or with our teaching – learning process. It is the good teaching through which a student handles difficult situations and gives possible suggestions about those for example; a student is misbehaving in the classroom. It is the function of the teaching to take initiative against this misbehaving problem. It has to see whether it is genetic problem or environmental and accordingly it had to direct him and solves his problem.
c. **Giving security: -** Teaching performs the function of giving security to the children interms of praise, reinforcement, friendly atmosphere etc. As we have seen many children in our classroom or school who always remains isolated from other classmates. It is the function of teaching to find out those children, to find out their problems, what is the reason behind their isolation or rejection from other classmates and suggest possible solutions in order to bring again life in those students by giving them every kind to assistance.
d. **Evaluating, recording and reporting:-** Evaluation is must for students progress. A teacher comes to know about his teaching whether he had secceded or not by means of evaluation. It is the function of teaching to use suitable evaluation techniques in order to check the progress of both pupils as well as of himself. If students shows progress in studies, it means both have secceded in their respective missions. It is the function of teaching to record, report and then evaluate the progress of students in order to dispatch it to their parents as well as to principal of that institute so that modifications may occur among them.
e. **Diagnosing learning problems:-** Teaching also performs the function of diagnosis. There are children in every classroom who do not make expected progress in their studies, growth and development. The teacher must diagnose their learning problems and should suggest the possible course of action.
f. **Enriching Community Activity:-** It is a said fact that school is a miniature society. Teaching should enrich the community activities because it is the community who had to pay for it. The teacher should remain in close contact with the community in which he serves. Better relations generate a conducive environment in this miniature society. Hence it is the function of teaching to develop mutual relations between all those agencies which are related with this miniature society.
g. **Arranging and organizing classroom:-** It is the function of teaching to arrange and organize the classroom materials in a better way. Physical facilities should be appropriately provided in the classroom and should be arranged and organized in an attractive way so that pupils take more interest in their studies. The arrangement of these facilities should be flexible whenever the situation demands.
h. **Making curriculum materials:-** In our country, the curriculum is framed at the state level for the entire state without caring for local needs and conditions. For example, if we went to a far flung area, their language development is not so much strong as of urban pupils. The curriculum framers while framing it take into consideration only their children in whom already have development of language taken place. Today, if we look towards the science or English of 7^{th} standard of Kashmir division, it is not suitable for those pupil residing in far- flung areas due to the use of complex language. So it is the function of teacher and teaching to modify the curriculum according to the local needs of the community.

i. **Adjusting to his environment:-** Modern age is the age of science and technology. It had served as well as created a lot of troubles and tension to an individual. A child should be provided such environmental conditions with which he will adjust himself to the changing conditions of modern society.

j. **Emotional Stability:-** An adolescent is highly emotional and wants to express them. We know that unguided expression of emotions leads to wilderness and destruction. It is the function of teaching to guide him in order to bring stability of his emotions so that it will not lead to destruction .

k. **Prescriptive function:-** It means that in the process of teaching the teacher has to prescribe certain things for the learners. Through diagnosis he knows their abilities, capabilities, interests and on the basis of this information he can prescribe new techniques and methods which are according to their individual differences. The suitable contents and different strategies are also frammed out to make the teaching easy and also to attain the goals.

PHASES OF TEACHING (JACKSON)

Teaching is a quite complex process designed in a social setup. Therefore, in order to make it a successful mission and upto the understandable level of students, we have to design it in such a way so that it becomes an effective one. It has to be done in systematic steps. The different steps constituting the process are called the phases or operations or stages of teaching. Jackson divides the teaching into three stages or phases as:-

1. Pre – active or planning phase.
2. Interactive or implementation phase.
3. Post active or evaluative phase.

Now we will discuss these steps one by one as:-

A Pre – active Phase:- It is also called as planning stage or phase of teaching. The whole planning regarding the lesson is carried out in this phase. It includes all those activities which a teacher performs before classroom teaching in order to make his lesson more easy and effective. At this stage, he plans the lesson, how a lesson should be introduced,how to motivate the learners, which method and technique should be used, different audio-usual materials too are taken into consideration. The whole planning is done only to make the learning material easy and understandable so that he will come out as a successful teacher.The following activities are included in this stage of teaching.

a. **Formulation of the objectives:-** At first, the teacher determines (formulates) the teaching objectives which he has to achieve in the form of behavioral changes of the students. These objectives serve as an instrument through which he brings change in the students' entering behavior. He divides these objectives into two types viz entering behavior of the students and terminal behavior of the students.

b. **Decision making about the subject content:-** When the teacher fixes the objectives, he makes decision about the content which he has to present before the pupils and through that he wants to brings change in their behaviors. When the teacher selects the content for presentation before students, he keeps in mind the following points.

1) Need of the curriculum prescribed for the students.
2) The entering behavior of the students.
3) The terminal behavior of the students.
4) Level of motivation that will be effective for the students.
5) Different methods and techniques suitable to content.

c. **Sequencing of content for presentation:-** When the teacher chooses the content which he has to present before students, then he arranges the content in to logical and psychological sequence so that after learning the content they should be able to transfer it or in other words whatever they will gain, it should assist them in transfer of learning or training, for example learning of mathematics helps learners in solving numerical problems in physics.

d. **Decision about strategies of teaching:-** After the teacher makes a logical and psychological sequence of the content material he now decides about the suitable teaching methods, proper strategies and tactics in order to make the content easy and reachable upto their brains. He selects the different methods and strategies keeping in view the level of students and objectives of teaching.

e. **Distribution of teaching strategies:-** After the teacher has decided about the different strategies and tactics for presenting the content to the students is not sufficient. But he has also to decide how and when he will make use of these strategies during the classroom teaching. For example if the teacher has to

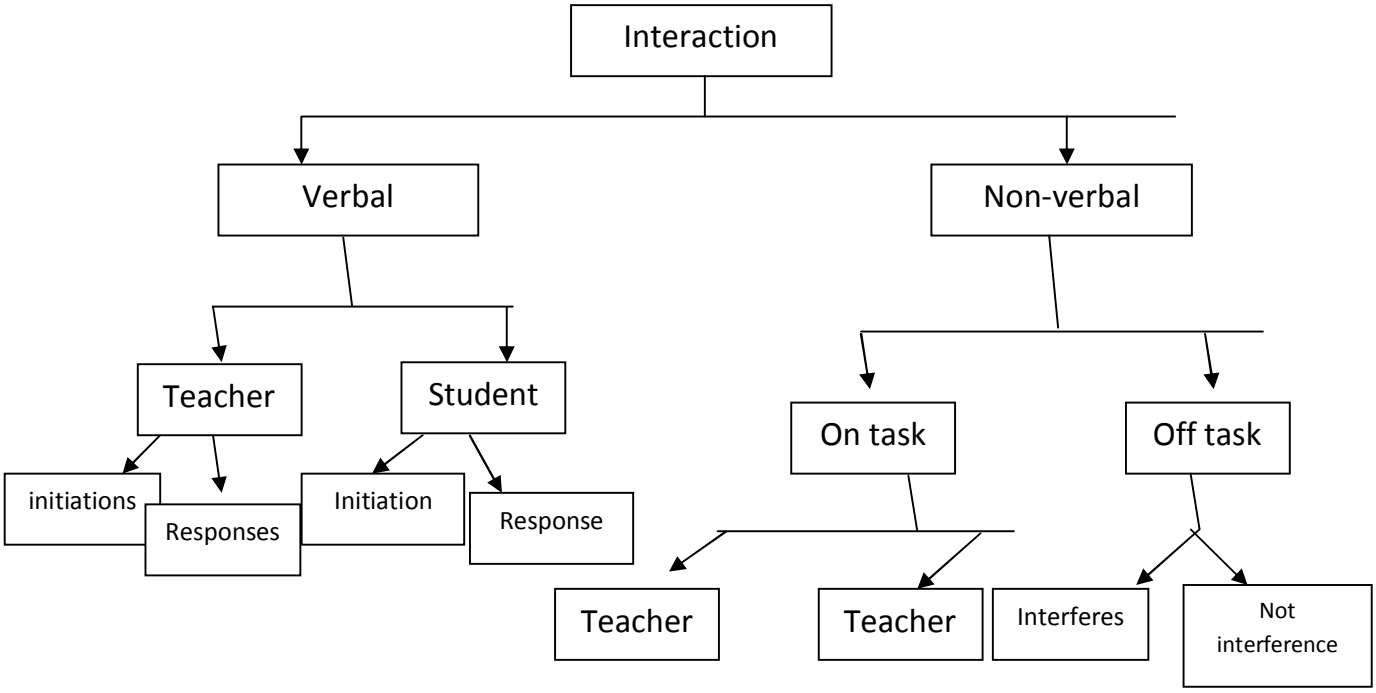
present before the students the content "functions of heart", he has to decide when and where I will show themodel of heart, it different parts and how they function.

B. Interactive Phase:- In this phase, all those activities which a teacher carries over right from entering the classroom till the presentation of the content are included under this phase. It is the implementation of pre-active phase of teaching. Pre-active stage acts as its base where everything is planned so that during presentation he may come out as successful one. According to P. Jackson, "The teacher provides pupils verbal stimulation of various kinds, make explanations, ask questions, listens to students' responses and provides guidance." It is the stage of explanations of technical terms, removing of doubts and gaining of new information. The following activities are included in the inter active phase of teaching:-

f. **Sizing up of the class:-** After planning the whole lesson, the teacher now enters into the classroom, as he enters he perceives the size of the class. He does this activity in a few minutes. He analyses the chemistry of whole classroom. He comes to know the pupils who can help him in his teaching and those who can create a problem for him. In the same way, the pupils perceives the personality of the teacher in a moment. Hence, the teacher should possess all those qualities which are necessary for this profession.

g. **Diagnosis of learners:-** When the teacher perceives the class size, he immediately checks the worth of pupils by means of different techniques. He tries to diagnose the achievement levels of pupils by assessing their abilities, aptitudes, interests and academic background.

h. **Action and reaction (Achievement):-** After diagnosing the learners, the teacher initiates his content to present before the students. As soon as he presents the content material, two types of activities occurs in this process viz, initiation and response. Both these activities occur between the teacher and the students. Both verbal and non-verbal interaction occurs during this sub-stage. In other words, when the teacher performs some activities, the pupils react to those actions or when pupils perform some activities the teacher reacts to those activities and thus the interaction goes on in the teaching – learning process, for example when a teacher starts delivering his lecture, he initiates the process and when students respond either in the form of questions which arise in the form of doubts or in the form of technical terms not explained in the form of response, creates an interaction in the classroom. We can present this interaction of the teaching by the following diagram:-



The teacher performs the following activities in order to analyze the nature of verbal and non –verbal activities of this interaction.

1: **Selection of Stimuli:-** The presentation of new knowledge before the students is the motto of teaching. The presentation of new knowledge acts as stimuli and can be verbal or non-verbal. The teacher should present those stimuli which will be effective to create desirable situations for the teaching process and control the undesirable stimuli only for effectiveness of this process.

2: **Presentation of Stimuli:-** When he selects the stimuli for presentation before the students, he should present those one`s which will create an interest among learners towards learning. During such presentation of stimuli, he keep in mind that how these stimuli should be presented so that proper motivation may be provided to them, should be relevant for objectives and should be presented in logical and psychological sequence so that proper rapport develops between teacher and pupils. In other words, he has to keep in mind the form, context and order of the stimuli.

3: **Reinforcement:-** When the teacher present the stimuli (content materials) in the form of verbal and non- verbal cues, he has to use that mechanism through which the students rate of responding increases or he has to use reinforcement. Reinforcement is a condition which increases the possibility of occurrence of a particular response. It is two types viz, positive and negative reinforcement. Teacher sometimes uses positive and sometimes negative reinforcement in order to strengthen their rate of responding, modifying or correcting the response.

4: **Deployment of strategies:-** At the time of interaction which goes on between the teacher and the pupils, the teacher produces such activities and conditions by the reinforcement strategies which affect the activities of the pupils. As soon as the teaching process starts, he uses verbal and non- verbal behaviors so that the content should be impressive and effective. In the deployment of the teaching strategies, three areas should be considered viz presentation of subject matter, levels of learning and level of learners, so that proper interaction occurs between them.

C. **Post – active or Evaluation phase:-** As the inter-active stage of teaching sums up, the teacher now checks whether the presentation of content takes the form of success and effectiveness. He checks the effectiveness by means of different techniques like asking some question verbally or in written form. He measures their behaviors whether a change had occurred in their terminal behavior. He evaluates them to check whether the said objectives formulated at planning stage have been achieved or not. Thus evaluation stage includes all those activities which can evaluate the achievements of the pupils and attainment. It includes the following activities.

i. **Defining the exact dimensions of changes caused by teaching:-**

As the teaching task sums up, he now tries to see the changes occurred in the behavior of the learners through teaching. He defines exactly the changes that occurred in the dimensions of behavior which is called criterion behavior. He compares the entering behavior of pupils with the terminating behavior. If he notices that the desired changes had occurred in the behavior of maximum number of students, he concludes that the different teaching strategies and tactics have worked effectively with the help of which teaching objectives have been achieved.

ii. Selecting appropriate testing devices and techniques:- The teacher selects the different testing devices and techniques in order to measure the behavioral changes of the students. He selects those techniques which are reliable and valid.

iii. Changing the strategies interms of evidence gathered:- The teacher gathers evidence in support of different techniques, instructional procedures, methods and the strategies used during inter-active phase of teaching. These evidence serves as a best tool to know whether modifications have occurred in the students behavior and how successfully the objectives have been achieved. These evidences not only checks the progress of students but also of teacher whether he diagnosed the learners correctly or he has to bring changes in the different strategies and tactics.

PRINCIPLES OF TEACHING

The profession of teaching is not so easy as we have understood it. It needs blood, sweat and tears to make it a successful one. It demands experts or subject specialists to taught a subject. While teaching, he keeps in mind the aims and objectives of subject, learners individual differences, the different methods and techniques suitable to a content and the environmental factors into consideration. The different stages of teaching alone will not help a teacher to make his lesson successful but he needs the help of different principles of teaching. These principles assists a teacher to motivate the learners to make teaching effective. Some principles have evolved on the basis of experience, researches and general traditions while others have evolved on the basis of psychological makeup of the individual. These principles help the teacher to carry on his routine of teaching efficiently. These principles have been divided into two types viz, general principle and psychological principles keeping in view their evolution and the suitability to different conditions of teaching.

A): General Principles:- The general principles of teaching also called as main principles have evolved from traditions, general experience and researches. These principles helps a teacher to remain on the right track and provides him guidelines to carry on it successfully. Some of the general principles of teaching are as under:-

i**. Principle of definiteness of goals or objectives:-** An individual after passing matriculation examination sets his definite goals on the basis of the stream he chooses, whether arts, medical or non-medical stream. By fixing the set goals or objectives he achieves the excellence in the respective fields which he chooses, same is the case with the profession of teaching. A teacher should first fix up his goals or objectives related to the definite subject he teaches. Without definiteness, he may go astry and his teaching may lack coherence. He selects every kind of material and methods on the basis of definite objectives. Without definiteness of objectives, the teaching does not remain a purposeful activity and the learners too may deviate from the normal path. Objectives vary from subject to subject and from time to time. For example; the main objectives of teaching languages are listening, reading, writing and speaking. Behind teaching science, the main objective is to develop scientific temper and awareness about different facts among the learners.

ii. **Principle of planning: -** Behind every success lies the proper planning. A student preparing for entrance examinations makes good planning in order to achieve the desired goals. An author before writing a book makes good plans in order to complete his work successfully. Same is the case with the teaching profession. A teacher should always plan his lesson before delivering it. He becomes successful and his teaching becomes efficient because of planning. Success or failure of teaching depends upon planning. Planning involves selection, division and revision of the content. The teaching materials should be carefully selected keeping in view the teacher's ability and students individual differences. After selection of the material, he should divide it into meaningful units on the basis of logical and psychological sequence. After division, revision helps the teacher to test the understanding of his pupils. Revision should take place at each stage or at the end of the lesson.

iii. **Principle of activity (learning by doing):-** when a teacher explains a content in terms of lecture, most students remain absent minded only after 10 -15 minutes and this results into wastage of time and energy of both the teacher and pupils. The learning which takes place through self-activities becomes more effective, vivid and remains in long –term memory. The learning of any material to retain for long time depends upon the learner's involvement in that content. The learning process becomes easy and quicker when learners involve their heads and hands together. This principle may be applied at all the stages in the school. Learning by doing removes dullness and prepares an individual psychologically to recieve any information, for example the project method always keeps the learners busy in their work, where they fully involve themselves in their projects. Dalton plan can also be made for securing the active participation of students in their work.

iv. Principle of individual differences: - When a teacher teaches his well planned and well prepared lesson in a normal classroom, he expects that all learners will learn. But when he applies the technique of evalution in order to check their achievements, some pupils shows progress while others remains backward. The teacher gets confused that why every learner has not shown the positive results. The main reason lies behind it the individual differences of the learners. Every learner differs from another one in interests, aptitudes, abilities, achievements, aims, aspirations and intelligence etc. The teacher while teaching the whole group of students by using one method and using only one language fails in his mission. A good teacher always keeps in mind the principle of individual differences and tries to satisfy every learner by using different methods and strategies of teaching.

v. **Principle of correlation (linking with actual life and other subjects):-** Teaching does not mean only to provide information about the different subjects but its aim should be to make the life of children happy and successful. Whatever the teacher teaches them that should be related with their actual life situations directly or indirectly. The knowledge gained by them in one subject should help them in solving the real life problems or should apply that in other subjects. Hence whatever they achieve in one field should be correlated with other fields, for example learning

of mathematics should help them in solving the numerical problems of physics or chemistry. Learning of philosophy should help them in understanding the psychology of children. The concept of banking can be taught by arranging a visit to a local bank. They will understand the concepts of savings, credit and how it plays an important role in social setup of a country by removing ill- doings of people by providing them financial support.. So a teacher should keep in mind this principle while teaching any content.

vi. Principle of democracy:- One of the main motto of our educational system is to provide equal opportunities of education to all sections of the society Whether Hindu, Muslim, black or white, low status or high status, lower castes or upper castes etc. Our teachers mostly have been corrupted in this matter. They give more attention towards those children whose status is high interms of economy social social status of their parents. But the successful teaching occurs in such environment where everyone is treated on equal grounds. No discrimination is made on the basis of caste, colour, creed, status etc. He should treat all the students like his family members whose religion, caste, status is equal and no one is discriminated in that family which adopts humanistic values. So a teacher should keep in view the principle of democracy while teaching any group of students.

viii. Principle of model Representation: - We have seen that the learners imitate the teacher`s personality, dress style, actions etc,. A teacher should be a model in his behavior which affects the personality of the child. Through his behavior, he should reflect the regularity, punctuality, honesty, truthfulness, sincerity etc, and then only he will be able to make his learners reach the goals of ideal life.

viii**. Principle of Progressiveness: -** Every person is endowed with some basic attitudes, interests, ideals, information, skills, abilities, instincts, desires, sentiments, etc. A good teacher is concerned with the progress of children in the all round development of his personality. He always progresses in his teaching interms of different strategies regarding teaching. The different strategies helps a teacher to make improvement in his teaching. When teaching improves, it is progressive.

B): Psychological Principles: - As the name implies, these principles have evolved by taking into account the psychological makeup of the child. Some of the main psychological principles of teaching are given below:-

I. Principle of motivation or interest: - The success of teaching – learning process mainly depends upon the motivation or interest of both teacher and learners towards the content material. It is the instrument which creates interests among learners in order to make the teaching – learning process an effective and fruitful activity. It is the food which energies mind to perform different activities. Unless the learners are not motivated or will not show interest towards the content material, all efforts will go in vain because it is the learners who has to grasp the material. Everything becomes purposeful when interests are aroused among learners. Children feel motivated for the things which are connected with their natural urge or activity. They love play and activity. For example combination of H_2 + ½ O_2 $\longrightarrow$ H_2O, the pupil feels boredom and will not show interest towards it. But if a teacher performs the same experiment in a laboratory and shows how they react to form water, the learners will show interest towards further learning. The principle of motivation or interest rejects the autocratic teaching in a democratic system.

ii. Principle of repetition and exercise: - Long term memory mainly depends upon the repetition of the learned material. A teacher at the pre-active stage of teaching divides his content material into meaningful units on the basis of logical and psychological foundations. A teacher should repeat several times what he teaches in the class so that the learners are able to grasp and understand the subject matter well. When teacher repeats the material, it retains for a long time in the pupils mind. It was Thorndike who put experimental evidences in favour of utility of repetition and exercises in the learning process by formulating different laws of learning. A teacher who makes use of exercise like revision, recapitulation, application of what has been taught to the students etc., can teach the students efficiently. A teacher may use this principle by giving home assignments to the students. For example when a teacher shows the numerical of physics, after that teacher gives them homework to exercise it at home. With this exercise, they gain mastery over the problem.

III Principle of feedback and reinforcement: - The skill of reinforcement plays an important role in the success of teaching – learning process. A teacher while teaching should make use of reinforcement in order to make teaching more effective. The knowledge of results should be given to learners because weak learners knows their drawbacks and they relearn the material. Through feedback the teacher weighs himself as well as learners. For example suppose during teaching there arises a question in the mind of pupil regarding the topic and he poses it to teacher. It is the duty of the teacher to encourage those students and not to discourage. Teacher should apply the positive reinforcement so that he may further think about the quires which arise in his mind. In spite of this, if the teacher discourages him, his power of thinking will stop automatically. So a teacher should make use of principle of reinforcement during his teaching.

IV Principle of Variety:- Principle of variety brings life in the classroom environment. A teacher who always teaches by using same method and same language does not achieve success in his profession. He should not use same method of teaching always. For teaching, different methods at different times may be used. Suppose the teacher

is teaching social science, he should not always use dramatization or narration method. Instead of dramatization he should take them to outside classrooms in real social setups. For example the teacher wants to test the students' of learning of the material, he should use different techniques like oral, written tests, etc.

V Principle of fostering creativity:- Whenever there have been oral tests, it has been observed that the teachers check their cramming power and not the ability of creativity. Cramming power hinders the creativity power of an individual. Those pupil who satisfy their teachers by means of cramming gets positive reinforcement in the form of praise, grades, medals, awards etc. but the future of a nation depends on creative persons not on crammers. So a teacher should encourage the creative pupils. In facts the best teaching is one which always fosters the creativity among the learners.

VII Principle of sympathy and kindness:- The congenial environment in a classroom can be created by means of kindness and sympathetic attitude. It has been observed that the children love those people who shows kindness and sympathy towards to them. Scolding, nagging and rebuking like terms develop hatred among students towards the teacher. He should always show sympathy towards interests and needs of the students. He should respect their feelings. The teacher should show his sympathy and kindness towards those pupil who remain isolated and rejected in the school.

VIII Principle of recreation:- It has been observed that when a teacher talks like a machine continuously in the classroom without any recreation or entertainment, it's results comes out in negative. The students attention diverts after 10 or 15 minutes, so by means of recreation he may catch their attention gain towards the topic. Recreation removes the dullness of the classroom. Any type of fatigue caused by continuous learning is ended by it. It makes teaching more effective.

IX Principle of providing training to senses:- Senses plays a very important role in the teaching – learning process. It has been said that sense are the gateways of knowledge. It is the duty of teacher to provide proper training to their senses. Different capabilities and abilities shown by a person is the result of proper usage of senses. An individual observes, experiments, identifies, discriminates and generalizes on the basis of proper functioning of these senses. About 90% of learning is based on the sense of sight and hear and remaining 10% on smell, taste and touch. Field trips, outgoing, picnics help the learners in seeing things and thus getting first hand information which is more vivid and provides first hand experiences to the individuals to the senses .thus good teaching always keeps in view the principle of providing training to the senses of individuals.

MAXIMS OF TEACHING

Every teacher wants to make maximum involvement and participation of the learners in the learning process. He sets the classroom in such a way so that it becomes attractive for them. He uses different methods, rules, principles etc in order to make his lesson effective and purposeful. He uses general rule or formula and applies it to particular example in order to make teaching – learning process easy and upto the understandable level of students. These settled principles, tenets, working rules or general truths through which teaching becomes interesting, easy and effective are called the maxims of teaching. They have universal significance. Every person who is expected to enter into the teaching profession have to familiarize himself with the maxims of teaching. Their knowledge helps him to proceed systematically.

The different maxims of teaching are briefly explained below. The teacher should always proceed keeping them in view.

1. **From known to unknown:-** When a child enters into school, he possess some knowledge and it is the duty of teacher to enlarge his previous knowledge . Whatever he possesses should be linked with the new knowledge. If we link new knowledge with the old knowledge our teaching becomes clearer and more definite. This maxim facilitates the learning process and economses the efforts of the teacher and the taught. For example is teaching English to the children and he is to teach the word 'water'. He reminds them the Kashmiri word 'Aab' which they already know and then tells them that in English we say 'water'. This way of teaching helps the learners to understand things fully. This way the teaching becomes definite, clearer and more fruitful.
2. **From simple to complex:-** The main objective of teaching is to teacher and the learners objective is to learn something. In this process of teaching and learning, simple or easy things should be first presented to the students and gradually he should proceed towards complex or difficult things. The presentation of simple material makes the learners interested, confident and feel encouraged. As they will show interest towards the simple material, they becomes receptive to the complex matter. On the other hand, if complex matter is presented first, the learner becomes upset, feel bored and finds himself in a challenging situation. For example in mathematics we first present the idea of +, - , x and then division. When the child gets admitted to 9^{th} and 10^{th} class we introduce

algebra, surds, trigonometry, geometry etc. As he proceeds further he becomes familiar with the complex material like matrices, integration, differentiation etc. In this way a learner shows interest by proceeding from simple mathematics to complex one. But if we reverse the situation, he will find himself in a challenging situation and will left his studies due to complexity of matter. Simplicity or complexity of the subject matter should be determined according to the view point of the learners. It somethenes teaching being done by the teacher and makes learning convenient and interesting for the students.

3. **From concrete to abstract:-** Concrete things are solid things and they can be visualized but abstract things are only imaginative things. The child understands more easily when taught through their senses and never forget that material. On the other hand if abstract things or ideas are presented, they forget it soon. As Froebel said, "Our lessons ought to start in the concrete and end in the abstract". For example when we teach the solar system, we first visualize the sun through our senses and gives the concept of eight planets, galaxies, meteorites etc. Through this process, the learners understand the materials more easily. Some power of imagination also develops in them .But if we reverse the situation, it will become difficult for learners to understand anything. Another example, when we teach counting to the students we should first take the help of concrete objects like beads, stones etc. and then proceed to digits and numbers.
4. **From analysis to synthesis:-** When we divide a thing into easy parts or separate elements in order to understand it easily is called analysis. It is the process which helps in understanding the hidden elements of a thing or the cause of some incident or behavior. For instance, in order to tell about the structure or functions of heart, the parts of the heart are shown separately and knowledge of every part is given. After it the students are made to understand the structure or system of working of the heart. In this way, even a very difficult thing can be easily understood. Synthesis is just opposite of analysis. All parts are shown as a whole. The process of analysis is easier than synthesis for understanding a thing. This process develops the analytical power of the students. It is the best method of starting the teaching process.For example while teaching digestive system, we should first analyse the different parts of digestive system one by one and then gives the synthetic view of it. Hence a good teacher always proceeds from analysis to synthesis.
5. **From particular to general:-** Suppose a teacher is teaching mathematics, he may ask the students to find out the value of $(8\text{-}5)^2$, $(10 - 8)^2$ etc. by simple multiplication. Then only he should make the generalization that $(1^{st}\text{ term} - 2^{nd}\text{ term})^2 = (1^{st}\text{ term})^2 + (2^{nd}\text{ term})^2 - 2\ 1^{st}\text{ term x II term}$ or $(a\text{-}b)^2 = a^2 + b^2 - 2ab$. By teaching first particular cases and then make generalization makes the teaching-learning process more easy and purposeful. A teacher should always proceed from particular to general statements. General facts, principles and ideas are difficult to understand and hence the teacher should always first present particular things and then lead to general things. Suppose the teacher is teaching continuous tense while teaching English, he should first of all give few examples and then on the basis of those make them generalize that this tense is used to denote an action that is going on at the time of speaking. Hence a teacher should proceed from particular to general.
6. **From empirical to rational:-** Empirical knowledge is that which is based on observation and firsthand experience about which no reasoning is needed at all. It is concrete, particular and simple. We can feel and experience it. On the other hand rational knowledge is based upon arguments and explanations. For example suppose the students are to be taught that water boils on heating. They should first be made to heat the water and see it boiling. Then the teacher should explain that when water is heated, the molecules gain kinetic energy and there is thermal agitation of the molecules which make the water boil. This maxim is an extension of some of the previous maxims, namely proceed from simple to complex proceed from concrete to abstract and from particular to general.
7. **From induction to deduction:-** The process of deriving general laws, rules or formulae from particular examples is called induction. In it if a statement is true in a special situation, it will also be true in other similar situations. It means drawing a conclusion from set of examples. For example when hydrogen reacts with boron, it gives Boron hydride, potassium reacts hydrogen, it gives potassium hydride, we come to the conclusion that all elements when reacts with hydrogen they from hydrides. While using this process in teaching, a teacher has to present particular examples or experiences and tell about similarity of their attributes. Deduction is just opposite of induction. In it, we derive a certain particular conclusion from general laws, rules or principles. For example in language teaching, before giving the definition of noun, the students are acquainted with the example of noun like man, chair, Delhi etc and then they are led to general definition of noun. So a good teacher always proceeds from induction and finishes at deduction.
8. **From psychological to logical:-** Modern education gives more emphases on psychology of the child. The child`s psychological development is of utmost important than any other thing. A teacher while teaching should follow this maxim viz from psychological to logical. Psychological approach takes into consideration the pupil his interests, abilities, aptitudes, development level, needs and reactions. The teacher should keep in mind the

psychological selection of the subject matter to be presented before the pupils. Logical approach considers the arrangement of the choosen content into logical order and steps. It is child centered maximum. For example a teacher tells the story of a poem to students when they are not interested in reading, with this a teacher proceeds from psychological to logical sequence.

9. From Actual to Representative:

First hand experiences makes learning more vivid and efficient than to give them representative ones. A teacher while selecting the content for presentation should make all efforts possible to present it through actual, natural or real objects than from their improvised representative one's like pictures, models etc. For example to teach about 'Golden Temple Amritsar', a teacher should try his best to visit the actual place and that learning will be more vivid and the pupils will retain it for a long time inspite of teaching through sketches, model or a picture. Representative forms should be used at the higher classes than in lower classes.

10. From Whole to Parts:

This maxim is the offshoot of gestalt theory of learning whose main emphasis was to perceive things or objects as whole and not in the form of parts. Whole is more understandable, motivating and effective than the parts. In teaching, the teacher should first give a synoptic view of lesson and then analyze it into different parts. For example the teacher while teaching the pollination in plants, he should first take the flower then analyze it into different parts and give detailed information about each and every part like the sepals, petals, androceium, gynoceium etc. In this way, maximum learning is possible. It is actually the reverse of the maxim "analyses to synthesis".

11. From definite to indefinite:

A teacher should always start from definite because definiteness has its limited boundaries and jurisdiction than indefinite things. We always have confidence on definite and tested things. We learn easily indefinite things on the basis of definite things. Hence a teacher while teaching any content should first present definite things, ideas and then he can learn indefinite things easily. Definite things, definite rules of grammar help the learner to have good knowledge. Gradually he can be taught about indefinite things.

MODELS OF TEACHING

Before knowing the meaning of the phrase 'Models of Teaching', it is essential to know the meaning of the word model. The term model has been interpreted in different ways. We use the word model in our everyday life in many ways. For example when we see the 'model of golden temple Amritsar', it seems to us just like real golden temple even if it is a very small thing. Hence the small shape of anything is called model. These types of models usually serve our teaching learning process. In a classroom, the teacher becomes a model for a child, who is copied in every aspect of his personality. A model is an exact replica of the original thing. When an artist wants to construct a bridge or when a builder wants to construct a building, he brings before himself a small picture or a model of the thing and creates or builds that thing with the help of that model.

The different meanings of the term model as described above may prove quite helpful in understanding or defining the term 'model of teaching'. It has been defined by the research workers and writers in a number of ways. Some of these definitions are given below:

1. *Joyce and Weil (1972):* They have given three meanings:
   - *i.* "Teaching models are just instructional designs. They describe the process of specifying and producing particular environmental situations which cause the students to interact in such a way that specific change occurs in his behaviour."
   - *ii.* *Joyce and Weil (1972):* "Teaching model is a pattern or plan which can be used to shape a curriculum or course, to select instructional materials and to guide a teacher's actions."
   - *iii.* *Weil and Joyce (1978):* "A model of teaching consists of guidelines for designing educational activities and environments. It specifies ways of teaching and learning that are intended to achieve certain kinds of goals."
2. *N.K.Jangira and Azit Singh (1983):* "A model of teaching is a set of inter-related components arranged in a sequence which provides guidelines to realize specific goal. It helps in designing instructional activities and environmental facilities, carrying out of these activities and realization of the stipulated objectives."
3. *Paul D.Eggen et. al (1979):* "Models are prescriptive teaching strategies designed to accomplish particular instructional goals".

In conclusion, teaching models may be described as some sort of guidelines, plans, techniques or strategies designed to achieve specific educational objectives. They differ from general teaching objectives in the sense that they are designed to meet specific objectives or goals.

Types of Teaching Models:

Every teaching model has its specific objective. In order to achieve the objective of a teaching model, the teacher has to choose right type of model for achieving the particular objective. The teaching models have been classified into three main types:

1. *Philosophical teaching models*: Israel Saffer had mentioned such types of models. These include 1. The Insight Model (Plato). 2. The Impression Model of Teaching (John Locke).
2. *Psychological model of teaching:* John P. Dececco had mentioned such types of models. It includes 1. A Basic Teaching Model (Robert Glaser) 2. An Interaction Model of Teaching (N.A. Flander).
3. *Modern teaching models:* Bruce R.Joyce has divided all the teaching models under the title "Modern teaching models" in the following four categories:

a. *Social interaction model:* The social aspects of human beings are kept in view and their social development is more emphasized. It includes 1. Social Inquiry Model (Byron, Mossilas and Cox). 2. Group Investigation Model (Herbert, Thelen and John Dewey) 3. Classroom Meeting Model (William Glaser).
b. *Information processing models:* The models of this type are concerned with the intellectual development of the individual and help to develop the method of processing information from the environment. It includes 1. Concept Attainment Model (J. Bruner) 2. Advance Organizer Model (David P. Ausubel) 3. Inductive Thinking Model (Hilda Taba).
c. *Personal development models*: These types of models help an individual to develop fully in the environment. It includes 1. Synectic model (William J. Gordon) 2. Non-Directive Teaching Model (Carl R. Rogers) 3. Awareness Training Model (David Hunt).
d. *Behavioral modification model*: These models are related with the behavior modification theories. It includes 1. Training Model 2. Stress Reduction Model 3. Assertiveness Training.

Fundamental elements of a teaching model:

1. *Focus:* Every teaching model differs from another in terms of its objectives. It is the nucleus of a teaching model. Every model is developed by keeping in view its focal point or objective. For example the focus of concept attainment model is to develop inductive reasoning among students.
2. *Syntax:* It means the detailed description of the model in action. In it, the teaching activities and interactions between a pupil and the teacher are determined in such a pattern or in a sequence that the teaching objectives are achieved conveniently by producing desirable situations.
3. *Principle of reaction:* This element is concerned with the teacher's reaction to the students responses. In it, he comes to know that how he has to react to the responses of the students and has to see whether the learners have been actively involved in the process, or not.
4. *Social System:* This element is concerned with the activities of pupil and the teacher and their mutual relationships are discussed. Every teaching model has separate objectives and will have therefore separate social systems. For example in one model, the teacher plays a role of a democratic one, he guides, directs and plans co-operatively with students.
5. *Support system:* It means the additional requirements beyond the usual human skill, capacities and technical facilities. In it, the evaluation is done by oral or written examination, whether the teaching objectives have been achieved or not.
6. *Application:* It is an important element of a teaching model. It means the utility or usage of the learnt material in other situations.

CONCEPT ATTAINMENT MODEL

The concept attainment model belongs to the category of information processing models. It was developed in 1956 by Bruner, Goodnow and Austin. Their work, A Study of Thinking, culminated many years of research into the process by which people acquire concepts. It begins with the assertion that human beings have a capacity to discriminate and to categorize things in different groups on the basis of their similarities and dissimilarities. This categorization reduces the complexity of the environment. It is used to teach concepts to the students. For example

on the basis of similarity and dissimilarity of attributes of chemical elements, they have been categorized into metals, non-metals, halogens, noble gases etc due to the characters which have differentiated them in order to attain the different concepts like metal, non-metal, halogens etc. On the basis of their study, three models of concept attainment have been built viz. reception, selection and unorganized model. Each one has a slightly different syntax, but all have been developed from a common conceptual base. The main elements of the concept attainment model are as:

i. ***Focus:*** The main focus of this model to develop inductive reasoning of the students. A number of examples are presented before the students in order to draw the general conclusion to form a particular concept.

ii. ***Syntax:*** The whole interaction process which takes place between the teacher, curriculum and the students occurs during the syntax phase. As the teacher enters into the classroom, he gives detailed information to the students about the different activities that will go on during their attainment of concept. He gives them all types of instructions that how you will perform different activities in order to gain the concept. After that the teacher says, I have a concept in my mind you have to guess about it. He presents data in the form of examples (Yes and No type) before the students. For example; Apple-Yes; Onion-No. As the teacher has done an action, the students have now to react to these examples by forming different hypotheses or guesses according to their mental level. Some students guess that the concept is about five letter words, some about vitamin 'A', some about the fruits etc. As the students guessed about different concepts, now the teacher reacts to their responses in the form of more examples instead of that they have not achieved the concept at simplest level, if not achieved he gives further example like Banana-Yes. Now he compares their hypotheses with this example, only two hypotheses viz. vitamin 'A' and fruits stands confirmed and those whose hypotheses have been rejected do not think further. Again he gives example like orange - yes, again it is compared with the hypotheses and now only one stands confirmed i.e., fruits and the students achieve concept by means of their attributes. When they have got the concept, they practise it by giving more examples.

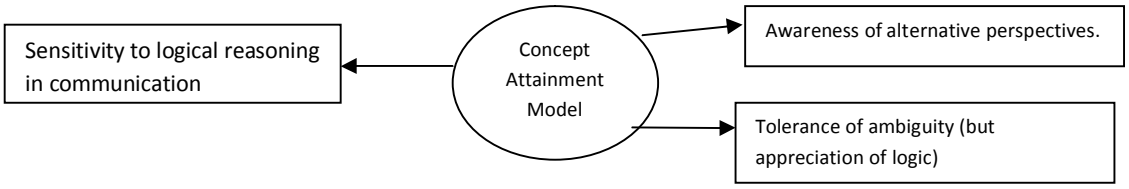
iii. *Principle of Reaction:* During the interaction between the teacher and the students, the teacher reacts to their every hypotheses in a creative and supportive manner. He tells them to test their hypotheses against the further example which a teacher presents after their guesses. He encourages not only those students whose hypotheses is confirmed but also to those whose hypotheses stands rejected. In this way, a teacher becomes a supportive one to the whole class. As he gives further and further examples his wish is to develop analytical power of the students. Whatever ideas arise from the students mind, he encourages them by explaining the merits of all their hypotheses.

iv. *Social System:* Proper interaction occurs between the teacher and the students during this process. As the teacher selects a particular concept, organizes it into positive and negative examples and sequences the examples, he supplies them additional examples whenever the need arises. He records their hypotheses, provides hints to them and presents additional data in order to attain the concept fully. So in this model, the social system of the classroom is moderately structured. A proper interaction occurs there which makes it socially efficient.

v. *Support System:* The data or content material should be designed in such a way so that the students may easily attain the concepts. It stresses upon to attain concepts and not to invent concepts. The data should be presented in discrete units: Yes or No type and these should directly help the students to form some hypotheses in their minds. When the teacher presents an example before the students, they describe its attributes, which can then be recorded in a column on a blackboard or flash-cards. Thus the teacher should see that his procedure, the aids etc. really become a solid support for the model.

vi. *Application:* This model serves as an evaluation tool to determine whether the learners have mastered the previously learned ideas or concepts. The different concepts like democracy, socialism, capitalism which otherwise are difficult for the learners become easy. The basic concepts of mathematics, social science, science and languages can be effectively taught by this model. It can be used with all ages and grade levels. The curriculum of lower classes mainly consists of concrete concepts and it serves a best tool to attain concepts at lower level with the help of concrete material.

vii. *Instructional Effects:* Different instructional goals are achieved according to particular concepts.



It gives practice them in inductive reasoning and opportunities for improving students concept-building strategies.

Varieties of concept attainment model:-

There are three variations or models of concept attainment and each has a slightly different set of activities (Syntax) and all other elements are common to them.

Syntax of reception model:-

Syntax of reception model is divided into three phases and they are as:

1. *Presentation of data and identification of concept:* Teacher presents labeled examples, students compare attributes in positive, negative examples. They generate and test hypotheses. They state a definition according to the essential attributes.
2. *Testing attainment of concept:* Students identify additional unlabeled examples as Yes or No. teacher confirms hypotheses, names concept and restates definition according to essential attributes. Students generate examples.
3. *Analysis of thinking strategy:* Students describe thoughts, they discuss role of hypotheses and attributes. They discuss type and number of hypotheses.

Illustration: If our topic is "Fruits". The task may be carried out as:

1. In the beginning the teacher will present two examples (one positive and one negative) of the concept, written in the following way:
   Apple: Yes.
   Onion: No.
2. The students are asked to think of the possible categories into which the positive example 'Apple' can fit in.
3. The students form some hypotheses, they are asked to write down the hypotheses:
   i. The teacher wants to teach about five letter words.
   ii. The teacher wants to teach about Vitamin 'A'.
   iii. The teacher wants to teach about different colours.
   iv. The teacher wants to teach about fruits.
4. An additional example (positive) will be presented by the teacher. Let it be as: Banana: Yes.
5. Students will be asked to test their hypotheses in the light of new example. It will result in the rejection of the hypotheses (i) and (iii).
6. The teacher again presents the example like: Orange: Yes.
7. This example may cause the elimination of the hypotheses (ii). Therefore, they attain the concept of fruits.

Syntax of the Selection Model:

It has been divided into three phases:

i. ***Presentation of Data and Identification of Attributes:*** Teacher presents unlabelled examples. Students inquire which examples, including their own, are positive ones. They generate and test hypotheses.
ii. ***Testing Attainment of the Concept:*** Students identify additional unlabelled examples. They generate examples, teacher confirms hypotheses; names concepts restates definition according to essential attributes.
iii. ***Analysis of Thinking Strategy:*** Students describe thoughts, discuss role of hypotheses and attributes. They discuss type and number of hypotheses.

(3). ***Syntax of Unorganized Model:***

It has been divided into two phases:

i. ***Description of Concept as it is Used:*** Locate and label concept. Identify attributes being used.

ii. ***Evaluation of Concept:*** Discuss adequacy and appropriateness of concepts being used. Compare examples to other data using same concept.

Illustration of unorganized model:

Let us illustrate the use of unorganized materials model by teaching the concept, "Vegetables with edible roots". The task may be carried out as under:

a. The teacher may begin by presenting the two labeled examples as below:
   Carrot: Yes; Wheat: No.
b. It may lead the students to suggest the following hypotheses (the same will be written on the black-board).

a. Orange coloured vegetables.
b. Vegetables that are eaten raw.
c. Vegetables with edible roots.
d. Vegetables rich in vitamin 'A'.

c. The students will be persuaded to provide suitable examples for testing the formulated hypotheses. The process may be summarized as below:

Student	Teacher	Inference
Raddish	Yes	Hypotheses (a) & (d) are rejected.
Potato	Yes	Hypotheses (b) is rejected.

(4). The students are left with only one hypotheses i.e., vegetables with edible roots. They will be persuaded to search for more examples for the confirmation of the hypotheses like turnip, Onion etc.

(5). The students with the help of all positive examples will be persuaded to list out all the attributes of the concept and distinguished it from other concepts as understood through negative examples. It will help them to attain the concept "vegetables with edible roots".

MEANING AND ADVANTAGES OF AUDIO- VISUAL AIDS

Effectiveness of teaching – learning process does not depend only on teacher but also upon the different types of equipments available in the classroom. The different equipments generally called audio- visual aids makes teaching – learning process more interesting, more stimulating, more reinforcing and more effective. According to Indian Education Commission (1964 – 66), "the supply of teaching aids to every school is essential for the improvement of the quality of teaching. It should indeed bring about an educational revolution in the country." These are those instructional devices which are used in the classroom to encourage learning and thereby make it easier and interesting. Albert Duret rightly said, "it is easier to believe what you see than what you hear, but if you both see and hear, then you can understand more readily and retain more lastingly." They are called so because they call upon both the auditory and visual senses of the learners.

Definitions:-

i. **Carter V. Good:-** "Audio – visual aids are those aids which help in completing the triangular process of learning i.e; motivation, classification and stimulation."
ii. **Edger Dale:- "**Audio – visual aids are those devices by the use of which communication of ideas between persons and groups in various teaching and training situations is helped. These are also termed as multisensory materials."
iii. **Burton:-** "Audio – visual aids are those sensory objects or images which initiate or stimulate and reinforce learning."
iv. **Mcknown and Roberts:-** " Audio – visual aids are supplementary devices by which the teacher, through the utilization of more than one sensory channels keeps to clarify, establish and correlate concepts, interpretations and appreciations."
v. S.P. Ahluwalia:- "Audio – visual materials reinforce the spoken or the written words with concrete images and provide rich perceptual experiences which are basis of learning. These material make learning less non-verbalistic and reduce the boredom of mere verbalism."

Thus audio – visual aids are those instructional devices which makes teaching – learning process more interesting and effective. They use multi – sensory organs like hearing, seeing in order to make the process more vivid and impressionable. It reduces the rate of verbalism by providing content material in the form of concrete forms.

Advantages:-

National Policy on Education (1986) has recommended the use of teaching aids, especially improvised aids to make teaching – learning more effective, durable and realistic. They have great educational value from the point of view of teachers as well as of students. The following points highlight the need, importance and advantages of audio – visual aids in the teaching – learning process.

1. Audio – visual aids helps in the maximum utilization of sense organs in the teaching – learning process. According to Gandhiji, "True education of the intellect can only come through a proper exercise and training of bodily, organs – hands, feet, eyes, ears and nose." The use of sense – organs in any process helps us to gain maximum knowledge. Empirical as well as rational knowledge is easily gained by the use of senses.
2. They help us to make teaching – learning process more effective and interesting. The use of different audio – visual aids reduces the passiveness of the classroom interaction and makes it lively and interesting.
3. They help us to recognize and meet the individual requirements of the individuals. Some learn better through demonstration and some learn better through doing. So they recognize the individual differences of the learners.
4. They make the abstract ideas concrete and thus help in making learning more effective. It results into more clarity and better understanding.
5. It reduces the rate of verbalism by providing concrete materials in the form of charts, models, maps etc. It clarifies the abstract concepts by the use of different aids and thus helps us to make things more clear and meaningful to the students.
6. They help us to provide first hand experiences to students. For example it is not possible to bring the object in the class like lion, elephant etc and their pictures or models can be used for teaching purposes at that time. Thus these aids are good substitutes for the real objects as they make learning equally meaningful.
7. They help us to economise the efforts of the teacher and the taught. In other words, they save much time and energy of teacher and taught because very difficult items can be easily taught through their use in a limited effort.
8. They help us to develop creative power of the individuals. By providing the different types of equipments, the learners involves their all faculties in order to create or develop something new.
9. They help us in overcoming the shortage of resources like shortage of good classroom teachers, shortage of current facilities available for teaching and learning.
10. They help us in transfer of learning or training and helps us to develop scientific attitude among the learners.

Types of Audio- Visual Aids:-

The audio – visual aids have been classified in a number of ways according to different approaches, some are as:

1. **Technical Approach:-** They have been classified into two types viz, audio aids and visual aids.
   a. **Audio – aids:-** The aids involving the sense of hearing are called audio – aids e.g; radio, tape-recorder, records player etc.
   b. **Visual aids:-** Those aids which use sense of vision are called as visual aids, e.g; models, pictures, maps, bulletin board, slides, epidiascope, over head projector etc.
2. According to 2nd approach, the audio – visual aids have been classified into two types viz; projected and non- projected teaching aids.
   a. **Projected aids:-** Teaching aids which help in their projection on the screen are called as projected aids. For example, film strips, slides, film projector, overhead projector, epidiascope etc.
   b. **Non –Projected aids:-** Teaching aids which do not help in their projection on the screen are called non-projected teaching aids. For example, chalk board, charts, actual objects, models, taps – recorder, radio etc.

PROJECTED TEACHING AIDS

Projected teaching aids are those aids help in their projection on the screen. When a projected aid is used, an enlarged room is either totally or partially darkened. It includes the following aids.

I. Film:- Motion pictures usually termed as films represent an effective instructional device calling upon auditory as well visual senses of the learners. They are useful and suitable aids in order to cater the students attention and create interest among them towards effective learning. They provide a lot of information to the learners apart from their recreational value. Educational films may be prepared on any content material or any aspect of knowledge, correct attitude and behavior. Usually we have available general educational films, classroom films, basic teaching films and supplementary teaching films. For example educational film like Chadrigupt Murya may be shown to the students and then they are asked some comprehension question or they are asked to descried something or write a piece of composition. It will improve the different abilities like thinking, speaking, explaining comprehending etc of the learners.

Educational Value of films:-

1. Educational films motivates the learners and creates interest in them so that learning may become more fruitful and effective.
2. They helps us to develop imagination power of the learners.
3. They reduces the load of work of the teachers.
4. They brings past and present in the classroom. The historical events, growth of flowers and plants, the occurrence of chemical phenomena etc can be reconstructed through the films.
5. They make classroom interaction lively, interesting and brings variety in methods of instructions like lecture followed by presentation method.
6. They help students in order to improve their different abilities interms of reasoning, explaining, comprehending etc.
7. They reduce verbalism of students and brings effectiveness in the learning process.
8. It develops "We feeling" among learners by showing the films like freedom struggle of India, Eid, Dipwali etc.

II. Film – Strips:-

A film – strip is 35mm wide and has a series of 12 to 48 picture frames arranged in a sequence so that they develop a theme. A film – strip can be prepared by taking a series of photographs using a 35mm camera and then by taking a positive print of the negative film on another 35mm film. They are then projected on a slide projector or a film strip projector. According to Good`s dictionary of education, a film – strip is, "a short length of film containing a number of positives, each different but usually having some continuity, intended to be projected as series of still pictures by means of film strip projector. These are available in market and in libraries. A wonderfully inspiring and informative series of twenty film strips, entitled 'Bring India to your class – room' has been released by the Al Mervyn studio, Mumbai. The material of this series ranges from India`s land and people to her agriculture, industries, hill stations and cultural activities etc.

Educational Significance:-

1. They are helpful for composition lessons.
2. It allows maximum participation of the students.
3. All subjects content material can be made interesting and effective with the help of film – strips.
4. It is economical interms of time and energy. It saves the time and energy of both teacher and taught.
5. It develops the habit of discussion, explanation, argumentation among learners by projected different content materials in a logical sequence on a screen.
6. They are good substitutes for direct experience of the learners including different topics like atomic energy, sulphur and its compounds, citizenship etc.

iii. Over – head Projector:- Over – head projector is a device that can project a chart, a diagram, anything written on transparent sheet etc upon a screen on the white wall in front of students in a class. The name 'over-head projector' comes from the fact that the projected image is behind and over the head of the speaker/ teacher. In it, a

transparent visual is placed on a horizontal stage on top of light source. The light passes through this transparency and then is reflected at 90° angle on the screen at the back of the speaker.

Educational Significance:-

1. It helps us to make teaching more illuminative, illustrative and impressive.
2. It is economical interms of saving teacher`s time used in drawing or writing.
3. Transparent sheets once prepared can be used for future displays while taking up the same topic.
4. The teacher can maintain complete class control and interest in a lesson by turning a switch on or off.
5. It can be used for large group of students in any type of classroom.
6. Problems like writing on blackboard, rub the written material occasionally etc. have been overcome by the use of overhead projector.
7. Whether in a teaching or a presentation situation, the audience sees the visualization from the same point of view as the communicator. The feeling of oneness with the communicator is created.
8. The teacher can always face the class, maintaining eye contact with the pupils.

IV. Slides or Transparencies:-

A slide is a piece of film in a frame for passing strong light through or to show a picture on a surface. It is a piece of transparent surface like cellulose acetate film, translucent paper, glass etc of a specific dimension with drawings or pictures which can be mounted individually for use in a projector or for viewing by transmitted light.

Educational value:-

According to Hass and Parker (1954), the following are the advantages of slides:-

1. Attract attention
2. Arouse interest
3. Assist lesson development
4. Test student`s understanding
5. Review instruction
6. Present next lesson or subject
7. Facilitate student teacher participation.

NON – PROJECTED TEACHING AIDS

Teaching aids which do not help in their projection on the screen are called as non-projected teaching aids. It includes the following:-

1. ***Graphics:-*** Graphics are two dimensional aids. These are related to writing, drawing, painting etc. These aids involves the use of graphic presentation in the form of graphs, maps, diagrams, charts etc. The main graphic aids are as:-
    - I. **Diagrams:-** A diagram is a drawing that shows arrangements and relations as of parts to the whole. It is a visual symbol made up of lines, curves and geometrical forms. These are used for teaching science, geometry, geography etc.
    - II. **Graphs:-** A graph is a diagrammatic treatment or representation of numeric or quantitative data. They are considered as pictures which are self – explanatory and tells their story at a glance. They are used for analysis, interpretation and for comparison. The different types of graphs include line graph, bar graph, circle or pie graph, pictorial graph and flannel graph.
    - III. **Maps:-** A map is an accurate representation of plain surface in the form of a diagram drawn to scale, the details of boundaries of continents, countries etc. Geographical details like location of mountains, rivers, altitude of a place, contours of the earth surface and important locations can also be represented accurately with reference to a convenient scale with suitable colour scheme. Maps are of different types viz cadastral maps, topographical maps, wall maps, atlas maps, relief maps, geographical maps, mineral maps, agricultural maps etc. As a teaching aid, they are indispensable in teaching fundamental concepts such as size, distance, space, location and direction.

IV. **Posters:-** A poster is a bold and symbolic representation of a single idea. It is used in all walks of life, to convey, forcibly the desired information to a layman.

V. **Cartoons:-** A cartoon is a metaphorical presentation in the form of picture or a sketch. It is universal in appeal and conveys only one idea.

VI. **Flash Cards:-** Flash cards are pieces of card board or hand paper on which a word or words are written or some picture is drawn. These can be used for word recognition, team competitions, teaching in speaking, teaching writing, match cards, order cards.

VII. **Charts:-** A chart is a combination of pictorial, graphic, numerical or vertical materials which presents a clear visual summary. The most commonly used types of charts include outline charts, tabular chart, and organization charts.

Educational Significance:-

1. Graphic aids could be prepared by any teacher using simple material that is easily available and then can be stored for future use.
2. They help us to show relationship by means of facts, figures and stastics.
3. They help us to understand abstract concepts and ideas in visual form.
4. They help us to secure the attention of the pupils by their attractive format and simplicity of layout.
5. They help us to gain the concepts of size, distance, space, location and direction by means of maps.
6. They develop the power of analysis, synthesis and deriving conclusions from the said data.
7. The data presented through graphics can be easily understood and grasped.

2. 3-D (three dimensional) teaching aids:-

It is not always possible to bring real objects in the classroom due to the reason that they may be too large or too small in size to be brought in the classroom. It may also be too dangerous and expensive for ordinary class use. In such situations, a teacher searches for some good substitute for the real objects which are three dimensional in nature. These teaching aids have three dimensions – length, breath and height. Models, mock-ups, globes, diorama, puppets and holograms are included under three dimensional aids.

I. **Models:-** A model is usually the miniature structure of the original object. They are the replicas or copies of the real objects. According to Edger Dale, "a model is a recognizable imitation of the real thing with an increase or decrease in size as the chief difference". Thus they may be of the same size or large or smaller than the thing it represents. They simplify reality and are helpful to create interest in creative activity among pupils. They are generally of three types- solids, cross- sectional and working models.

II. **Mock – ups:-** It refers to a specialized model or working replica of the object being depicted. In a mock – up, a certain element of the original reality is emphasized or highlighted to make it more meaningful for the purpose of instruction. A model is a recognizable limitation of an object, while a mock-up may or may not be similar in appearance. These are often used in technical institutions for training purposes.

III. **Globe:-** A globe is the three dimensional representation of the surface of the earth on a very small scale. It is a round shaped wooden or plastic model of earth. According to Mckinney, "Globe is the most direct and versatile instrument of mathematical analysis". Its language is of colour and symbols. It is used for teaching history and geography to the students. It provides us information about areas, distances, directions, time location, symbols, colours, boundaries, rivers, change in weather, season, day and night etc.

IV. **Diorama:-** A diorama is a three dimensional scene in depth incorporating a group of modeled objects and figures in a natural setting. The diorama scene is set up on a small stage with a group of modeled objects kept on the foreground which is blended into a painted realistic background. They are very effective in the teaching of biological and social sciences.

V. **Holograms:-** They are three dimensional images of wonderful reality. There images are created on a holographic (lens less photography) plate without a camera. They are less frequently used in schools, as preparing them requires lot of technical skills as well as equipment.

Educational Significance:-

1. Three dimensional teaching aids motivates the students and makes them to learn things interestingly.
2. They are used for teaching different concepts like areas, distances, boundaries, rivers, time, weather, seasonal changes, the motion of earth etc.

3. They are helpful in technical education for training purposes especially in engineering filed.
4. They concretize abstract concepts.
5. They are used to dramatize any historical event like war, life of people during a particular period and thus gives actual experiences to pupils.
6. They are helpful for developing creative power among students.
7. They involves the principle of learning by doing or acting by involving students in preparation of models, dioramas, mock-ups etc, which provides first hand experiences to the students.
8. They can be used for a wide range of instructional situations.

3. Display boards:- A display is an organized visual arrangement of learning materials on a vertical or horizontal surface and is usually designed to present significant information on a given topic. Bulletin Board, flannel board, pocket board, peg board, hook and loop board, magnetic board and blackboard come under the general head of 'display boards'

I. Black board:- Blackboard and a piece of chalk prove very helpful in illustrating concepts and ideas to the students. It is a smooth surface upon which words or illustrations can be written or drawn by means of chalk. It is the oldest and best friend of a teacher. It is the mirror through which students visualize all about the teacher`s mind regarding the lesson in hand, his way of explaining, illustrating and teaching as a whole. They are various types – fixed blackboard, blackboard on easel, roller blackboard, graphic board, magna board etc.

II. Bulletin Board:- According to Good`s dictionary of education, a bulletin board is, "a board to which can be fastened pictures or other materials that are intended for display". It is a board of soft wood or cork. It displays bulletins, announcements, records, news items, newspaper cuttings, illustrations, achievements etc.

III. Flannel Board (felt board):- It is a wooden board on which flannel is fixed like cloth of any colour. The different flash cards on the back which flannel is fixed, can be placed on the flannel board. It is really a very useful, versatile and existing aid.

IV. Pocket board:- It is a wooden board on which pockets are made with about 1 ½ inch wide cloth wrapped from one corner to the parallel to the base of the board. The pockets so formed are ment for holding the flash cards.

V. Magnetic boards:- It is a display board made up of milky glass sheet. There are four magnet strips spread over length – wise iron letters from the material to be displayed. If tube lights are fixed at the back of the glass, the material will be visible even at nights.

Educational Significance

1. They help to present visual ideas and concepts and helps to develop creative activities among students.
2. They display a wide variety of materials like outlines, directions, definitions, keywords, daily assignments etc. which are quite helpful for the learners in order to broaden their vision
3. They are helped in better and clear understanding and promotes permanent retention by means of illustrations and sketches.
4. They are not only useful for teaching – learning process but also brightens the school.
5. They are economical in term of time and energy.
6. They are useful interms of spellings, reading in English, formation of sentences, picture composition etc.
7. They are useful for promoting artistic tastes of the students.

USE OF RADIO, TV AND NEWSPAPER

Radio (audio – aid)

The aids which use sense of hearing are called audio aids. These include human voice, gramophone records, audio tapes/ discs, stereo records, radio broadcast and telephonic conversation.

Radio is a very common type of hardware teaching aid. The use of radio for educational purpose was tested in England in 1924. School broadcasting was started in 1932 from Kolkata. Institutions such as Central Institute of Educational Technology, New Delhi, State Institute of Educational Technology, cells of SCERT produce need based auto – programmes for school children. Radio brings subject experts and other great men in the classroom. R.G. Reynolds writes, "Radio is the most significant medium for education in its broadest sense that has been introduced since the turn of the Century. As a supplement to classroom teaching its possibilities are almost unlimited. Its teaching possibilities are not confined to the five or six hours of the school day. Radio brings subject experts programmes for school children. It is available from early morning till long after midnight. By utilizing the rich educational and cultural offerings of the radio, have access to the best of the world`s stores of knowledge and art. Some day its use as an educational instrument will be as common place as textbooks and blackboards."

The radio broadcasts are generally used to introduce a new lesson, to present a complete lesson, to review the previous lesson and to solve major problems occurring in a lesson. The National policy on education 1986 and modified policy, 1992 has observed, "the media has profound influence on the minds of children. The mass media make the constraints of time and distance manageable. Modern educational technology must reach out to the most distant areas and the most deprived section of beneficiaries simultaneously with the areas of comparative affluence and ready availability."

Educational Significance:-

1. It is a very effective media for broadcast of lectures by eminent educationists, scientists, historians etc. It is a rich medium of drama, stories, commentary, sports news, educational news and educational programmes.
2. It brings the school into contact with the world around.
3. It develops critical thinking among students.
4. The general knowledge of the pupils is widened. They are able to have extensive knowledge of many things.
5. It helps in the spreading of elementary education, adult education, non-formal and continuing education.
6. It promotes an alternative approach to the education of out of school children.
7. It promotes emotional and national integration.
8. It provides information about population education, energy conservation, preservation of wild life etc.
9. It is a very important medium for leisure time activities.
10. A single broadcast can be heard and understood by a large number of students at a time. The cost per capita of the listeners is very small and is almost negligible.

ii. Television:

The television, queen of audio – visual aids or the electronic blackboard of the future, has become child`s third parent and a first teacher. First it was used for instructional purposes by the USA. In 1958, a project entitled continental classroom started instructional television for the whole of USA. It telecasted a programme, "physical of the Atomic Age", for science teachers. About 40, 000 teachers received instruction through this programme. In India, it was first used in schools of Delhi in 1961. Later the scheme was taken up by Doordarshan Kendras of Mumbai, Madras and Srinagar. The satellite instructional television experiment (SITE) was conducted for about one year in rural areas. Educational televisions are of two types viz open circuit television (OCTV) and closed circuit television (CCTV)

Educational Significance:-

1. It permits the use of the best available teacher to teach a subject for a large number of student viewers. It preserves the expert teaching skills of such teachers on video tape or film for later use.
2. It can bring industry and field work into the classroom. It can take the classroom to the distant places.

3. It provides a common experience to all students when they all see the same basic ideas or techniques on television.
4. It helps in improving the pronunciation of the students. Listening, speaking and understanding abilities of the learners can be improved.
5. It provides the teacher an opportunity to observe the instructional methods and ideas of their experts and to increase his own knowledge of teaching methods and stimulate new ideas.
6. It allows the teacher to observe individual students or to assist them during the television presentation, or to determine what needs further application after the presentation.
7. The gifted children can be benefited because they can do some work of advanced nature which is usually not available to them in their in their classrooms.
8. It helps in reducing the load of work of the teacher.
9. It helps in making school as a centre for community welfare and education.
10. It makes quick and lasting visual impressions which can often reduce the time necessary to teach an idea or technique.
11. The use of different types of audio- visual aids by the teachers in their classrooms is expensive. On the television such lessons involving the use of many aids may be telecasted. It will reduce the expenditure on teaching.
12. It can motivate the viewers i.e, create greater interest in learning.

iii. Newspaper:-

Newspapers are regarded as the most powerful mass media and thus have become the indispensable necessity of civilized life. They play an important role in teaching – learning process. According to Good`s dictionary of Education "newspaper is a periodical printed in the format of a new large folded sheets, devoted primarily to news and other materials of great interest, numbered serially, published at stated intervals, usually daily or weekly in the commercial field, but perhaps fortnightly or monthly in the scholastic field." They are full of information about the general economic and social life of the people of a special region and country. They are infact, the minimum text – book for the study of current affairs.

Educational Significance:

1. They are very useful for the study of languages. Pupils learn many new words and many new expressions. They learn how to express themselves and how to follow the expression of others. As regards social studies, they learn a lot about the society. There is much geographical and scientific information also in newspapers.
2. The life sketches of great personalities, educationists and the description of historical places can enrich the curriculum.
3. They provide us knowledge of examination results, admission, notices and job opportunities.
4. They help the students in preparing better for the different competitive examinations.
5. They develop in the students love for literature. Materials of literacy type such as stories, poems, pieces of literary taste are presented in the newspapers on week ends.
6. For international understanding, the study of newspapers is essential. Children come to know how the world is progressing, how we are woven internationally, how the events occurring in our country affect all the other countries of the world and how we shall have to suffer if the third world war breaks out.
7. In this fast changing world when there is explosion of knowledge, newspaper helps the students to update their knowledge in every field.
8. In the teaching of arithmetic, the newspapers can furnish examples concerning banks, interest on saving accounts, deposits is also very helpful in the teaching of economics and commerce. Likewise a lot of information on various subjects is available from newspapers which can be used in daily teaching.
9. It develops the power of judgment and critical thinking among students. It also develops the scientific approach to problem solving among students, in the handling of various issues.
10. They are motivating and creates interest among learners in what is now happening than the past. It serves as a wonderful motivational aid. It is the process of going from the known to unknown, from familiar to unfamiliar.

TEACHING DEVICES

Teaching of any content requires the achievement of certain objectives. In order to achieve the set objectives of teaching, the teacher uses different types of teaching methods, techniques, devices and strategies. These different strategies makes his teaching interesting, effective and successful one. The word 'device' is often synonymously used with method and technique. According to A. H. Garlick," Teaching devices are the teacher`s tool and if good work is to be produced, the right tools must be used in the right way". A device is a plan, scheme or trick invented for the purpose of effective teaching and purposeful learning. The teaching devices are those which a teacher is expected to use while conducting the formal lesson for the first time. According to Raymont, "Devices are certain external forms or modes which his (teacher`s) instructions may from time to time assume. "They are different from methods of teaching in the sense that they are formal structure of the sequence of acts commonly denoted by instruction and it includes different techniques and devices. Different devices may be employed within one method e.g; in lecture method, a teacher may use many devices like explaining, illustration, assignment, discussion etc. While as a device is an external mode of form which instruction may vary from time to time assume. It contributes to the success of a method. Like a human body consists of different organs, same is the case with a method which consists of different devices.

Importance:-

According to John Mandler, there are five main reasons which might justify the use of these devices in teaching learning process. These are:-

1. **To teach thoroughly:-** Devices of teaching should be used in order to teach more thoroughly so that children may retain the subject matter taught.
2. **To teach quickly:** They are used to teach quickly. This will result covering more syllabus in a given time.
3. **To create interest:-** They should be used in order to create or sustain interests in the pupils.
4. **To Integrate work:-** They serves as means of integrating a number of separate pieces of work, already learned by other means.
5. **To bring something new:-** They are helpful in bringing something new to children in a simplified way.

The main devices of teaching include:-

i. Home Assignment:-

Home assignment is the work or assignments carried out by the students at their homes. Its main object is to supplement the class work. It is most frequently used by teachers in teaching higher classes. It is useful to the child in the sense that it is a step towards self- education, enabling the child to use his own resources and work unsupervised. According to Prof. Yoakam, the main steps involved in making assignments includes reference to previous experiences, discussion, proposal of new activity, acceptance of the activity, explanation and clearing up the difficulties, planning the material to be used, assigning the tasks to be done and overseeing the beginning of the work, if possible.

Educational significance:-

1. It helps to develop the study habits among learners.
2. It develops the power of independent and unaided work in the child.
3. It provides opportunity to encourage initiative and to obtain co-operation of pupils.
4. It helps in covering the lengthy and heavy syllabi and provides opportunity for the review, revision and supplementation of classroom work.
5. It stimulates thinking and develops insight and understanding.
6. It serves as a best tool to cheek the abilities and capacities of learners.
7. It is an effective means of fixing up the subject matter taught in the class.
8. Right type of attitude towards study is developed by this technique.
9. It motivates the students for advance study.
10. It has given the teacher opportunity to give directions to the learner`s activity.

II) Discussion:-

Discussion popularly known as 'Group discussion' is an organized conversation in which members of a group actively participate and exchange their ideas with a purpose. It is a democratic and child centered instructional strategy. According to Johnson, "it is social action in its pure form". In discussion, a topic or issue is taken for

discussion. There takes place exchange of opinions and ideas. All the students address to the teacher and give their arguments and then ultimately gives one shape to different thoughts presented by the students during classroom interaction.

Educational Significance:-

1. It helps in developing the problem solving capacity and creative ability among learners.
2. It helps in developing good habits and discipline among learners. They learn to take turns, listen attentively, act co-operatively, speak distinctly, respect the ideas of others, share interests, ask pertinent questions and comprehend the problem.
3. It helps students in knowing what they do not know and what they have overlooked and where they are mistaken both as to facts and methods of interpreting them.
4. It clarifies the doubts of the students.
5. It develops the right type of attitude and the ability to tolerate anti-ideas of others.
6. It provides factual information and conceptional knowledge.
7. It identifies and discovers talented students who have potential for becoming good leaders, administrators and over all good educationists.
8. It encourages active participation with originality and independence.
9. It involves reflective level of the students which is most thoughtful and employ independent thinking of the participants.
10. It gives awareness of theories and principles and provides solution of certain problems.

iii. Dramatization:-

Dramatization is a teaching device where the teacher as well as students play different roles in order to make the content lively and interesting. It is a synthetic art where the content takes the shape of actors. It is activity centered device. It needs experienced teachers to use it in the classroom teaching. It is an act of dramatizing which helps in understanding the concepts and events related to various subjects of the school curriculum by covering them into an act of play or drama. It involves the following steps in its organisation.

I. Selection of students.
II. Selection of teacher incharge.
III. Selection of play.
IV. Preparation of the play.
V. Student`s contribution.

Educational significance:-

1. It develops the imagination of the students which is the basis of good teaching learning. It trains the imagination and develop initiative, originality and ingenuity.
2. It is an established device of teaching more specially in the teaching of history and languages.
3. It may be used in many subjects like history, geography, art, music etc. to gain knowledge.
4. There is healthy release of emotional feeling of the children and it helps in the proper socialization of the students.
5. It develops many cognitive and mental abilities of the learners like memorize, imagine, thinking and reasoning.

IV. Illustration:-

Illustration as a teaching device makes the content material more interesting, understandable and clear. It means use of different concrete materials in order to clarify the different ideas and concepts. In it, the knowledge of new objects is imparted to the pupils by using solid objects. They are two types viz verbal and non-verbal or visual illustration. The illustrations which are presented verbally are called verbal illustrations. It includes stories, anecdotes, descriptions, analogies and comparison similes and words. Non – verbal illustrations or visual or objective illustrations act directly through senses. It includes models, maps, pictures, charts, sketches, graphs etc.

Educational Significance:-

1. They develop the curiosity and interest of the pupils.
2. They make the abstract ideas concrete and make the task of teaching- learning easy and interesting.
3. They introduce variety and novelty in the lesson.
4. It is very useful in making some idea or mental picture more clear, definite and precise.

5. They make an appeal to the senses and the imagination of the learners and make the idea clear to the children.

Lecturing:-

When a teacher takes the help of a lengthy explanation in order to clarify his ideas or some facts that explanation is termed as lecture. In the words of James M. Lee, "The lecture is a pedagogical method where by the teacher formally delivers a carefully planned expository address on some particular topic or problem". It is an autocratic instructional strategy where only teacher remains active and the listeners just silent spectators. Most of teaching devices are involved in lecturing like discussion, dramatization, illustration etc.

Educational Significance:-

1. It is an economical teaching device. No laboratory, apparatus, gadgets etc are required.
2. It can be used for a very large group of students without the use of other aids.
3. It provides training to the pupils in listening and taking rapid notes.
4. It is used to achieve the cognitive and affective objectives.
5. It gives students good training and experience in the development of certain skills like learning by hearing, writing while taking notes, attending the auditory and visual presentation.
6. It provides the opportunity to the teacher to use different techniques and methods like question – answer technique, discussion method etc. in order to capture their attention towards the lecture.

VI. Narration:-

Narration is an oral communication of some reference, object or an incident which is presented in such a way that a mental picture is formed in his mind. It means telling stories, giving accounts of events or recounting some past incident of life. According to Panton, "Narration is an art in itself, which aims at presenting to the pupils through the medium of speech, clear, constructs these happening and they live in imagination through the experiences recounted either as spectators or possibly as participation." The success of this device depends upon the ability of the narrator, his speech, language and the way of narrating.

Educational Significance:-

1. It provides so much knowledge to the pupils that they need not to read various books.
2. It helps the children to learn quickly by making the subject matter interesting and easy to grasp.
3. It can be used to track almost all the subjects of school curriculum.
4. It can guide the pupils properly. This makes them interested in solving various problems of life.
5. It make use of illustrations such as models, charts, maps, graphs etc. in order to make the content more interesting and likely.

VIII. **Observation:-** Observation means use of sense organs to know about different things, persons, places and events lying in our environment. According to Mrs. P.V. Young, "Observation is a systematic and deliberate study through the eye, of spontaneous occurrences at the time they occur. The purpose of observation is to perceive the nature and extent of significant interrelated elements within complex social phenomena, culture patterns or humans conduct". It is a useful device of teaching in the hands of a teacher. For example, the teacher displays a model of heart and asks the students to observe the model carefully and then they are asked to speak one by one about the details of the model they have seen. It is of many types like uncontrolled, controlled, participant and non- participant or quasi – participant observation.

Educational Significance:-

1. It is useful in the sense that students make new discoveries and conduct researches in the field of science.
2. It develops the power of imagination, thinking, reasoning and drawing conclusions etc.
3. It helps the students in clarifying and removing of doubts by obtaining empirical knowledge.
4. It develops the different qualities in an individual like planning, organizing, executing and evaluating.
5. It gives opportunities to the students to become a part of teaching – learning process. They do not remain passive listeners and indifferent observers.

VIII. Source Method:-

Source method means the teacher will tell the different sources from where some information can be received or collected. It an activity method of teaching social sciences and sciences. It provides first hand experiences and lead to better understanding of the subject. It means the utilization of the available human and material sources capable of providing useful information and knowledge related to a particular subject or topic for the realization of the stipulated teaching – learning objectives in a particular teaching – learning situation. The different sources which are available for making content interesting and fruitful include written records, institutions of social interest, building and monuments, tools, rocks, metals and stone inscriptions, coins, literature etc.

Education Significance:-

1. It is helpful in the sense that it develops the habit of self-study, self – evaluation, i.e, it makes the learners research minded.
2. It is very useful in the learning and teaching of the concepts, facts, principles, events, phenomenon related to different subjects.
3. It develops the skills of collecting data, shifting the relevant and organizing the same.
4. They get first hand experiences about different sources which retains for long time.
5. It makes the teaching more realistic, more interesting and more vivid.

IX. Story telling:-

Story – telling is a form of narration. It means to recite or to tell a story. In it, the teacher orally narrates or describes in a very lucid, interesting and lively style, the orderly sequenced events composed in the form of a story to a learner or a group of learners for the purpose of explaining, illustrating and highlighting the facts, concepts, processes and events related to his topic of teaching. It is psychological in nature and is mainly used in lower classes in a special way.

Educational Significance:-

1. It helps in developing the imaginative and reasoning power of the students.
2. It presents content according to psychological needs of the pupils, so the content learnt by them becomes effective and fruitful for them.
3. It helps the teacher for making the difficult and abstract concepts and ideas of their content clear and meaningful to the students.
4. It helps the learners to learn how to face different types of problems and solve them through their initiatives and self efforts.
5. It is used for all types of learners because each student like the story – telling method.

X. Study habits:-

Individuals differ from one another in their habits. The habits possessed by the students in carrying out their study in different subjects is called study habits. These habits differ from individual to individual. Interesting and fruitful curriculum develops good study habits among students. Every classroom activity should be encouraging and purposeful. Every teaching period should be a thrill giving to the students and this in turn is bound to develop good study habits among students.

Educational Significance:-

1. It makes the learners handworkers and ultimately they come out as successful individuals.
2. It widens their mental horizon.
3. It makes them creative and research minded.
4. They become independent learners without depending upon the teacher unnecessarily and develops confidence among them.
5. It makes the learners to achieve continuing education and updates their knowledge throughout life.

MICRO-TEACHING

Historical Development:

A doctoral candidate Leith Acheson got information through a newspaper article about portable video-tape recorder invented by German Scientist in 1961. He was working with Robert Bush and D. Allen who recieved a grant to study those experiences which might be relevant for teaching interms of an innovative teacher education programme. Acheson saw the possibility of using the video-tape to provide immediate feedback to the teacher trainees interms of what occurred in the demonstration lesson. Acheson and other Stanford graduate students started to explore several different uses of the portable video-tape recorder and its potentiality in modifying the behavior of pupil-teachers towards desired objectives.

Micro-teaching was introduced in India in 1967 by D.D. Tiwari of Government Central Pedagogical Institute, Allahabad in 1970, G.B.Shaw experimented with micro-teaching at M.S. University, Baroda. Then the Technical Teachers Training Institute, Madras introduced micro-teaching to train the technical teachers. In 1974, Dr. N.L. Dosajh used micro-teaching as a teaching device in Teachers Training Institute, Chandigarh. He also wrote a book namely 'Modification of Teacher Behaviour through Micro-Teaching'. NCERT, SCERT, SIE's in the different states have been propagating this concept.

Meaning and Nature of Micro-Teaching:

The main objective of teacher-training institutions is to mould the behaviour of both pre-service and in-service teachers. They are trained in these institutions by providing them proper training. It has changed the old saying that teachers are born not produced, now we use that teachers are made, not born. It is the micro-teaching which has revolutionized the whole teaching-programme by providing training to both pre-service and in-service teachers. The term micro-teaching was first coined by Dwight Allen of Stanford University in 1963. It is a training concept which is scaled down interms of class, size and time in order to minimize the complexities of the normal teaching encounter. The length and scope of the lesson is reduced, only one skill is practiced at a time. Some of the definitions which will enable us to understand the meaning of micro-teaching are as:

i. D.W. Allen(1966):-

"Micro-Teaching is a scaled down teaching encounter in class size and class-time".

ii. Allen and Eve(1968):-

"Micro-teaching is a system of controlled practise that makes it possible to concentrate on specified teaching behaviour and to practice teaching under controlled conditions".

iii. R.N. Bush(1968):-

"Micro-Teaching is a teacher education technique which allows teachers to apply well defined teaching skills to a carefully prepared lesson in a planned series of five to ten minutes encounter with a small group of real class-room students, often with an opportunity to observe the performance on video-tape".

iv. Mc. Alesse and Unwin(1971):-

"Micro-Teaching is most often applied to the use of closed circuit television to give immediate feedback to a trainee-teacher's performance in a simplified environment".

v. B.K. Passi and M.S. Lalita(1976):-

"Micro-Teaching is a training technique which requires student teachers to teach a single concept using specified teaching skill to a small number of pupils in a short duration of time".

vi. Encyclopedia of education(Ed. Deighton, L.C. 1971):-

"Micro-Teaching is a real, constructed, scaled down teaching encounter, which is used for teacher training, curriculum development and research."

vii. N.K. Jangira and Ajit Singh(1982):-

"Micro-Teaching is a training setting for the student teacher where complexities of the normal classroom teaching are reduced by practising one component skill at a time, limiting the content to a single concept, reducing the size to 5 to 10 pupils and reducing the duration of the lesson to 5 to 10 minutes."

viii. Kumar(1996):-

"Micro-Teaching is a technique of training in which one learns the skills of teaching through a scaled down process of teaching learning."

From the above definitions, the following points highlight its nature/characteristics:

1. *Training Technique:-* Micro-Teaching is a training technique and not a teaching technique. It makes them to learn the art of teaching. The teachers are provided training through training institutions in order to mould their behaviour and to challenge the dictum "teachers are born not made".

2. *Miniaturized Teaching:* It is micro or miniaturized teaching in the sense that it reduced the complexities of real teaching by practising one skill at a time, reducing class size to 5 to 10 pupils, reducing duration of the lesson to 5 to 10 minutes, limiting the content in its scope and length.
3. *New Innovation:* It is relatively a new technique or new experiment in the field of teacher education more specifically in student teaching.
4. *Individualized device:* It is a highly individualized training device. Each trainee has to practise the different skills one by one until he gains mastery over all the skills and then use the integrated skills in a normal classroom.
5. *Feedback device:* It gives immediate knowledge of results or feedback to the trainees about their performances immediately after completing their lessons. This feedback is provided either through video-tape recorder or by the method master with the help of ratings.
6. *One Skill at a Time:* The normal classroom teaching uses integrated skills and through this traditional approach of teaching all the skills cannot be mastered. Micro-teaching provides opportunity to select one skill at a time and practice it through its scaled down encounter and then take other skills in a similar manner.

In conclusion, we can say that micro-teaching is a technique or device of imparting training to the inexperienced or experienced one's for learning the art of teaching by practising specific teaching skills through scaled down teaching encounter, i.e.; reducing the complexities of teaching interms of size, time and context.

Main Propositions/Assumptions:

Allen and Ryan (1969) mentioned the following main propositions of micro-teaching:-

I. Micro-teaching is a teaching technique, which is based on construction of a teaching situation in which the student teacher and pupils work together in a practice situation. Bonafide teaching does take place.
II. It lessens the complexities of normal classroom teaching, i.e, class size, scope of lesson and time are reduced.
III. It focuses on training for the accomplishment of the specific tasks. These tasks may be the practice of instructional skills, the practice of techniques of teaching, the mastery of certain circular material or the demonstration of teaching models.
IV. It allows for the increased level of practice. In a micro-teaching setting the time, number of pupils, methods of feedback and supervision etc; may be manipulated.
V. It greatly expands the normal knowledge of results or feedback dimensions in teaching. Immediately after teaching a brief micro-lesson, the trainee is engaged in a critique of his performance. All this feedback can be immediately translated into his practice when the trainee re-teaches shortly after the critique conference.

Phases of Micro-Teaching:

N.K. Jangira and Ajit Singh presented the three phases as follows:

a) Knowledge acquisition phase.
b) Skill acquisition phase.
c) Transfer phase.

a. KNOWLEDGE ACQUISITION PHASE:

In this phase, the concept of micro-teaching along with its various components are discussed. The knowledge about the different skills is provided. The method master delivers a skill lesson and the trainee observes this demonstration lesson. By observing the lesson, they discuss it with the method master, analyse its weak and strong points with a view to identify and discriminate the component behaviour of the skills. By observing this model lesson, they get training in both theoretical as well as practical aspects of that skill.

b. SKILL ACQUISITION PHASE:

After the trainee has received the theoretical background of the skill and a model lesson by the method master, the actual phase of acquiring the skill starts. The trainees now prepare their own micro lessons on a particular skill which is scaled down in all aspects. They now teach the particular micro-lesson to a particular group of students. This teach session is observed by the supervisor who gives immediate feedback to the trainee about his performance. After receiving the feedback, he again re-plans the lesson according to suggestions provided by supervisor and re-teaches his lesson to same group or another group of students. This is followed by a re-feedback session based on ratings of supervisor, students and if available by video-tape recording. This cycle is repeated till he gains mastery over the skill and in similar way, he practises all the skills one by one till he gains mastery over all the skills. He now prepares an integrated skill lesson and delivers it in front of trainees.

c. ***TRANSFER PHASE:***

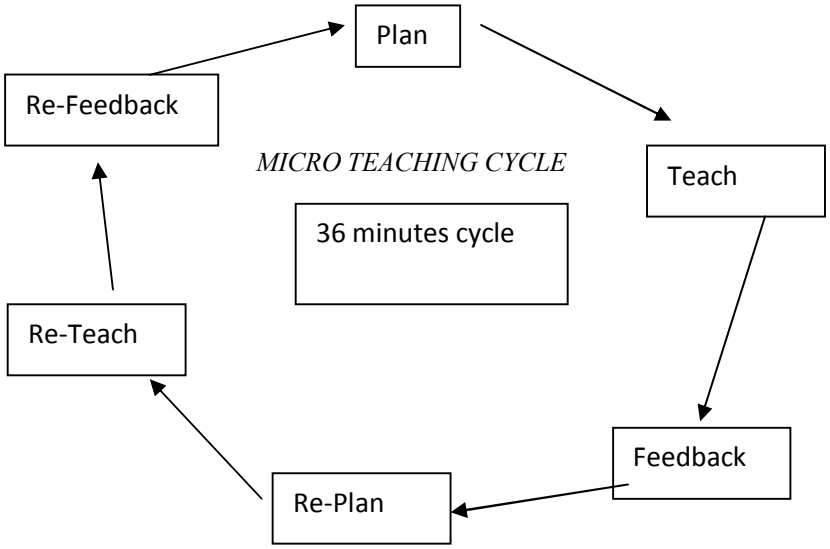
After gaining mastery over all the skills in the second phase, the trainees are now given an opportunity to face the normal classroom. Here size, time and context are not limited but his lesson is of 40 or 50 minute's duration including its size and scope. Instead of artificial situations, he teaches in the real classroom where he utilizes all the skills during presentation of one particular content.

Steps/Cycle of Micro-Teaching:

In micro-teaching, the trainee should follow the following steps in a systematic manner to achieve the required skills:

1. ***ORIENTATION:***
   In the beginning, necessary theoretical background is given about micro-teaching regarding its various aspects viz. concept of micro-teaching, procedure of micro-teaching, advantage, limitations and requirements and setting for adopting micro-teaching technique.
2. ***DISCUSSION AND SELECTION OF TEACHING SKILL:***
   After giving the necessary orientation regarding micro-teaching, the discussion about the different skills and their components takes place. The skills are thoroughly analyzed and discussed in order to provide the knowledge and awareness of teaching skills. A particular skill is selected for practice.
3. ***DEMONSTRATION:***
   After selecting a particular skill for practice, a demonstration or model lesson is presented before the trainees by teacher educator or supervisor. It is also called as modeling i.e.; demonstration of the desired behaviours relating to a skill for imitation by the observers.
4. ***OBSERVATION OF MODEL LESSON AND CRITICISM:***
   The demonstration lesson delivered by teacher educator or supervisor is carefully viewed, listened and observed by the trainees. This demonstration lesson is observed through different devices or observation schedules only to analyze the weak and strong points of the lesson in order to provide feedback to the person giving the model lesson.
5. ***PLANNING THE MICRO-LESSON:***
   The student teacher now plans his own micro-lesson with the help of his supervisor and preceding steps. The Indian model of micro-teaching developed by NCERT gives the following settings for planning the micro-lesson:
   a. Number of students 5 to 10.
   b. Types of students, real students or preferably peers.
   c. Type of supervisor: teacher-educators or peers.
   d. Time duration of 5 to 10 minutes.
   e. Time duration of micro-teaching cycle 36 minutes.
6. ***Practicing the Skill (Teach-session):***
   Under this step, the trainee teacher teaches his prepared micro-lesson for 6 minutes in a micro class. The lesson is observed by the teacher educator or supervisor or peers with the help of appropriate devices observation schedules.
7. ***Feedback Session:***
   The teach session is followed by feedback session. The trainee teacher is provided the feedback of his performance about the lesson he delivered in a micro-class. He is given suggestions for improvement in order to gain mastery over the particular skill. The feedback session lasts for 6 minutes where the trainees and supervisor discuss about his teaching behaviour.
8. ***Re-planning:***
   After receiving the feedback, the trainee teacher re-plans his micro-lesson keeping in view the suggestion got from different sources like peers or supervisor. This session lasts for 12 minutes. If the video-tape is available for feedback, he himself watches the use of different components of a skill and where the weakness lies.
9. ***Re-teach:***
   The re-planned lesson is now re-taught to another group of students for the same duration to practise the same skill. Again the supervisor or teacher educator observes his re-taught lesson by using appropriate devices or observation schedules. This session lasts for 6 minutes.
10. ***Re-feedback:***
    The re-teach session is followed by re-feedback which is of 6 minutes duration. The student teacher is again given feedback of his performance during micro-lesson.
11. ***Repeating the Cycle:***

The micro-cycle is repeated again and again till the student teacher gains mastery over the skill.



Advantages:-

1. It is an effective training device for helping the both pre-service and in-service teachers to face the hardships of normal classroom teaching in artificial situations. It means it reduces the fear or threat of the teacher to face normal classroom.
2. There is provision of immediate feedback and it helps the teachers to know their drawbacks and improve upon them.
3. It is an individualized training device. It helps each trainee to develop teaching skills at his own pace depending on his teaching abilities.
4. It develops a lot of confidence among trainees due to the facility of reduced complexities.
5. Continuous re-enforcement is provided to trainees in the form of feedback which improves their teaching ability.
6. It helps in acquiring various types of skills which ultimately form the basis of successful teaching.
7. It acts as a self-evaluation tool through the use of video or audio tape recorder.
8. It simplifies the study of interaction between the teacher and the pupils.

Limitations:

1. Competent and trained supervisors are needed for micro-teaching who are not available to make this innovation really fruitful.
2. It is mostly skill oriented and not content oriented.
3. Micro-teaching laboratories are not available in our Indian training colleges due to lack of financial support because it needs closed circuit television, tape recorders, video-tapes etc; which are costly.
4. It wastes the time of trainees because they have to practise a particular skill a number of times.
5. It disturbs the existing time-table of practising schools by calling 5 to 10 students for a few minutes for which both school authorities and parents shows opposition towards it.
6. It can be effective for micro classes but the macro classes' environment is different from them, so the teachers lose confidence in actual classrooms due to the availability of normal time, size and context.
7. It alone may not be sufficient to attain perfection in teaching. It needs the support of simulated teaching and interaction analysis.

Teaching Skills:

The main purpose of micro-teaching is to develop certain teaching skills. These teaching skills have been identified on the basis of research studies, classroom interaction analysis, theories of teaching and observations and experiences of investigations. A skill is a specific behaviour or activity which requires doing a particular work or job or task. Teaching skill is defined as a set of teacher behaviours which are especially effective in bringing about desired changes. These are the activities which a teacher uses to make his teaching more effective and successful.

Definitions:

i. *N.L. Gage:* "Teaching skills are specific instructional activities and procedures that a teacher may use in his classroom. These are related to the various stages of teaching or in the continuous flow of the teacher performance."
ii. *Joyce and Weil*: "Teaching skill is a particular teaching behaviour that contributes to the effectiveness and uniqueness of a teaching model."
iii. *Brown:* "Teaching skill is a set of related teaching acts or behaviours performed with the intention to facilitate pupils learning."
iv. *Joshi:* "Teaching skill is a set of behaviours, the occurrence of desirable behaviours and the avoidance of undesirable behaviours both being positively associated with certain instructional objectives or change in pupil."
v. *Asian Institute of Teacher Education*: "Teaching skill is a group of behaviours which can be developed through practice and can be used in an equally efficient manner in situations other than those utilized for its practice".

Thus, the teaching skill is a specific activity or behaviour of a teacher through which he makes his teaching effective. Allen and Ryan (1969) have suggested the 14 teaching skills viz. stimulus variation, set induction, closure, silence and non-verbal ones, re-enforcing pupil participation, fluency in making questions, probing questions, higher order questions, divergent questions, recognizing attending behaviour, illustrations and use of examples, lecturing, planned repetition and completeness. Passi (1976), Jangira (1979), Singh (1979), Paintal (1980) and Menon (1983) have suggested 19, 20, 9, 10, and 15 teaching skills respectively. Here we will concentrate on practicing selected teaching skills through micro-teaching.

Set Induction/Introducing Lesson:

The success of teaching-learning process depends upon the teacher's introduction of the lesson, how he will introduce his lesson in order to cater their attention and develop interest towards his lesson. Before the actual teaching starts in a classroom, he uses different techniques and methods in order to capture their attention, prepare their minds and motivate them only to receive new knowledge. Anything that a teacher does towards this end is known as introduction. The skill used in doing this is known as the skill of "Set-induction" or "Introducing a lesson". We can also call it as skill of motivation. It involves the use of previous knowledge, using appropriate devices, maintenance of continuity, relevancy of verbal or non-verbal cues and topic declaration. The various components listed above are explained briefly below:

1. ***Use of previous Knowledge:*** It means the achievements from previous experiences. The previous knowledge of learners forms the base for new knowledge. He establishes the link between the previous knowledge of the students with the new knowledge that the teacher wants to impart.
2. ***Using appropriate devices:*** Device refers to a technique that the teacher uses while introducing a lesson. He should make use of appropriate devices in order to motivate them towards the lesson. He may use examples, analogies, storytelling, role playing, audio-visual aids, demonstration, narration etc in order to motivate the learners towards the lesson. Use of devices depends upon the unit to be taught and maturity level of learners.
3. ***Maintenance of continuity:-*** It means the sequence of ideas or information being presented. Proper introduction requires the continuity in the sequence of ideas and information. Logical sequence is to be maintained between the main parts of the introduction.
4. ***Relevancy of verbal or non-verbal behavior:-*** The teacher should use relevant and sequenced verbal and non-verbal behavior.
5. ***Topic declaration:-*** The teacher should declare the topic or lesson after introducing the lesson. It indicates the beginning of presentation of the lesson.

Skill: Set Induction
Name of the teacher-trainee:-
Subject : Science
Class : VII
Topic : Tongue
Date :
Time Duration : 6 minutes

S.No	Pupil teacher`s activity	Student's activity	Components used
1.	Teacher enters the classroom and wishes the students 'Good morning'.	Good morning teacher	
2.	Dear students can you tell me what are organs	Organs are the parts of body that perform different functions	Use of previous knowledge
3.	Good, now tell me what do you mean by sense organs?	Organs by which we can fell any sensation.	Use of previous knowledge
4.	Ok, Tell me any one of you, how many sense organs do we have?	We have five sense organs.	Maintenance of continuity.
5.	Name those organs	Eyes, Skin, Nose, Ears and Tongue	Relevant statement and question.
6.	Name the sense organs which are used for seeing and hearing.	Eye and Skin	Questions followed by correct pupil response.
7.	Name the sense organs which are used for hearing and smell.	Ears and nose	Maintenance of continuity
8.	Name the sense organ which is used for taste?	Tongue	Relevant statement and question.
9.	Chart of the tongue is shown to the students.		Appropriate use teaching device.
10.	Dear students, Today our topic is about tongue.		

Skill : Set Induction
Name of trainee-teacher
Subject: History
Topic : Ashoka`s Kingdom
Class : VII
Date:

Time of minutes:

S.No	Pupil teacher`s activity	Student's activity	Components used
1.	Teacher enters the class and wishes "Good morning" to the students.	Students also wishes "Good Morning" teacher	
2.	In order to motivate the students, the teacher asks some questions by saying, "Who was Chanakya".	A learned Brahman.	Use of previous knowledge
3.	Whom was he insulated by?	One of the Nanda Kings	Maintenance of continuity.
4.	Good, therefore what pledge did he take?	To defeat Nandas	Questions followed by correct pupil response.
5.	Excellent, now can you tell me whose help did he take in fulfilling this pledge?	Chandra Gupta	Relevant statement and question
6.	Whom was he succeeded by?	Bindusara	Relevant statement
7.	Bindusara was followed by	Ashoka	Questions followed by correct pupil response
8.	Good, what do you know about Ashoka	Ashoka was the great king	Relevant statement
9.	Now, Tell me about the kingdom of Ashoka	No response	
10.	Dear students, today our topic is kingdom of Ashoka		

Observation with rating scale

Skill : Set induction
Name of trainee teacher :
Name of the observer :
Subject : Science
Class : VII
Lesson : Tongue
Date :
Time : 6 minutes

S.No	Components	Rating	Tallies
1.	Use of previous knowledge	0123456	
2.	Appropriate use of teaching device	0123456	
3.	Maintenance of continuity	0123456	
4.	Relevant statements and questions	0123456	
5.	Questions followed by correct pupil response	0123456	

Comments (if any)

ii. Stimulus Variation:-

Stimulus variation is defined as the change in teacher behavior to attract pupil attention. The teacher uses various stimuli in the class room so that they may produce maximum responses. Sinha Johsi writes, "What to change, when to change and how to change requires a skill on the part of the teacher for securing and sustaining attention at high level, such a skill is named as stimulus variation. "For securing the attention of the students, we have to create stimulating learning strategies. Variation in stimulus secures more attention among the students. It includes the following components:-

i. **Movements:-** To secure and sustain the attention in pupils the teacher should move from one place to another involving movements at the dice, towards blackboard and movements towards the students.

ii. **Gestures:-** Expressions of feelings and emotions involving nonverbal behaviours are called gestures. It involves the hand and head movements, eye movements, facial expression, body movements etc. The appropriate gestures increases the effectiveness of verbal communication.

iii. **Change in voice :** Constant use of the same level of pitch, tone and speed by the teacher makes his communication dull, inactive and has an adverse effect. The teacher can make sudden or radical change in volume, tone or speed of the verbal presentation. These changes in speech pattern makes the pupils attentive and the lesson more interesting.

iv. **Focusing :** It refers to teacher`s behavior that focus or direct pupil`s attention on a particular object, word, idea, rule or generalization. It includes verbal focusing (e.g, listen carefully), gestural focusing (e.g; pointing with finger to the boundaries of a country on a map), verbal and gestural focusing (e.g, look at the figure).

v. **Change in interaction style:-** When two or more persons communicate with each other, there is said to be interaction between them. In the classroom. Situation, three styles of interaction are possible i.e; teacher-class, teacher – pupil and pupil – pupil interaction.

vi. **Change in Oral-Visual switching:-** It refers to changes or variations in the sensory focus for imparting information to the pupils e.g, from oral to visual from visual to oral or a combination of oral and visual e.g, from listening to looking, from reading to writing, from speaking to doing etc.

vii. Pause:- It means silence for some seconds. In order to sustain pupils attention in the class, the teacher should introduce certain pauses during his teaching and before and after asking a question.

viii. Physical movements of the students:-It refers to the change or variation in the type, form, styles of the physical involvement of the pupils. Sometimes they may be engaged in handling apparatus or aid material and other times in dramatization, demonstration, writing on the blackboard etc.

Skill : Stimulus Variation
Name of the trainee teacher:
Subject: Science
Topic : Formation of organ system
Class : VII
Date:
Time duration: 5 -10 minutes

S.No	Pupil teacher`s activity	Student's activity	Components used
1.	Teacher enters the class wishes "Good morning" to the students.	Students also wishes "Good Morning" teacher	
2.	Teacher pauses and raises his finger, can you tell me what is the basic functional unit of life?	Cell	Pause, movement, oral-visual switching
3.	The teacher tells one student to stand up with the help of his finger and asks him, do you know what cells form when they combine	When cells combine they form tissue	Focusing, movement, oral-visual stwitching
4.	Good, When tissues combine together they form	They form organ	Pause, change in speech pattern
5.	What organs form when they combine	Organ system	Gestures movements
6.	Name some organ systems	Excretory system, digestive system etc	Pause, oral - visual switching
7.	Good, so, have you all understood, today`s lesson that how organ system is formed.	Yes teacher	
8.	Any question		

Skill : Stimulus variation
Name of the trainee teacher:
Subject : History
Topic : Taj Mahal
Class : VII
Date:
Time duration : 6 minutes

S.No	Pupil teacher`s activity	Student's activity	Components used
1.	Teacher enters the class and wishes "Good morning" to the students.	Students also wishes "Good Morning" teacher	
2.	Teacher shows chart and asks students what is this?	Taj Mahal	Oral-visual switching, movements, Gestures
3.	How many of you have visited to Taj Mahal	Few students raise their hands	Change in speech pattern, movements, oral- visual switching .
4.	Ok students, tell me who built the Taj Mahal	Shah Jahan	Change in interaction style, movements
5.	In whose memory he built it	His wife, Mumtaz	Gestures, focusing, change of voice
6.	Teacher gives pause and said when she died was buried in Agra and Taj Mahal was constructed over her grave.	Students listening carefully	Focusing, pause movements
7.	Taj Mahal is made of pure white marble stones called	Sangi marmar	Changes in interaction gestures, focusing
8.	Teacher said very calmly you know, it took about 22 years for completion	Students listening carefully	Change in speech gestures
9.	Good, have you understood today`s lesson, thanks.		

SIMULATION

As we have observed that both human beings and animals are involved in training their youngsters to adjust and face the real life problems. At home, every day the children imitate their parents and elders with whom they utilize their maximum time. Sometimes the children sitting in a group, one child pretends to be a teacher and others to be pupils and play the different roles as they have observed in their school. When we turn towards different professional courses like medical, engineering, teaching etc, we observe the same cases of role playing, artificial training etc. Doctors are trained to perform operations by experimenting on frogs, rats and other animals in order to perform well in real life situations. All this leads us to conclusion that they involve the concept of simulation. In 1968, Cruic Shank developed a teacher training system which is denoted by several terms like role-playing, artificial teaching, pilot training, laboratory methods, clinical method and inductive scientific method.

Meaning and Nature:

According to its dictionary meaning, simulation stands for pretend to be, pretend to have or feel or role playing. It means the imitation of a particular appearance or form. The following definitions will help us in understanding the meaning of simulation.

i. ***Meggary:-*** "A simulation is a technique of teaching and learning in which the students are presented with selected elements of real life events, processes or conditions with specific roles to play and specific

goals to achieve. Use of simulation to effect specific needs and interests can provide great motivation for both the teachers and students".

ii. ***Harman:-*** "Simulations contain the important parts of, but not all of, reality. Simulations do not have to look like the real life counterpart, but they do have to 'act' like the real things".

iii. ***Fink:-*** "Simulation is the controlled representation of reality".

iv. ***Tansey:-*** "Simulation is the all inclusive term which contains those activities which produce artificial environments or which provide artificial experiences for the participants in the activity".

We can conclude that simulation is a technique in which the characters are artificial and the roles they play are real. It involves the training of individuals in different walks of life to gain confidence in real situations.

Simulated Teaching:

As we have thoroughly studied micro teaching, its procedure and practising of different skills. These skills are practised mostly in training colleges due to the lack of support from schools. The trainee performs different roles during their micro-lessons. They act as teachers, pupils and supervisors one by one. This act of training in simulated conditions is called simulated teaching. It helps the trainees to bring desirable changes in their behaviours through systematic and organized learning experiences in simulated conditions i.e., artificial laboratory like situations.

According to stone, "Simulation techniques, for all their artificiality can often be preferable to putting students in the classroom to learn, to teach of their own or to lecturing them about the classroom teaching. Simulated teaching for training would be teachers for teaching under simulated conditions, removes the risk from the first steps of the neophyte and enables them to come to terms with the demands of complex skill learning without the stress of the real situation. It is preferred to merely telling the student, how to reach or control the class, for which the same reasons, as it is better to allow the beginning pilot to practise operating the dummy controls rather than telling him how to do it when he finds himself in the air".

Simulated teaching enables the trainees to develop problem solving skills, encourage participation, involvement, creativity and a desire to learn.

From the above discussion, the following points highlight its nature/characteristics:

1. Good planning is the crux of success. Simulated teaching needs a systematic planning in advance. The different roles played by a trainee either of teacher, pupil or supervisor is planned in advance. Feedback and evaluation techniques are also finalized beforehand.
2. The main feature of simulated teaching is to provide immediate feedback to trainees about their performances in simulated roles. Feedback helps them to remove their weak points and to improve their behaviour.
3. All the roles to play by them are performed in artificial situations and it removes the risk of real situations. Through mock trails, they are fully trained to face the real situations without any type of confusion or problem.
4. Specific goals have to be achieved by playing specific roles. It means simulated teaching is goal oriented. What objectives have been set for a particular session, they are achieved through specific roles.
5. The different roles played by an individual are real but the characters are artificial in order to achieve the desired objectives.
6. Creation of proper environment and active participation of students makes this technique to function smoothly.

Mechanism/Procedure:

Flander has recommended the following steps in simulation training techniques:

1. *Selecting pupil teachers or assignment of roles:* A micro-group of trainees is selected in order to perform the roles of teachers, students and observer respectively. Role assignments are rotated by letters so that each individual has a chance to be an actor or observer.
2. *Deciding the Skill to be practised:* The skills to be practiced are selected and discussed. At this stage, a particular skill is selected and the planning and preparation for it are made. Each trainee chooses his topic to be practised on the basis of his interest and intelligence.
3. *Deciding considerations:* At this stage, the details of the work schedule are prepared. It is decided as to who will start his teaching first, who will act as supervisor and who will act as pupils. It is also decided at this stage that how everyone, turn by turn, will teach and how everyone will observe the lesson.
4. *Deciding procedure of evaluation:* At this stage, the decision is made regarding the observation of the different roles and of the lesson. What kind of data is to be recorded and the method of recording are decided in it.

5. *Practice session:* The practice session starts and its observations are recorded for judging the teaching behaviour. The trainee is observed by the peers and the supervisor in order to give him immediate feedback of his performance so that he may improve his performance in the next session.
6. *Alteration of procedure*: At this stage, the whole procedure is changed. The trainee who was performing the role of supervisor now acts as a teacher, who was performing the role of student now acts as a supervisor, change of teaching skills and also there occurs now change in the topic to be taught. Its main purpose is to give opportunity to trainees to play the role of a teacher, a student and an observer in order to handle actual classroom situations confidently.

Another View:

The main steps involved in the procedure of simulated teaching are as:

1. Orientation.
2. Selection of topic for teaching.
3. Demonstration lesson.
4. Formation of groups.
5. Assignment of roles.
6. Planning.
7. First practice session.
8. Follow-up.

Advantages:

i. It develops confidence among students by practising different roles in artificial situations in order to face real classroom.
ii. It increases learner's ability as decision makers in the problematic situations.
iii. It is useful for all types of learners-gifted or slow learners.
iv. It helps the teachers to improve their behaviour by providing them immediate feedback of their performance.
v. It can be used for different subjects including the topics like science adventures, mimicry, animal tales, biological journeys, mock parliament, medicine, engineering, military, industry etc.
vi. It provides the opportunities to pupil-teachers to study and analyze critical teaching problems.
vii. It establishes link between theory and practice.

Limitations:

1. There is no assurance to get real experiences in artificial conditions.
2. Beginners may face difficulty to practice all teaching skills e.g., skill of questioning.
3. It cannot be used for all subjects, e.g., art and painting.
4. It is costly technique because it needs sophisticated materials which are not available in our training colleges.
5. Observations may be wrong due to the role played by a new trainee, because to observe the trainees, it requires most competent and skillful persons.
6. It is time consuming technique because every trainee has to perform the different roles like teacher, student and an observer.

Role-Playing

Role playing is one of the methods of simulated teaching. It means to play the role of someone else. It is the act of assuming the identity of other persons and then react as they perceive their behaviour in a particular set of circumstances. It provides a lot of confidence to the person who is later on expected to play the role in real situations.

Procedure:

1. *Selection of topic or problem*: The first step of role-playing starts with the selection of the topic or problem. It should be according to the interests of the learners. The problem should be encouraging one and should have some relation with the learner`s near future.
2. *Motivation:* After selecting the topic, the learners should be motivated to play the different roles. They should be mentally prepared to play the different roles in different situations. Unless they are not motivated towards their roles, the whole effort may fail.
3. *Demonstration:* The supervisor himself gives demonstration by playing one role or roles. Its purpose is to prepare the learners mentally to remain ready for different roles.

4. *Assignment of roles:* Now the supervisor assigns different roles to different learners according to their interests and motivation. Some are given the role of teachers, some act as pupils and some assigned the role of supervisor.
5. *Play the different roles:* After assigning the different roles, the learners now play their roles. Every learner whether acting as a pupil or teacher should act with interest and enthusiasm. It helps them to attain the objectives set behind the problem.
6. *Follow up and discussion:* After performing their different roles, a discussion occurs on the basis of observed facts. This discussion improves their role playing behaviour by receiving suggestions from the observers. In case there arises the need of revision, the supervisor should allow them to do so. Supervisor's attitude must be encouraging.

PROGRAMMED LEARNING

A programme is the subject to be learnt by the pupil. It is a device to control the students` behaviour and help them to learn without the supervision of the teacher. Programmed learning is the arrangement of materials to be learnt, in graded steps of difficulty, in such a sequence and in such a manner of presentation that it will result in the most efficient rate of understanding and retention. The following definitions will help us to understand the meaning of programmed learning:

1. *Smith and Moore (1962):* "Programmed learning is the process of arranging the material to be learned into a series of sequential steps, usually it moves a student from a familiar background into a complex and net set of concepts, principles and understanding."
2. *Skinner (1954):* "Programmed learning is the first application of laboratory technique utilized in the study of the learning process to the practical problems of education."
3. *Leith (1966):* "A programme is a sequence of small steps of instructional material (called frames), most of which require a response to be made by completing a blank space in a sentence."
4. *Jacob (1966):* "Self-instructional programmes are educational materials from which the students learn. These programmes can be used with many types of students and subject matter either by themselves in the name of self-instruction or in combination with other instructional techniques."
5. *Susan Markle(1969):* "Programmed learning is a method of designing a reproducible sequence of instructional events to produce a measurable and consistent effect on behaviour of each and every acceptable student."

In the light of above definitions, it can be concluded that programmed learning is an auto-instructional technique. The information is usually provided in small steps called frames or didules. Each learner progresses at his own speed. Generally the instructions provided by a teaching machine or programmed text book is called programmed learning.

Characteristics:

The main characteristics of programmed learning are:

1. Programmed learning is a method of giving or receiving individualized instructions. It keeps in view their individual differences. The learner moves at his own speed according to his capability and capacity.
2. It is organized into logically clear steps with a view to avoid failure and corresponding sense of disappointment in the learner.
3. It brings change in every student's behaviour through instructional material. It clearly defines the entering and terminal behaviour of the learners.
4. In it continuous interaction occurs between the programme and the learner. In it, the learner remains constantly active by responding to each and every frame or didule.
5. It provides immediate feedback to learners about their results. He is informed whether his response is right or wrong.
6. In it, constant evaluation is possible by the record of student's responses. Here if the learner does not learn, it is the instructional material which is ultimately to be blamed. Consequential action of modification or restructuring is insisted as a part of its strategy.
7. It takes sufficient care in teaching the students to make discriminations among range of possibilities or to make generalizations from given data to new situation.
8. It is very systematic and sequenced.

Principles:

1. *Principle of small steps:* A programme is prepared with a large number of small and easy steps. They learn the material better when it is presented in small doses. It reduces their rate of committing errors and encourages them for further learning.
2. *Principle of active responding:* Programmed learning provides the information in the form of small steps and each step is required to be responded by the learner. Hence the learner is actively involved in the learning material. He does not remain a passive one even for a minute because whatever he has to learn, needs his active involvement in the programme. The frames should be so designed logically that the learner should show interest towards responding the frames or didules.
3. *Principle of immediate reinforcement*: Programmed learning involves to give immediate reinforcement to the learners. When the learner`s respond to frames, they do not know whether these responses are correct or wrong. By providing immediate confirmation of his responses, the learner gets confidence. When he is reinforced for correct responses, he becomes receptive for further learning.
4. *Principle of self-pacing:* Programmed learning rests on the principle of self-pacing. It recognizes the individual differences of the learners. Each learner is free to move according to his own speed, slowly or quickly as they like. The gifted children can learn things at a quicker speed and may skip one or more frames where as slow learners can go on slowly. It satisfies every learner as for as his speed of learning is concerned.
5. *Principle of continuous evaluation*: The Programmed learning is based on continuous evaluation by recording the responses of the learners. It helps to improve the quality of programmed material through checking the number of errors at each step and students` progress can be evaluated by looking into the various types of responses produced by the learner.

The principle of overt/active responding, immediate feedback and principle of small steps are called as obligatory or optional principles.

Styles/Types of Programmed Learning:

The main types or styles of programmed learning are as:

1. *Linear programming (B.F.Skinner).*
2. *Branching programming (N.A.Crowder).*
3. *Mathetics (Gilbert).*
4. *Computer-Assisted Instruction (Lawrence).*
5. *Learner-Controlled Instruction (R. Mager)*
6. *Mathegenics (E.Z. Rothkopt).*

Here, we will discuss only the first three styles of programmed learning:

1. ***Linear programming:*** this style of programming is also known as Skinnerian style of programming or single track programme or extrinsic programming. It was the first programme to be appeared on the educational scene. It was developed by B.F. Skinner and his associates like Dr. Holland of Stanford University in 1954. A programme in which each student does every frame in the same order no matter how adequate or inadequate his /her response is called linear programme. It is called extrinsic programming because the learning sequence is decided externally by the programmer and the learner has not any choice of choosing his own path.

In this type of programming, the instructional material is sequenced into a number of meaningful small steps called frames or didules. The learner is required to respond actively at each step. Immediately, after responding, the learner is given information about his response. Thus the following are the elements of linear programming.

1. *Information given in small steps.*
2. *Active responding by the student at each step.*
3. *Immediate knowledge of results.*
4. *Self-Pacing.*

   The programme is framed in such a way so as to reduce the error rate. Each frame is not only terminated with a question but also provides information to the learners. Clues or prompts are included in the programme if needed. The answer for each question is provided at the beginning of the next frame.

Example of linear programming:

Concept of transparent, translucent and opaque:

(Frame I):

We say that something is transparent if both light and clear sight can pass through it. Mark with the letter "TP" the items in the list below that are transparent.

(Frame I):

We say that something is transparent if both light and clear sight can pass through it. Mark with the letter 'tp' the items in the list below that are transparent.

Steel door

Tin can

Shoestring

Windshield of an automobile

Man`s handkerchief

Confirmation

'tp' Windshield of an antomobile

'tp' sunglasses

(Frame 2):

Choose those items in the list below that are transparent and mark them with the letters 'tp'

Watch crystal

Towel

Post card

Magazine Cover

Cellophene wrapper on a cigratte package

Confirmation

Tp A watch crystal

Tp cellophane Wrapper on a cigarette package

(Frame 3):

Define `transparent`

Confirmation means that both light and clear sight can pass through the object in question.

(Frame 4):

An object is translucent if only light can pass through it. In the list below, mark the items that are translucent with the letters 'Tl' and the objects that are transparent with the letter 'Tp'

Waxed paper

Air

Onion skin typing paper

Paper cup

Matchbox cover

Confirmation

Tl waxed paper

T_P – Air

T_p – onion skin typing paper

(Frame 5):

In the list below, mark the transparent items with the letters 'tp' and the translucent objects with the letters 'Tl'.

Frosted light bulb

Magnifying glass

Mirror

Coke bottle

One-dollar bill

Confirmation

Tl frosted light bulb

Tp magnifying glass

Tl coke bottle

(Frame 6):

Define `Translucent`

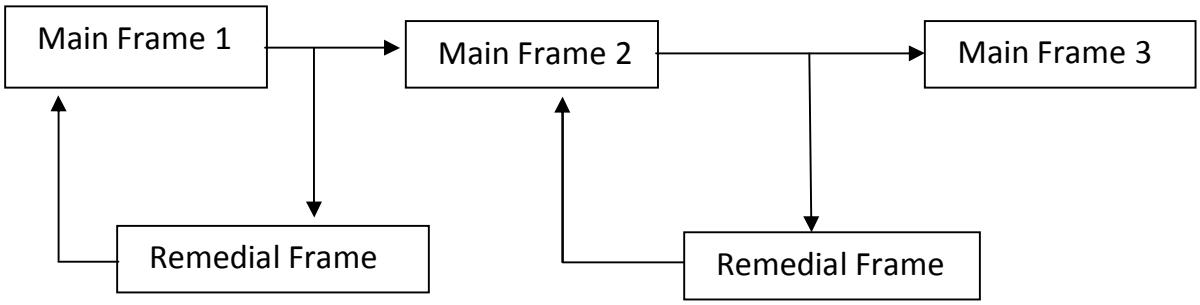
In similar way, the opaque concept can be gained.

B) **Branching Programing:-** This style of programming was originated by Norman A. Crowder. He thoroughly studied and analyzed linear programming. He noticed certain drawbacks of linear programming like subject matter is broken into very smell steps, responding is quite mechanical and restricted, learing process is slow, encourages guess work etc. He thought of another type that is called branching programming. It is also called as intrinsic or

adaptive programming. According to Norman A. Crowder, "Branching programming is a programme which adopts to the needs of the students without the medium of an extrinsic device such as computer."
In this programming, the learner is provided a content which is bigger in size as well as in information. The content may be of a paragraph or a page size. The learner is exposed to a short discussion of material to be learnt. This is followed by multiple choice questions designed to test student`s learning of the material. If the learner responds correctly, he is led to the next learning item and if he is incorrect, he has to go through the same learning material in order to know why he was wrong in choosing the correct response. After knowing the reason of his incorrectness, he is again allowed to select the right response by following the same content.

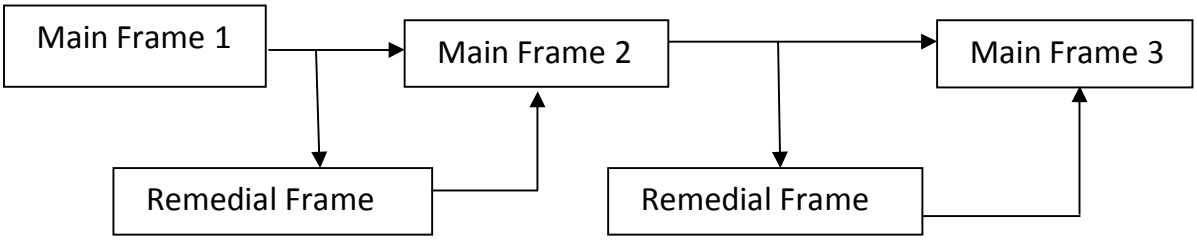
Branching programming is based on certain assumptions like needs of the learner, wholeness of content, meaningful units, multiple choice items, sufficient freedom etc. in order to make the content more effective and upto the understanding level of students. It follows two main techniques viz backward branching and forward branching technique

i. **Backward technique:-** In this technique, the learner goes through the same frame twice. Here the learner from frame no.1 of the main stream goes to frame no.2 only if he makes correct response. But if he makes wrong response, he has to go through a remedial frame where he learns why he make the error and then again goes to frame no.1 in order to respond correctly. The following diagram will clearly help us in understanding the procedure of backward technique.



Backward Technique

ii. **Forward Technique** :- In this technique, whether a learner makes a correct or wrong response, he always proceeds towards the new frame. On making wrong response, he goes through a remedial frame where in his mistake is fully explained. He then proceeds to the next frame without moving backward to the original frame. The following diagram will help us in understanding the procedure of forward technique.



Forward Technique

Branching programming may be produced in a book form called "scrambled text" because the pages do not follow the normal sequence as is found in our books, Journals, references etc. An illustration of such a programme type given by Noman A. Crowder himself is as follows:

On page 1 of the book the student finds the first unit of information and the first multiple choice question. Each of the alternative answer to the question is identified by a page number, e.g, the question on page I of the scrambled book may look like this.

In the multiplication 3x4=12, the number 12 is called product and the numbers 3x4 are called the

Page 15 quotients
Page 29 factors
Page 43 powers

The student chooses what he believes is the correct answer to the question and turns to the page number given in front of that answer. If he has chosen the correct answer, the page to which he turns will present the next unit of information or the next concept to be mastered and the next question. If he has choosen an incorrect answer, the page which he (thereby) turns will explain why his answer, was correct, and will direct him to return to the original choice page to try again. Thus the student cannot progress through the book except by eventually choosing the right answer to each question.

The example shown above is the first question in a scrambled book dealing with the structure of number systems, and the first topic to be developed in the book is the basic concept of exponent notation. The point of the first question is simply to establish whether the student is familiar with the use of the word "factor".

The correctional material that appears on one of the wrong answer pages, page 43, reads as follows."

Page 43

Your answer was, powers

We`ll get to powers of numbers pretty soon, but we`re not there yet. The numbers that are multiplied together to form a product called 'factors' not 'powers'. Now return to page (1) and choose the right answer." The student who has turned to page 43 will now presumably return to page 1, and choose the right answer, "page 29 factors" and turn to page 29.

The material on the right answer page corresponding to the first question confirms the correctness of the student`s choice and introduces the next topic.

"Page 29"

Your answer was "factors"

You are correct. The numbers which are multiplied together to form a product are called 'factors'.

(C): <u>Mathetics:-</u> Thomas F. Gilbert gave a formalized expression of his technology of education called Mathetics in 1962. The term "Mathetics" is derived from the Greek word, "Mathein" which means to learn. Here in this style of programmed learning, the main emphasis is on learner`s activities or his change of behavior rather than on the subject matter. Gilbert writes, "Mathetics is the systematic application of reinforcement theory to the analysis and reconstruction of those complex behavior repertoires which represent mastery of subject matter." Here each step is called an exercise. The size of exercise is as small as possible and the number of steps too is small. It is actually an extension of linear programming. It uses the methodology of operant conditioning theory of learning. The content is determined by stimulus response analysis of the subject matter.

In this programming, the mastery step is taught first and then by using retrogressive or backward chaining, e.g, a salesmen is taught the close a sale first. It involves three types of behaviors viz changing, discrimination and generalization. Here the entire procedure is demonstrated to the student and the mastery step is shown in the beginning.

Developing programmed instructional material

The development of programmed instructional material involves the following three phases.

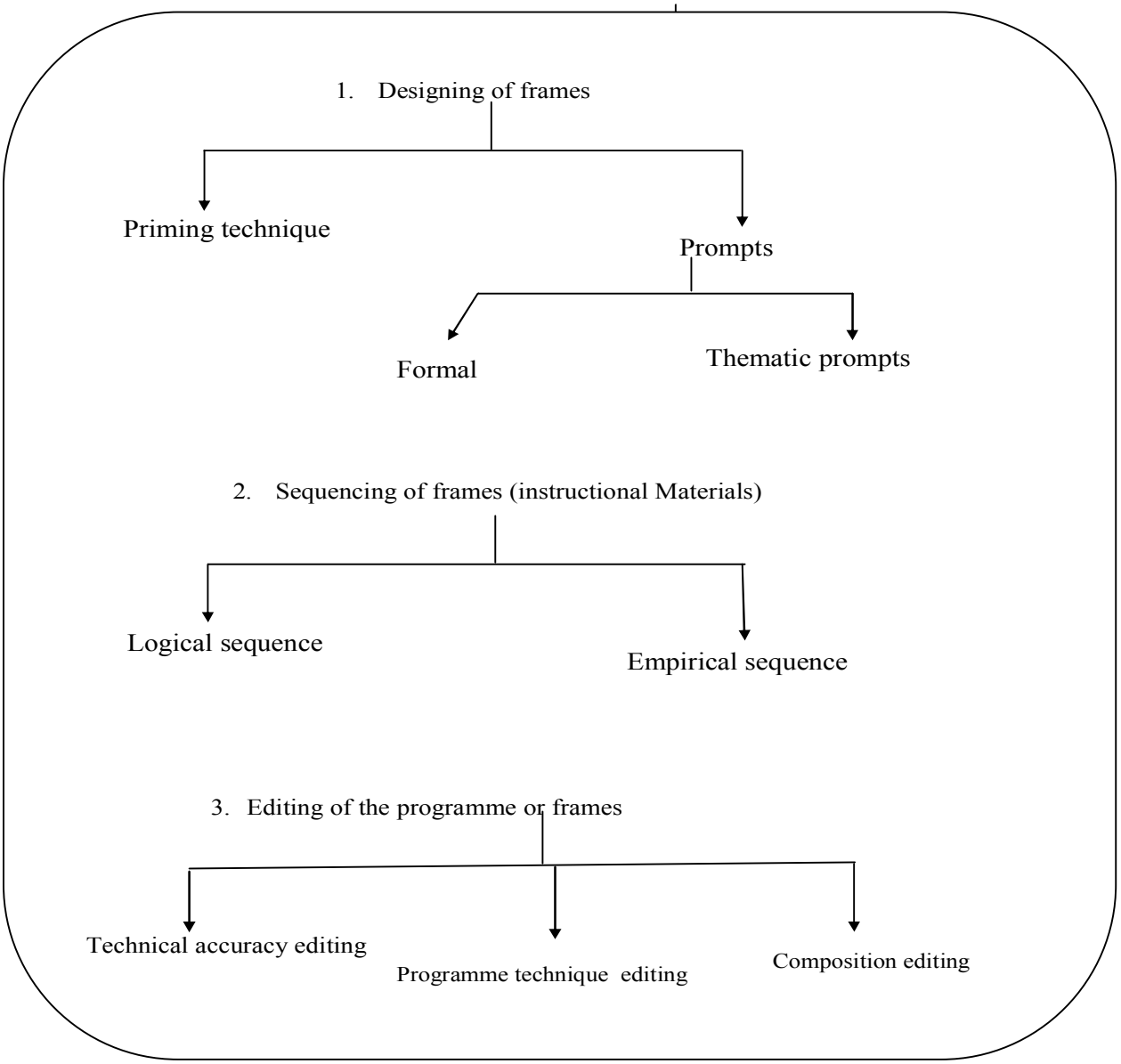
1. Preparation phase (preparation of the programme).
2. Developmental phase (writing of the programme).
3. Evaluative phase (testing and evaluation).

The following diagram will help us in understanding the procedure of developing the programmed instructional material.

A. Preparation

1. Selection of the unit to be programmed.
2. Writing assumptions about learners.
3. Writing objectives in behavioral terms.
4. Writing the entry behavior of the learners.
5. Developing specific outlines of content.
6. Preparing a criteria test.

B. Development Phase (writing of the programme)



C. Evaluative Phase

1. Individual try-out
2. Small group try-out
3. Field try out (classroom try-out)
4. Evaluation
   a. Internal criteria
   b. External criteria
5. Standard programme

Brief description of the three phases

A. Preparation Phase

This step is the crux of the success for developing a standard programme. In this phase, the instructor first selects a unit or content for programming. When he selects a particular content for the learners, he keeps in mind the individual differences of the learners i,e; he writes assumptions about learners. After knowing their potentialities and capabilities, he states clearly the type and extent of behavioural changes to be expected from the learners after going through the programme. He has to write entry behavior of the learners i.e, he has to describe clearly the initial behavior of the learners so that he should be quite definite and clear about the type of changes to be brought about in the behavior of the learner through programmed instruction. Now he thinks about the specific outlines of the content i.e; about the logical and systematic treatment of the subject based on the psychological requirements of the criteria test in order to ascertain the effectiveness of a programme by measuring the learners performance on clearly defined educational tasks.

B. **Developmental phase:-** It involves the actual writing of the programme whether in the form of linear, branching or mathetics form. The programmer while writing the programme takes the help from what is being done at the preparation phase. He designs the frames according to style of programming. In writing the frames, he makes use of certain special techniques like priming and prompting in order to help the learner to respond correctly and proceed successfully from one frame to another. After designing he gives a sequential or systematic order to different frames so that there may occur change in learners` behavior i,e; from entering to terminal behavior. After sequencing of frames, he now prepares first draft of programme for reviving and editing process.

C. **Evaluative Phase:-** This phase evaluates the edited programme by taking into consideration the different activities like individual try-out, small group try-out, field try-out and evaluation. When a programme has been developed, now it is administered to a few learners one by one only to check its effectiveness. He brings modifications in the programme and then administers it to a small group of individuals and then to actual classrooms or is administered to students. The results of field try-out are then thoroughly analysed through evaluation with the help of internal and external criteria in order to prepare a standard programme.

TEAM TEACHING

The concept of team teaching has its origin from America during the mid 1950. This technique was first developed by Harvard University by initiating an internship plan in 1955. In Britain, it was developed by J. Freeman. Francis chase of the university of Chicago used team teaching for effective teaching.

Meaning and Definitions:- Team teaching involves teachers who work in a team of three to six. It is an organization of teachers who work together in order to teach a particular subject or joining together to teach the same class. The following definitions will help us to understand the concept of team teaching.

i. **Carlo Oison:-** "An instructional situation where two or more teachers possessing complementary teaching skills cooperatively plan and implement the instruction from single group of students using flexible scheduling and group techniques to the part of the instruction of the same group of students."

ii. **David Warwick:-** **"**Team teaching is a form of an organisation in which individual teacher decides to pool resource, interests and expertise in order to devise and implement a scheme of work suitable for the needs of their pupils and the facilities of their schools."

From the above definitions, it can be concluded that team teaching is a form of organisation of teachers where they collectively use their skills, knowledge and expertise in order to make the content more effective and understandable. Here, the teachers co-operatively plan and evaluate the instructional material to be taught.

There are three types of team teaching viz, a team of teachers from a single department, a team of teachers from various departments of a single institution and a team of teachers from a single department of various institutions.

Characteristics:-

1. It involves two or more teachers to teach a class or a content.
2. It is based on co-operation. All the teachers plan and work co-operatively and utilize their abilities, experiences and resources in order to make the teaching effective.
3. It is an evaluation technique in which each teacher evaluates the other one`s in order to bring modifications in their mode of teaching.
4. It is an instructional strategy rather than training strategy.
5. Its plan is flexible. It may take a day or at least one hour and half.
6. It removes the isolation among teachers which have arisen due to certain misconceptions among teachers.
7. It develops the administrative and leadership qualities among teachers by giving them responsibilities and power in the management of school.

Procedure :-

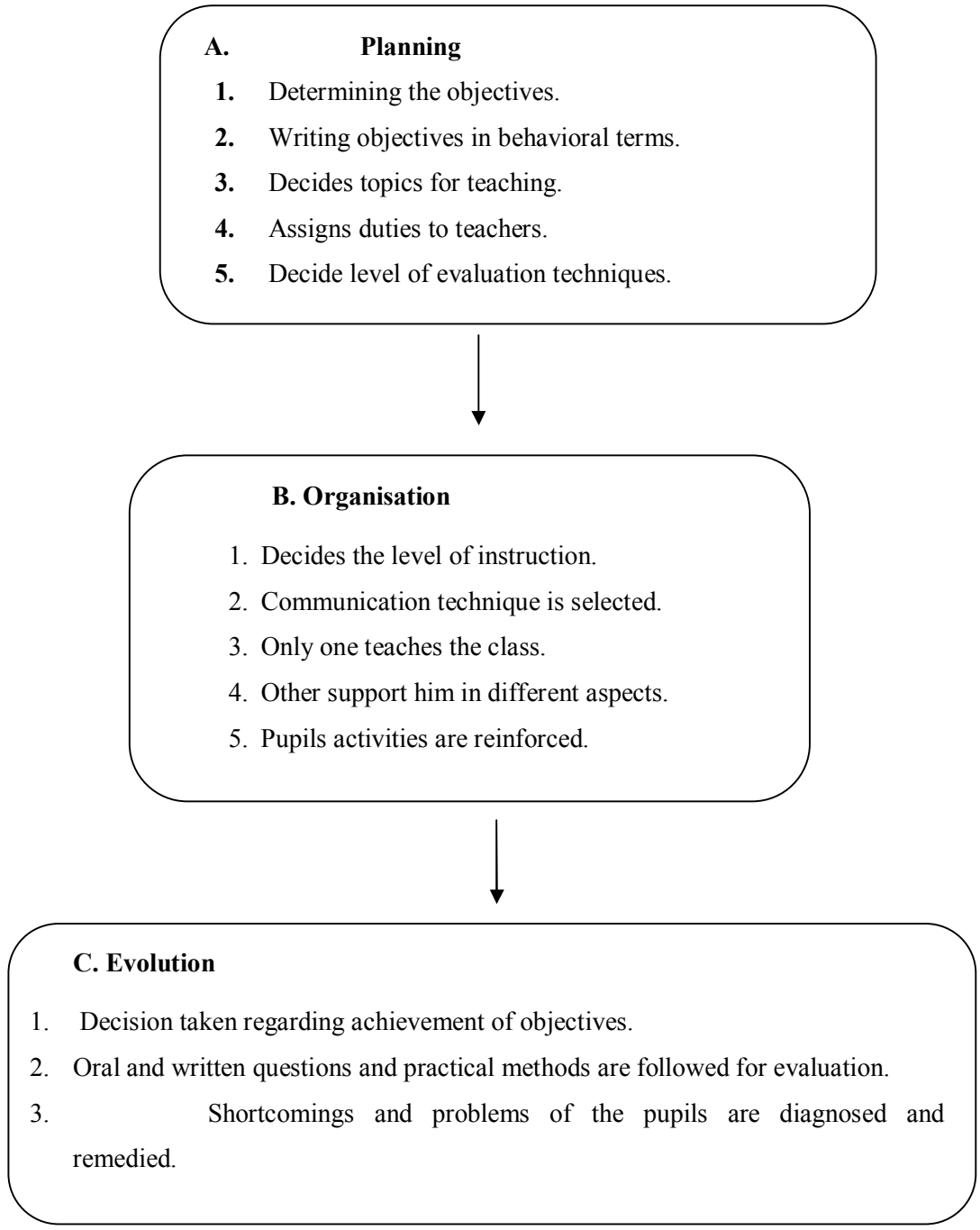
Team teaching involves three stages and are as:

i. **Planning:-** At the planning stage, the different members of the team meet together and discusses about the objectives of teaching, topic to be taught, assigns duties to teachers like leader-teacher, supervisor etc., selects appropriate audio-visual aids and equipments and decides about the evaluation whether oral or written questions or practical work should be used for evaluation.

ii. **Organization:-** At this stage, only one member of the team teaches the class and others note down the different points specifically which are difficult for the pupils to understand. The other teachers of the team also deliver lectures and clarify various aspects of the lesson. During these lectures, the pupils too perform some activities in the class.

iii. **Evaluation:-** At this stage, different tools and techniques are used to evaluate the performance of the pupils and achievement of objectives. The shortcomings and problems of the pupils are diagnosed and remedied.

The three stages of team teaching are diagrammatically represented as



BLOOM`S TAXONOMY OF INSTRUCTIONAL OBJECTIVES

Before discussing the Bloom`s Taxonomy of instructional objectives, we have to understand what object is. According to Robert Mager, "an objective is a collection of words which describe a desired outcome of a course. It is an intent communicated by a statement describing a proposed change in a learner, a statement of which the learner will be able to demonstrate at the time the instructor's programmer's influence over the learner ends. It is a specification of intended learning outcome, i.e; terminal behavior denoting any measurable and observable attributes

only." It indicates that objective is a statement or a form of category which suggests any kind of desired change. It measures and controls the behavior of learners. For example if we ask a science teacher, what are the objectives of teaching science, his reply may be to develop scientific temper among students, to create an interest in the subject, to aware them about different facts etc. such a statement is called objective. Usually objectives are of general and specific in nature. The educational objectives imply the changes that we try to produce in the learner. According to B.S. Bloom, "Educational objectives are not only the goals towards which the curriculum is shaped and towards which instruction is guided but they are also the goals that provide the detailed specification for the construction and use of evaluative techniques". They are broad philosophical in nature and can be achieved within a long period of duration i.e, from primary to university level of education, e.g; to develop the feeling of national or emotional integration.

According to Robert Mager, "An instructional objective is an intent communicated by a statement describing a proposed change in learner." These are specific, narrow and psychological in nature. They can be achieved within a very short period of class-room teaching. Instructional objectives are a part of educational objectives. e.g; acquisition of knowledge about the utility of national or emotional integration. Classroom teaching – learning objectives also called as instructional objectives are definite, precise, clear and functional. They are the desired learning or teaching outcomes. For example while teaching the topic "Sound" in science, its instructional objectives include:-

I. ***Knowledge:-*** To enable the learner to recall the meaning of sound producing things.
II. ***Comprehension:-*** To enable the learner to explain the topic.
III. ***Application:-*** To enable learner to make use of the concepts learned.
IV. ***Skill:-*** To enable the learner to make the sense of understanding of sound producing objects. So the instructional objectives are related to the particular classroom teaching. Thus there are different instructional objectives of different subjects or contents.

Taxonomy of Instructional objectives:-

Taxonomy means systematic, lawful or orderly arrangement. The systematic classification under which the objectives of instruction are placed is called taxonomy of instructional objectives. B.S. Bloom (1956) has classified the instructional objectives into three categories.

1. Cognitive objectives (knowing).
2. Affective objectives (feeling).
3. Psychomotor objectives (doing).

A: Cognitive objectives:- In cognitive domain, the main emphasis is on to develop the intellectual abilities and skills of the learners. It deals with the knowledge, recall and recognition. It includes the following six categories arranged in a systematic order ranging from lowest to the highest level of functioning.

1. ***Knowledge:-*** It is the lowest level of the objectives belonging to the cognitive domain. It means the remembering of previously learned material. It involves the recall of specifies and universals, the recall of methods and processes, or the recall of a pattern, structure or setting. For measurement purposes, the recall situation involves more than bringing to mind the appropriate material. It is the base of all other objectives included under Bloom`s classification. untill and unless an individual is not knowing anything about specifics, universals or settings, he will not be in a position to perform the ability of comprehension, application, analyses, synthesis and evaluation. Knowledge category acts as petrol which drives the mental engine to perform all the operations. For example the knowledge of different research methods helps us to evaluate the different educational as well as social problems. It includes the following sub- categories.
    a. Knowledge of specifics.
        i. Knowledge of terminology.
        ii. Knowledge of specific facts.
    b. Knowledge of ways and means of dealing with specifics.
        i. Knowledge of conventions.
        ii. Knowledge of trends and sequences.
        iii. Knowledge of classifications and categories.
        iv. Knowledge of criteria.
        v. Knowledge of methodology.

    c. Knowledge of universals and abstractions in a field.
        i. Knowledge of principles and generalizations.
        ii. Knowledge of theories and structures.

2. Comprehension:-

This represents the lowest level of understanding. It is the ability to grasp the meaning of the material and translate it from one form to another (numbers to words) by interpreting material (explaining or summarizing) and by estimating future trends. It is based upon the remembering of previously learned material. If there is no previously learned material, there will be no comprehension. It develops the essential competencies for generalizations, insight and solving the problems. It stresses upon the mastery of the material being communicated to the individual. It includes the three types of activities. For comprehension, knowledge is pre-requisite .It includes

a) Translation
b) Interpretation.
c) Extrapolation.

3. Application:-

It refers to the ability to use learned material in new and concrete situations. It includes the application of such things as rules, methods, concepts, laws and theories. It requires the knowledge and comprehension for its working. It requires a higher level of understanding than those under comprehension. It develops the predictive ability of an individual. For example the application of operant conditioning theory in the teaching – learning process or use of trait theory to develop a balanced personality. When we have provided students the desired knowledge regarding the operant conditioning theory, they remember it and recall it. After remembering the knowledge of this theory, they grasp the meaning of the material or the different concepts like conditioning, reinforcement, stimuli, response etc and they use or apply these terms or generalizations in order to solve the problems of the learners. This category includes the following three levels.

i. Make generalization of facts, principles and theories.
ii. Diagnosis the weakness of these contents.
iii. Apply or usage of these contents or terms and laws by the pupil.

4. Analysis:-

It refers to the ability to breakdown material or instructional process into its constituent elements or parts such that the relative hierarchy of ideas is made clear and the relations between the ideas expressed are made explicit. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material. It includes the division of contents into its elements and their mutual relations. For example the division or breaking down the mechanism of reinforcement theory into constituent elements or parts such as shaping, chaining, generalization, extinction etc. It includes the following three categories.

i. Analysis of elements of communication.
ii. Analysis of relationships.
iii. Analysis of organizational principles.

The ability to recognize form and pattern in literary or artistic works as a means of understanding, their meaning. It develops the reasoning ability of the learners.

5. Synthesis:- It refers to the ability to put parts or elements together to form a new whole. It involves the creative behaviors of an individual with major emphasis on the formulation of new patterns or structures. For example the first computer appeared before us was so large that it was set at a particular place like a building and today we see the minicomputers only due to the reshaping of structures or parts to form a new pattern or due to the creative ability. It includes the following three categories.

a. Production of a unique communication.
b. Production of a plan or proposed set of operations.
c. Derivation of a set of abstract relations.

6. Evaluation:- It is concerned with the ability to judge the value of material (statement, novel, poem, research paper) for a given purpose. It represents the highest level of the cognitive domain and involves all the five categories described earlier. The judgments regarding the material are based on definite criteria viz both internal as well as external criteria. It has two levels.

i. Judgment in terms of internal evidence.
ii. Judgment interms of external evidence.

It includes the comparison of major theories, generalization and facts about particular cultures. It develops the power of judgment about both qualitative as well as quantitative material.

B) Affective domain:- In affective domain the main emphasis is on non-cognitive dispositions such as attitudes, interests, emotions, mental tendencies and values of the pupils. Krathwohl and his associates assumed that the pattern involved in acquiring values moves from a very low level of awareness towards the highest level of

internalization. At the lowest of the affective taxonomy is receiving and at the higest level is characterization. Bloom, Krathewohl and Masia (1964) have classified affective domain into five categories as follows:-

1. Receiving (attending):- Receiving or attending refers to the student's willingness to attend to a particular phenomena or stimuli (classroom activities, textbook, music etc). Recall of material or remembering of material is directly related to attending. Unless an individual will not be willing towards any activity, he will not able to remember anything or recall anything. It is the first step in order to make learners learn and teachers to teach something. It is directly concerned with the sensitivity of the pupils which occurs in the presence of some activity or stimulus. It includes the inculcation of certain interests, attitudes, values or the ideas. For example development of consciousness of colour, form, arrangement and design in the objects and structures around him and in descriptive or symbolic representations of people, things and situations. It includes the following three sub-categories:-

I. Awareness.
II. Willingness to receive.
III. Controlled or selected attention.

Receiving or attending has three sub-categories to indicate three different levels of attending to phenomena. First we get aware about different phenomena without specifications or discriminations, then we shows our willingness to receive those phenomena and at last we control our attention towards the favored stimuli.

2. Responding:- It refers to the active participation on the part of the student. At this level, he not only attends to a particular phenomena but also reacts to it in some way. Once a learner receives or attends to a particular idea, event or thing he must be made to respond to it as actively as possible which is manifested in the active behavior like obeying, answering, reading, discussing, recording, writing and reacting to a phenomena. Here the learner completes his assigned home work, obeys school rules and participates in class discussions. It includes the following sub-categories.

1. Obedience for responding.
2. Willingness to respond.
3. Satisfaction in response.

In this category, obedience or compliance involves the students response to a stimulus but he is not fully satisfied or does not feel it necessary to do. For example he obeys the play ground regulations and does not shows interest or willingness to obey them. When he obeys the certain rules or regulations he should show willingness to respond them not by means of punishment but by his own willingness. After that he gets satisfaction or pleasure in responding to different phenomena.

3. Valuing:- It is concerned with the worth or value a student attaches to a particular object, phenomena or behavior. Here the learner demonstrates problem solving attitude, commitment to social improvement, appreciates the role of different subjects in everyday life, appreciates good literature (art or music) and believes in the democratic process. It includes the following categories:-

i. Acceptance of a value.
ii. Preference for a value.
iii. Commitment (devotion) to a value.

This instructional objective cannot be achieved without receiving and responding. First the individuals accept different values on the basis of beliefs or as a doctrine. He then deliberately examines a variety of view points on controversial issues with a view to forming opinions about them. Lastly he is committed or devoted to the value and his commitment to the underlying value guides his behaviors, e.g; devotion to those ideas and ideals which are the foundations of democracy.

4. Organization:- It is concerned with building a value system. Here the learner organizes the different values, ideas and ideals into a system and that system governs him and his life. Here emphasis is on comparing, relating and synthesizing values. Each learner now assumes the responsibility for improving human relations or with the organization of a value system. Ultimately this category of objectives leads to the development of a philosophy of life. He recognizes the role of systematic planning in solving problems, understands and accepts his own strength and limitations and formulates a life plan in harmony with his abilities, interests and beliefs. It includes the following sub-categories.

I. Conceptualization of a value.
II. Organization of a value system.

Receiving, responding and valuing are the pre-requisites for the organization category. As the learner successively internalizes value, he encounters situations for which more than one value is relevant. The learner throughout life organizes different values, determines the interrelationship among values and then establishes a dominant and pervasive value system, which is built gradually, which guides him in order to accept the responsibility for his own behavior, e.g; develops a plan for regulating his rest life in accordance with the demands of his activities.

4. Characterization by a value or value complex:- It is that level in which the consistency in the hierarchy of values of the pupil occurs. The individual develops a character life style which helps him to develop a balanced personality. His behaviors at this stage are pervasive, consistent and predictable. He uses objective approach, practices cooperation in group activities, shows self discipline and displays safety consciousness. At this level, he acts consistently in accordance with the values he has internalized. He is ready to revise judgments and to change behavior in the light of the evidences. It is characterized by following two sub-categories.

I. Generalized set.
II. Characterization.

In this category, the individual acts consistently in accordance with values they have previously accepted. Its main objective is to develop a total philosophy or world view.

C. Psychomotor domain:- In psycho-motor or conative domain, the main emphasis is to train the physical as well as motor skills of the students. E.J. Simpson (1966) divided the psycho-motor domain into the following categories.:

1. Perception :- The first step in performing the different activities involves sense organs. He becomes aware about different objects, qualities or relations through the five sense organs. It includes three levels.

I. Descriptive level.
II. Condition of transition level.
III. Interpretive level.

2. Set:- It means a preparatory adjustment for a particular kind of action of experience. It involves three levels.

I. Mental level.
II. Physical level.
III. Emotional level

3. Guided Response:- It is the initial stage in the development of motor skill. It is the behavior shown by the individual under the guidance of another person. Abilities relating to complex skills are stressed in the guided response.

4. Mechanism:- At this level, the learners develop self-confidence and skills to perform an act. It is the condition which helps the students for responding properly. It is also called confident action.

5. Complex overt response:- At this stage, the learners acquire so much confidence and skill that they accomplish the most complex tasks with minimum energy and time.

Two more systems of classifications of psycho-motor objectives includes that of Dave (1977) and of Harrow (1972).

Dave`s categories includes imitation, manipulation, precession, articulation and naturalization.

Harrow`s categories includes reflex movements, basic – fundamental movements, physical abilities, perceptual abilities and skilled movement.

General instructional objectives and behavioral terms for the cognitive domain of the taxonomy (Bloom):-

Instructional objectives	**Behavioral terms for stating specific learning outcomes.**
1. Knowledge	Define, Describe, Identify, Label, List, Matches, Names, Outlines, Selects, States.
2. Comprehension	Converts, Defends, Distinguishes, Explains, Generalizes, Gives Examples, Infers, Summarizes.
3. Application	Changes, Computes, Demonstrates, Discovers, Manipulates, Modifies, Operates, Predicts, Prepares, Produces, Solves, Uses.
4. Analysis	Breaks down, Diagrams, Differentiates, Identifies, Illustrates, Outlines, Selects, Separates, Subdivides.
5. Synthesis	Combines, Compiles, Composes, Creates, Devises, Designs, Generates, Rearranges, Reconstructs, Rewrites, Summarizes.
6. Evaluation	Concludes, Contrasts, Criticizes, Describes, Discriminates, Explains, Supports.

FORMULATION OF INSTRUCTIONAL OBJECTIVES (ROBERT MAGER)

Bloom`s taxonomy is a solid contribution to the teaching – learning process. But its main drawback is that it does not state objectives in behavioral terms or in terms of terminal behavior. It does not indicate how the behavior of the learners would be modified through the task of teaching – learning. Therefore, it is essential to write or

formulate these objectives in behavioral terms. There are many methods of writing objectives in behavioral terms like.

I. Robert Mager`s approach.
II. Robert Miller`s approach.
III. RCEM approach.

Robert Mager`s Approach:-

Robert Mager, a programmed instructor, concentrates on cognitive and affective objectives. According to him, the instructional objectives are best described interms of terminal behavior expected from the learners. He gives main emphasis on action verbs rather than on mental process. These verbs helps in describing the outcomes of learning or terminal behavior of the learner in a well defined way. He considers that clear objective should be formulated in the following manner.

1. Indentify the terminal behavior and name it.
2. Important conditions under which the behavior will be expected to occur be described.
3. Criteria be finalized with which the learner`s terminal behavior will be compared.

Mager made Bloom`s taxonomy as the basis for writing objectives in behavioral terms. He concentrates on cognitive and affective domain and neglected psycho-motor domain. Here below is given the list of action verbs.

a. List of associated action verbs for the cognitive domain:-

Objectives	Associated action verbs. Based on Bloom`s taxonomy.
1. Knowledge	Define, List, Label, Measure, Name, Recall. Recognize, Reproduce, Select, State, Write, Underline.
2. Comprehension	Change, classify, Distinguish, Explain, Identity, Illustrate, Indicate, Interpret, Justify, Judge, Name, Represent, Select, Summarize, Transform, Translate.
3. Application	Asses, Change, Choose, Conduct, Construct, Compute, Demonstrate, Discover, Explain, Establish, Select, Solve, Use.
4. Analysis	Analysis, Associate, Compare, Conclude, Contrast, Criticize, Differentiate, Identify, Justify, Point out, Resolve, Select, Separate.
5. Synthesis	Argue, Conclude, Combine, derive, Discuss, Generalize, Integrate, Prove, Precise, Relate, Restate, Synthesize.
6. Evaluation	Associate, Choose, Compare, Criticize, Conclude, Defend, Determine, Evaluate, Judge, Recognize, Relate, Select, Support, Verify.

b. Affective objective's Based on Bloom`s taxonomy associated action verbs:

Objectives	Associated action verbs. Based on Bloom`s taxonomy.
1. Receiving	Ask, Accepts, Attend, Catch, Discover, Experiment, Identify, Favour, Follow, Observe, Prefer, Perceive, Receive, Select.
2. Responding	Answer, Assists, Complete, Derive, Discuss, Develop, Help, List Label, Name, Obey, Purest, Practice, Record, Select, State, Write.
3. Valuing	Accept, Attain, Complete, Choose, Decided, Demonstrate, Discriminate, Develop, Increase, Indicate, Influence, Participate, Prefer, Recognize.
4. Organizing	Add associate, Change, Compare, Complete, Co-Coordinator, Correlate, Determine, Find, Form, Generalize, Integrate, Judge, Project, Prepare, Palate, Select, Synthesize, Organize.
5. Characterizing	Accept, Change, Characterize, Decide, Discriminate, Demonstrate, Develop, Experiment, Face, Identity, Judge, Prove, Revise, Serve, Solve, Verify.

The objectives can be written in behavioral terms by combining the action verbs with the element of content. A few examples are:

Example 1: Subject : Mathematics, Topic: Areas of rectangle

Instructional objectives (cognitive domain)	Objective in behavior terms
1. Knowledge	The learners are able to reproduce the formula for finding out the area of a rectangle.
2. Comprehension	The learners are able to explain for prove the formula for finding out the area of rectangle.
3. Application	The learners are able to apply the area of rectangle in some other situation.

Example 2: Subject: Education, Topic: Duties of a pupil – teacher

Instructional objectives (Affective domain)	Objectives in behavioral terms
Receiving	The learners accept their duties as pupil – teachers.
Responding	The learners are able to state the duties of pupil teachers.
Valuing	The learners are able to indicate the duties of a pupil teachers.

MEANING AND SIGNIFICANCE OF LESSON PLANNING

Planning means thinking about something beforehand. The success of any work is ensured if its works is planned properly without planning we cannot achieve our desired ends. Lesson planning means the planning of a daily lesson related with a particular unit of a subject to be covered by the teacher in a specified period for the realization of some stipulated instructional objectives. The development of the lesson planning occurred as a result of Gestalt psychology. According to Gestalt psychology, we perceive whole and then analyze it into different parts. In other words, the emphasis in on unit teaching. A unit, thus plays an important role in understanding the whole concept. Gestalt divides unit lesson plan into two ways viz, Herbart`s Approach" and "Dewey and Kilpatric Approach".

Meaning of lesson planning:- Lesson plan is that small unit or units of subject – matter which a teacher teaches in a definite period. We can understand the meaning of lesson planning with the help of following definitions:-

i. **Binning and Binning:- "**Daily lesson planning involves defining the objectives, selecting and arranging subject – matter and determining the method or procedure."

ii. **Bossing:-** "Lesson plan is the title given to the statement of the achievements to be realized and the specific means by which these are attained as a result of activities engaged during the period."

iii. **C.V. Good:-** A lesson plan is, "A teaching outline of the important points of lesson arranged in order in which they are to be presented. It may include objectives, points to be made, questions to be asked, references to materials, assignments etc."

While concluding we can say that lesson plan is that pre-determined plan according to which the teacher presents the unit or units of the content regarding new knowledge or experiences by appropriate methods, strategies, tactics, techniques and instruments before the pupils in a particular period, in order to achieve the objectives of the lesson. It is the heart of effective teaching.

Types of lessons:- There are three types of lessons according to their mental activities and are:-

1. **Knowledge lessons:-** In these lessons, the cognitive aspect is kept in view. Here pupils acquire the knowledge of various facts and events through the knowledge lessons.
2. **Appreciation lesson:-** In these lessons, the affective aspect is kept in view. The lessons of music and arts are said to be appreciation lessons.
3. **Skill lessons:-** In these lessons, the conative or psycho- motor domain is kept in view. The creative power of the pupils is more active in these lessons. Painting, handicrafts, gardening, agriculture etc. come under the skill lessons.

Significance of lesson planning:-

1. Lesson – planning helps us to achieve the pre- determined and well defined objectives of the lesson.
2. It helps us to make wise selection of different methods and techniques in order to carry out teaching systematically so that it becomes effective and fruitful.
3. It develops confidence and self- reliance in the teacher which is of great value for successful teaching.
4. It brings economy in the teaching – learning process by keeping both the teacher and pupils on right track and there is no wastage of time and energy.
5. It develops the habit of hardworking among teachers by daily planning of the lesson.

6. It helps a teacher to make use of the principle of correlation and integration by linking new knowledge with previous knowledge, linking theory with its practical aspects etc.
7. It helps the teacher to prepare tests for progress and to evaluate the teaching – learning process.
8. It helps the teacher to use and practice essential component behaviors and skills of teaching helpful in the realization of educational objectives.
9. It helps a teacher in developing his decision making ability, teaching competency and teaching effectiveness.
10. It provides adequate lesson summaries and ensures a definite assignment for class which helps in developing insight and understanding.
11. It helps the teacher as well as taught in fixing the new learning by making adequate provision for revision, practice, drill work and home assignments.
12. It helps the teacher to become aware of what, when and how much is to be done in the class. It engages pupils in their respective tasks and results into class- room discipline.
13. It gives practical shape to the teaching – learning process.

HERBARTIAN APPROACH

The Herbart`s approach generally develops the cognitive aspect of the learners. This approach is generally called as "Herbartian Five Steps Approach". It is propagated by G.F. Herbart, an European educationist and philosopher of the nineteenth century. He advocated four things for successful teaching viz interest, apperception, general method and correlation. For successful and effective teaching, the teacher should first create interest among learners, towards the subject matter. He suggested the following five steps:-

1. ***Preparation (Introduction):-*** This step is also called as introductory stage or motivation stage or creating a "will to learn" stage. Here the teacher prepares the minds of the learners in order to receive the new knowledge. The teacher performs different activities like asks questions, uses narrations etc. only to prepare their minds or to create interest among learners to become receptive for further learning. George H. Green says in his book 'Planning the lesson' in the preparation step, the teacher brings well into the pupils mind the knowledge to be gained in the course of the lesson. In the preparation step nothing new is learned. The relevant old knowledge is marshaled and the pupil is made ready to receive the new. Once they are motivated and prepared mentally for studying the lesson, the half teaching is considered to be completed. Here he introduce the lesson by taking care of the general and specific aims of the lesson, use of aids, previous knowledge testing and announcement of the topic.
2. ***Presentation:-*** After motivating the students, the teacher now presents the learning material before the students. While presenting the subject matter, the teacher uses different strategies like narration, question – answer method, audio – visual aids etc. in order to make his teaching an interesting activity. The learners are fully involved in the lesson and they does not remain passive even for a movement. He represents the material in psychological and logical sequence keeping in view their individual differences. He never allows the teaching process to become just one sided affair.
3. ***Comparison and Association:-*** Here the teacher tries to compare and associate the newly learned matter with the one already learnt. Association means to link new knowledge with the old and with one another into a system. No doubt newly learned material remains for the time being but soon it vanishes from the mind. When the teacher presents the materials, he asks them to compare it with another material and it helps them to retain the material for long time. Comparism and association removes doubts and confusions of the students. For example the teacher may ask them to compare psychology and educational psychology or to compare diesel engine with petrol engine and associate it with the old knowledge. It strengthens their acquisition of new learning material. Therefore, the teacher should try to use the method of comparism and association.
4. ***Generalization:-*** Comparison and association helps the children to found out certain conclusions which enables them to form general laws, principles or formula. It means arriving at a certain conclusion on the basis of comparison, contrast and associations observed in the learning material. The teacher should provide ample opportunities to learners in order to derive themselves some conclusions. This step involves the reflective thinking because knowledge acquired in presentation is systematized and that leads to generalization. Sometimes the students may make incorrect generalizations, at that time, the teacher helps and guides them in order to correct those. The important thing here is that the pupils should clearly understand the laws that they have discovered.

5. ***Application:-*** Knowledge that has no utility or applications vanishes soon from the mind and that knowledge remains for long time which is applicable. The learners after deriving some rules, principles or laws then applies them to different situations and hence gets more and more knowledge. By application the new facts get established in the mind of the pupil and becomes a part of his mental make- up. This step tests the validity of the generalization arrived at by the pupils. For application purpose, both familiar and unfamiliar situations should be provided to the learners. The more the application of the subject matter, the greater is the learning. Thus we can say that practice, recapitulation, previous knowledge testing and home assignments are all ways of application.

Gloverian Approach:- (Alternative Scheme):-

A.H.T. Glover in his book, "New teaching for New Age", recommends an alternative scheme for writing lesson plan due to the following reasons by criticizing the Herbart`s approach:

1. He said that Herbartian approach is teacher centered while modern education emphasis on child centered education.
2. It is wrong to consider association and comparison a separate step of his approach. The reality is that this step is a part of presentation step.
3. It is difficult to draw generalizations as advocated by Herbart because establishing general facts needs long and difficult efforts.
4. If at all suitable, the Herbertian pattern is suited to the verbal child and the academic subjects.

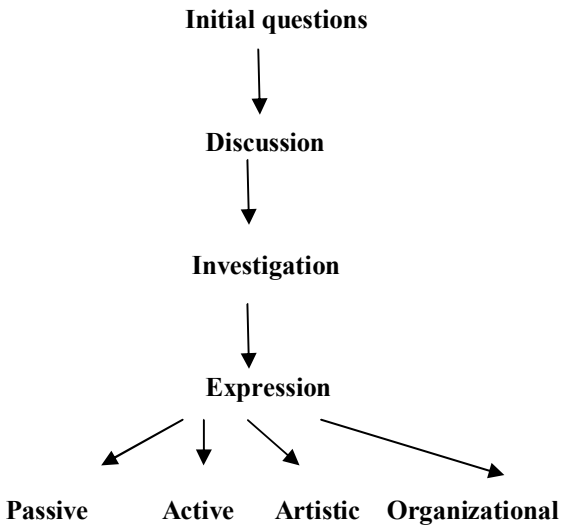
Alternative Scheme:-The steps included under alternative scheme are as :-

i. **Questioning:-** In this scheme, the topic or content is presented with the help of questions. The questions which the teacher asks them may be of introductory, developing and recapitulatory. Questions in the beginning of the lesson are asked to test their pervious knowledge, to activate their minds so that they become receptive for further leaning.

ii. **Discussion:-** Questioning is followed by discussion regarding the different opinions towards introductory questions. Discussion occurs between the teacher and the pupils. The children express their ideas and opinions and it help them to remove their confusions and difficulties. The teacher may divide the class into groups in order to make it more interesting and fruitful.

iii. **Investigation:-** The discussion raises different problems which need solution. So the student may investigate individually or collectively in order to solve those problems. The teacher guides them in the investigation process and provides them necessary information related to the problem.

iv. **Expression:-** After investing the problem, the students are now in a position to use that learnt material in different situations. In other words, they are able to express themselves fully. Expression may be of writing something which may be visual or concrete. The expression should be in the form of practical activities which are of four categories. (i) Passive (II) Active (III) Artistic or recreational (iv) organizational.



Diagramic representation of Gloverian approach.

Appreciation Lesson

As we know the lessons are of three types viz knowledge lessons, skill lessons and appreciation lessons. The first two deals with coginitive and psycho- motor domain while appreciation lessons deal with affective domain i.e, feeling aspect of an individual. These lessons are concerned with emotional aspect of pupils. Their main aim is to develop aesthetic sense of the pupils. They enjoy beauty through colour, form or sound i.e; painting, sculpture, poetry, drama etc. The teacher must provide maximum freedom to them in order to create simple forms of beauty. The main steps involved in an appreciation lesson are as:-

i. ***Preparation:-*** The sucess of appreciation lesson depends on preparation stage. The teacher creates an appropriate atmosphere in order to achieve success in appreciation lesson. He motivates the learners for enjoyment and provides all the suitable materials necessary for a lesson. The teacher selects the content keeping in view their individual differences.

ii. **Presentation:**- After selecting the content for presentation, the teacher presents it before the pupil. He should use all the devices necessary for the lesson. He should put himself into the author`s place on one hand and into pupils place on the other. As Wilkes has said, " an appreciation lesson is not to be treated as knowledge lesson. There cannot be any forced appreciation. It is subjective through his able presentation of the material, he is to create such a situation that child is led to appreciate and enjoy." For literature teacher should have the ability to read well, for music the ability to play or sing. The appreciation lesson should be presented in whole form and not in parts.

iii. **Contemplation:**- After presentation a brief pause should be allowed so that the children feel, think and contemplate on the material presented. It involves creative thinking. They feel and think about the object of beauty. Analysis should be avoided. It helps the pupils in locating the points of beauty.

iv. ***Practice and creation or application:-*** Appreciation lessons involves creative exercises, so they should see its immediate applications. They should be in a position to compare a poem, to write poetry, to draw a picture. Smith and Harrison in their book, "The principles of class teaching" write that at this stage "the child passes from enjoyment to action, he tries to write in imitation of an author who had made a vivid appeal". Attempts should be made to encourage the students to create articles of beauty. Although they may prove to be below standard but these things have great educational significance.

Method is the instrument in the hands of a teacher through which a complex subject matter can be easily understood by any learner.

PLAY-WAY METHOD

Play is an innate, creative, joyful, non-serious, interesting and recreative activity. It is the activity in which natural urges of the child find spontaneous expression. It is regarded as the language of the child. What he cannot express through language, he expresses that through his behaviour and that behaviour is play. According to Froebel, "Education is a development from which man's life broadens until it has related itself to nature, until it enters sympathetically into all activities of society, until it participates in the achievements of the race and aspirations of humanity. It is a process of unfolding child`s innate powers and to awaken his spiritual nature which may enable him to realize his inner unity, achievements of race and aspirations of humanity. He clearly emphasized on natural release of the child's physical and mental powers through which he will develop a balanced personality. As he said, "play is the highest phase of child development and the source of all that is good."

All the educationists made efforts in order to bring play into the field of education. The Play-way was first used as a method of teaching by Cadwell Cook. This was first used for teaching the different play`s of Shakespeare by Cook. He noticed that they took more interest in those plays where they themselves were involved in the activity. He said, "good work is more often the result of spontaneous effort and free interest than of compulsion and forced application. Effectiveness of learning lies not in reading and listening, but in action, performance and experience". He further said, "the core of my faith is that only work worth doing in play; by play I mean doing anything with one's heart in it. Only that child learns best who learns with interest and with a purpose and sees significance in what he does."

Definitions:

a. ***Ross:*** "Play is joyful, spontaneous and creative activity in which man finds fullest self-expression."
b. ***Thomson:*** "Play is impulse to carry out certain instinctive actions."
c. ***Crow and Crow:*** "Play is the activity in which a person engages himself when he is free to do what he wants to do."
d. ***Froebel:*** "Play is the highest phase of child development and the source of all that is good."

Principles of play-way methods:

The following are the underlying principles of play-way method:

a. ***Learning by Doing:*** Training of five senses makes all round development in an individual. The principle of learning by doing involves maximum usage of these senses. Any knowledge which a child gains through his head and hands becomes interesting and purposeful for him. The children experiment and discover themselves the required knowledge by means of play-way method.
b. ***Principle of individual differences:*** The play-way method takes into account the individual differences of the learners. Every individual works according to his differences in different spheres like interests, attitudes, sentiments, capabilities, intelligence level etc. It makes the learning easy and understandable by involving every learner according to his differences.
c. ***Sympathetic Attitude:*** Play-way method develops a congenial environment in teaching-learning process. It does not create artificial environment or any compulsion on the learners. Everyone is free to do and act according to his interests. Whenever children need suggestions, they accept them without any hesitation.

Procedure:

When we review all the progressive methods of teaching, we find that they contain the principles of play. All the progressive methods viz. Kindergarten, didactic method, project method, Dalton plan involves the procedure which is of play-way in nature. For example the Dalton plan follows the procedure like assignments or contracts, subject teacher, subject rooms, records, conferences, time budgeting and daily time schedule; involves the play-way principles in each step. Every activity is done according to the capabilities, needs and interests of the learners. They are at liberty to move from one room to another according to their wishes. So, all the progressive methods follow the play-way procedure in their completion.

Practical applications of play-way method in progressive methods of teaching:

1. ***Kindergarten Method:*** Kindergarten means 'garden of children'. In this method, children are provided with seven gifts called apparatus in order to develop the different ideas like shape, colour, number, weight etc. Children learn while playing and singing in a happy atmosphere of kindergarten. It is based upon the play urge of the children. Every activity is designed according to their interests.
2. ***Didactic Method:*** This method was developed by Maria Montessori. It provides sense training to the individuals, because senses are the gateways of knowledge. In it, the children enjoy, play and learn.
3. ***Project Method:*** As a method of teaching, it was used by J.A. Stevenson. In it the children choose their projects according to their interests, urges and capabilities and complete their projects only when they follow certain psychological principles of learning like law of readiness, law of effect etc. they learn in real life situations which becomes significant for them.
4. ***Dalton Plan:*** This method was devised by Miss Helen in Dalton USA. In it, complete freedom is given to children to complete their school work according to their interests and capacity.
5. ***Heuristic Method:*** This method was devised by Prof. Armstrong. In it, the children discover things themselves. He experiments and finds out different principles or rules for himself. The child struggles to find out conclusions for an investigation which he chooses voluntarily and happily.

Play-way in teaching different subjects:-

a. ***Languages:*** Play-way method helps the children to acquire the free use of language. Debates, discussions, tutorials, class-meetings, school assembalies provides sufficient opportunities for expressing one's ideas thus help in acquiring control over the use of languages in different situations. Even pronunciation can be well taught in play-way spirit. The little children recite nursery rhymes in a singing manner even if they do not understand its meaning. So play-way method is very effective and significant at elementary level in order to make the use of language in different situations.
b. ***Mathematics:*** Different mathematical operations like addition, subtraction, multiplication and division can be taught through play-way method. Counting and simple calculations can be taught by organizing projects like running a shop, managing a post-office, opening a co-operative store etc.

c. ***Social studies:*** It can be taught through dramatics, stamp collecting, drawing of maps, graphs, charts, pictures, globe-making, models, historical and cultural excursions and tours.
d. ***Science:*** Science can be best taught through play-way method. Different experiments, collection of specimens, manufactured articles, minerals, preparation of charts, models and graphs, photography, soap-making, chalk making, preparation of squashes, jams etc. can be best taught through play-way spirit. Children love to make things for themselves so they should be given ample opportunities for activity and play.

DALTON PLAN

The Dalton plan or the Dalton laboratory plan as it is sometimes called was originated and planned by Miss Helen Parkhurst in a high school at Dalton in USA in 1920. She was a school teacher and incharge of teaching children of different classes with different ages and with different achievements. She found that the traditional teaching ignores the individual differences of the learners. In traditional system, the teacher comes into the class, delivers his lecture without caring about their individual differences. All the children whether bright or dull were tagged together and as such it do not benefit the average classroom. She had studied the different methods and thought of a similar plan whose base should be the individual differences and thus evolved her own plan namely Dalton plan. It is not a method but a reorganization of educational scheme applicable to 8 to 18 years of age. There is no change in the curriculum but change in the teaching procedure. It gives more importance to individual, his nature, needs, interests etc. Thus it provides equal opportunities of progress to all the learners.

Principles:

1. ***Principle of individual differences:*** The whole crux of this plan is based on individual differences. No two individuals are alike in any respect so everyone should be given freedom to experiment and to manipulate the learning situations according to his needs. In this plan, every child works according to his own needs and interests. No restrictions or compulsions on the learner in order to complete their assignments.
2. ***Principle of Freedom:*** This plan follows the principle of freedom. As we are facing the situations of ringing bells in the schools, this plan had ignored it only to give students freedom in their studies. No one is there to knock the door that your period is complete. There is no set time-table, no classroom restrictions, and no worry of annual examinations. They can move freely to any room according to their time budgeting.
3. ***Principle of Self-Effort:*** This plan takes into account the individuals self-effort in any assignment or work in order to develop individual in all aspects. Spoon-feeding has been totally avoided in this plan. Whatever, he learns and how he learns depends upon students self-efforts. It makes him hard-worker, develops confidence and instills spirit for further learning.
4. ***Principle of Gestalt view of Work:*** This plan gives the whole view of the work to be done by the learners in a year. No doubt that is split into parts, but the wholeness reminds them that how much work they have to done in a year.

Features and procedure of Dalton Plan:

1. ***Assignments or Contracts:*** As the session starts in those schools were this scheme is applied or may be applied, the respective subject teachers plan the detailed outlines of their syllabi. The syllabus of each subject is divided into monthly units or assignments. While dividing the syllabus into monthly units, the teachers keep in mind the different factors such as time available, holidays, revision at various stages, co-curricular activities and the demands of other subjects. Each assignment has complete directions and references for study. Whatever material a student needs during his completion of the assignment is provided to the learners. The students have to complete all the monthly assignments of various subjects before he is allowed to have the next assignment in any subject. They are free to move to any laboratory, library and to use the illustrative material in order to complete their work. The students are expected to work on assignments in different subjects simultaneously. They may complete assignment in one subject and then proceed to other subjects according to their demands.
2. ***Subject teachers***: Like our schools, there are class teachers but in Dalton plan these are called as subject teachers because everyone is specialized in his respective field. His main duty is to prepare their assignments, check their work, record their progress, guide them whenever they feel difficulty. He gives them assurance that their time does not go waste in any way.

3. ***Subject rooms:*** There are subject rooms instead of classrooms. These are also called as subject laboratories. Each subject room is in the charge of a subject teacher who always remains in the subject room to help and guide the pupils whenever need arises. The different apparatus, appliances, instruments, etc are furnished in respective subject rooms. School library is divided according to their respective subjects and is distributed among the subject laboratories. Like the different departments of university viz. physics, chemistry, zoology, education etc. Every kind of material is found in their respective departments like is the case of Dalton Plan's subject rooms.
4. ***Records:*** The progress of pupils in each subject is kept in the form of cards called progress cards. These cards record the achievement of the pupils in different subjects. The pupils maintain one card showing their progress in different subjects and another card by subject teacher which is hung in the respective subject room. The card works as a feedback device for them because it reminds them that how much work they have done and how much work lies ahead, how many students are working faster than me and how many students lag behind me. In other words, it alerts him where he stands in the class. It energies him to work harder in order to complete his work in the promising period.
5. ***Conferences:*** Sometimes the subject teacher feels the need of oral lessons in his own subject. Such oral lessons are arranged after the recess. The teacher holds oral lessons and discussions. This period is called conference period. In conference period, the teacher removes common difficulties, gives necessary oral instructions and discuss various items of interest and importance. These conferences are generally held four times a week, but the number of conferences may be increased or decreased depending upon the needs of a class at any time. The teacher removes common difficulties through these periods.
6. ***Time Table:*** This plan does not give any importance to time table but takes into consideration the time budgeting. It means that the pupils divide the time according to the demands of their subjects. For example if a pupil has to learn mathematics and Urdu in a school, the pupil needs more time to mathematics than to Urdu and he divides the time according to his weakness in a subject and not on the basis of ringing bell.
7. ***Daily time schedule:*** A day's work is divided into four parts. When the pupils come to the school, they meet for 15 minutes called organizational period. In this period they prepare the plan for the day. Secondly, they go to their respective rooms and devote their time according to time budgeting. Thirdly they meet during the conference period where teacher removes their difficulties. Lastly they meet for group work and utilize this period for minor subjects like music, painting, gymnastics and drill.

PROJECT METHOD

Project method of teaching is the outcome of John Dewey's philosophy of pragmatism or experimentalism or instrumentalism. Prof. William Kilpatrick, a follower of John Dewey, was the originator of this method and J.A. Stevenson further worked on it and perfected it as a method of teaching. In the words of Kilpatrick, "Project is a whole-hearted purposeful activity, proceeding in a social environment". It means that it is the activity chosen from real life situations and completed in a social set up. It is a problematic act which requires reasoning, imagination, evaluating, recording and judging and is carried to completion not left unfinished. Those problematic situations should be provided which have a definite purpose and significance for the learners otherwise project will be left unfinished. Here emphasis is not on teaching but on learning and learning can be effective not only by doing but through living in a social environment.

Definitions:

1. ***Kilpatrick:*** "A project is a whole-hearted purposeful activity, proceeding in a social environment.
2. ***Stevenson:*** "A project is a problematic act carried to completion in its natural settings."
3. ***Ryburn:*** "A project is a purposeful activity which is completed in vacuum with co-operation and understanding."
4. ***Snedden:*** "Project is a unit of educative work in which the most prominent feature is some form of positive and concrete achievement."

Principles:

1. ***Principle of purpose:*** Project method is a purposeful activity. Any activity which has a clear cut purpose for the learners becomes interesting and stimulates them to complete that work. It prepares student's mind for further learning and leads to completion of any project.

2. ***Principles of Activity:*** The principle of activity has great significance in project method of teaching. A child by nature loves those things which he does by his hands and head. We should provide ample opportunities to children to think, plan and carry out the projects themselves and it helps them to achieve the goal or to complete their projects not lefting unfinished.
3. ***Principle of Utility:*** Pragmatists gave main emphasis on the utility or practicability of things. According to pragmatic thinkers, any knowledge which does not find practical applications in life is not real knowledge. Knowledge gained by children should have some immediate practical significance. Children love those things which help them in solving their immediate difficulty. A child will not show much interest in those projects which have no utility for them. So project method incorporated the principle of utility in it.
4. ***Principle of freedom:*** Freedom should be given to children in any work and that becomes useful for the learners as well as for society. Any project which is not completed in a congenial environment goes in vain. When the children are given freedom, they can express their thoughts, beliefs, ideas, attitudes etc freely which will lead to the development of a well adjusted personality.

STEPS/PROCEDURE:

1. ***Providing a Situation:*** As the practical working starts of the project method, the teacher first of all provides the different situations. The different situations should be provided in such a manner that the pupils may feel it necessary to overcome those difficult situations. Resolving or overcoming of the difficulty becomes a project for them. These difficult situations may arise from discussion on various situations like difficult topics, pictures, buildings or cities, educational trips, days of national importance and many kinds of other social activities. Stevenson taught the use of the electric bell to his high school students by the project method. In this step only situations are provided and not the choosing of projects.
2. ***Choosing the Project:*** When the students feel difficulty in any situation, then the step of choosing it and working on it starts. Students choose different projects according to their interests and abilities. They may choose projects individually or collectively. The teacher should not himself choose the project according to his interest and make the students to accept it because its main aim is to make the students independent in thought and choice. Teacher should act only as a guide in selecting the projects. He should see the purposing of the projects chosen by them because every activity follows a definite purpose or goal. As Kilpatrick writes, "the part of the pupil and the part of the teacher in most of the school work depends largely on who does the purposing. It is practically the whole thing." So the teacher should help them whenever they choose the wrong projects which have no significance or purpose or goal. He should also see that the projects chosen by them should not be too lengthy, costly and un-useful for the society.
3. ***Planning the Project:*** After the selection of a suitable project, the next step is to plan the project. It means how to start the work, how to execute and how to evaluate the project is done under planning. While planning, at first there should be oral discussions about the chosen project followed by writing of proposals. Every detail of the project is discussed thoroughly and responsibilities are assigned to the different students. The entire planning of project is done under the guidance of the teacher, after a good deal of discussion.
4. ***Executing:*** It is the real learning step of project method. Students undertake activities according to their responsibilities and individual differences. At this stage, they work and collect information according to their projects. They perform many activities like reading books, visiting different places, getting information from different persons and all those resources which help in the successful completion of their project.
5. ***Evaluating:*** In this step, the students evaluate their respective projects. They check their work and learn from the mistakes they have committed during this project. Through evaluation, they get training in self-criticism that whether the work done was according to project or not, have we learnt new things through this project or not, was our choice correct or wrong etc.
6. ***Recording:*** After the completion of the project, the students should keep a project-book in order to record their work. There should be record of all activities and all the sources of information which enabled them to complete their projects. In nut shell, the whole procedure from providing a situation till evaluating should be recorded in the project-book.

HEURISTIC METHOD

The Heuristic method of teaching was developed by Prof. Armstrong. It was first used for teaching science subjects and latter on it was used for teaching other subjects also. The word Heuristic is derived from the Greek word "Heurisco" which means to find out, to search out, to discover, to investigate. Thus in this method, the students found things for themselves, e.g., when a student is performing an experiment in a chemistry laboratory by mixing two chemicals, he does not know what the results will be. After completing his experiment he finds some results and it means the use of Heuristic method in his learning process. In these methods the students are placed in the position of actual discoverers and are told as little as possible about the problem. It involves maximum usage of thinking and logical reasoning. Its main aim it to develop scientific attitude among learners. In the words of W.M. Ryburn, "This method as the name implies, is a method by which the pupil discovers things for himself. The pupil is put in the position of a pioneer and he finds his way along the path of knowledge as did those who first discovered the facts, principles and laws which are now known to all". The pupils search out the knowledge by keeping themselves physically as well as mentally active by solving definite problems. It develops the habit of hardworking in both teachers as well as students. It gives maximum opportunities to an individual to utilize all his faculties in order to search more and more and more.

Principles:

1. ***Principle of Logical Thinking:*** The Heuristic method takes into account the logical thinking of the students. The maximum use of induction and deduction is involved in this method. The students derive some laws, principles or facts on the basis of the experiments, observations and from different sources of information.
2. ***Principle of Discovery:*** The main crux of this method is to develop among students those capabilities and capacities through which they may become actual discoveries of different sources of information. As Spencer writes, "Children should be told as little as possible and induced to discover as much as possible." Hence this method follows the principle of discovery.
3. ***Principle of learning by doing***: Heuristic method is based on the principle of learning by doing or the principle of activity. In other words, Heuristic method involves some elements of pragmatic thought in it. Any knowledge found out by learners involves their active participation in it. He involves his physical as well as mental faculties to search out more and more. Hence it involves the play urge of the children.

Procedure:-

1. ***Presenting the Problem:*** In the first step, the problem is presented before the students. Problem may be given individually or collectively so that each student finds something for himself e.g., the problem may be as: $Na+Cl_2.\rightarrow$
2. ***Guidelines or Advance Tips:*** After the teacher presents the problem before students, he now provides advance guidelines that how the problem will work. What are the essential sources that are needed in order to search out something. In our example, they need beakers, funnels, stoves, Na, Cl_2 etc.
3. ***Pupils at work:*** Now the pupils start working on the problem. They are now free to move from their classroom to the laboratory in which they have to perform the experiment. During their work, they discuss with teacher different questions and doubts in order to search out or find out the results. The teacher too puts questions only to make them mentally alert during their work.
4. ***Evaluation:*** The pupils now evaluate their work and give comments to one another. The teacher's comments encourage the pupils that individual has been appreciated and at the same time each pupil gets guidance to overcome his weakness. They derive the conclusion or results like: $Na+Cl_2 \rightarrow NaCl_2$.
5. ***Application:*** The facts or results achieved by the pupils are then applied to different situations or sees its practical applicability. This helps the learners to develop self-confidence regarding their self-activities. It energizes them for further actions or to find out more and more knowledge.

9/25/2011

About the authors

Muddasir Hamid Malik **holds postgraduate degree in education and M.ed as professional degree. Qualified UGC NET-JRF in education, He is an active resource person and researcher in teacher education. He published several research papers on special education and sociology at national and international level .He is an expert in Educational Technology, Special Education and Research Methodology .He is pursuing Ph.D .**

Email: Malikjavaid321@gmail.com

Aqueel Ahmad Pandith **holds masters degree in Education and M.ed as professional. An M.phil in Education and pursuing Ph.D .He is active resource person and researcher in Special Education .He published several research papers in Special Education at national and international level. He is a specialist in psychology and instructional technology.**

Email: Aqueel.p12@gmail.com

ISBN: 1-59964-050-1

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