

# Critical Analysis of Approaches for Science Teaching

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**Abstract-** Researcher has tried to analyse the approaches of science teaching in light of the microteaching and different teaching methods. Thus researcher has been ongoing through content analysis in empirical and historical perspectives. This work had theories behind teaching is an art as well as science. As an art, it portrays the imaginative and artistic abilities of the teacher in a creative and worthwhile situation in the classroom in which the learners learn and receive the immediate and ultimate goal of education. As a science, it points to the logical, mechanical and procedural steps to be followed to attain an effective accomplishment of goals. This study has stated the certain fundamental principles of teaching technology.

**Index Terms-** Methods, Approaches, Educational technology, Content, Communication, Feedback, Microteaching skills, Phases of teaching, Narration etc.

## I. INTRODUCTION

Human mind is always busy in the pursuit of exploring the unknown man by his keen observation and faculty of reasoning has come to the conclusion that there can not be any event in the nature without any reason. In the process of search for knowledge and truth, man has accumulated a vast store of knowledge known as science through which we can understand our surroundings and environment, making life adjustment in new discoveries, generation to generation transmit the knowledge and progress in civilization. In the words of Fitzpatrick "Science is cumulative and endless series of empirical observations which result in the information of concepts and theories, with both being concept and theories being subject to modification in the light of further empirical observations. Science is both a body of knowledge and a process of acquiring it." Thus science is the way of investigation, thinking, systemization of knowledge with approaches of product and process. Science is a body of knowledge in which include the facts, correction of errors in running concept and theories. The scientific knowledge exists in the form of facts, concepts, principles and laws. Science is a method of inquiry for which science teacher should emphasize that scientist approaches the solution of teaching problem as organized with inspirations, imagination and insight. Science teacher should be adapted the steps for solution of problem as identification, observation, statement of hypothesis, testable production and then finding based acceptance, modification or rejection of the hypothesis. Teacher should be develop the thinking process for develop the attitude in trainees through open mindedness, objectivity freedom from superstitions, beliefness, accuracy methodology and aggregation.

On the above discussions it is clear that teaching is a scientific process and its major components are content,

communication and feedback. Teaching develop the close relationship with learning and its activities and create environment for it whereas teaching skill development strengthened with sophisticated techniques and different designs. Our planning of teaching should include the first step to content analysis identification of objectives and writing these in behavioural terms. This objectives achieved by teaching strategies and feedback.

UGC designed the course of science teaching with necessity of today on the ground of philosophical, sociological approaches in the light of psychological background. The method employed in its presentation are of much importance to the success of the type of course. Design content by use with not lose the sight of facts and values compile the teaching procedure in particular class. VBSPU Jaunpur is running B.Ed. syllabus of science teaching as-

## II. PHYSICAL SCIENCES

**Objective:-** After completing it student teacher will be trained about scientific attitude and different methods of science teaching and could develop teaching aids for delivering the knowledge.

### Unit-1

- Importance of physical science in school curriculum.
- General aims and objectives of teaching Physical sciences at secondary school stage.
- Bloom's Taxonomy of educational objectives.
- Formulation of specific objectives in behavioural terms.

### Unit-2

- Nature of Modern Physical science its impact on communities.
- Path tracking discovers & land mark development.
- Eminent Scientists (Galileo, Newton, Robert Boyle, Avogadro)
- Profession of the area of physical sciences.

### Unit-3

**Transaction of contents and development of instructional material:**

- Transaction of contents.
- Unit planning and lesson planning.
- Preparation of teaching aids.
- Development of demonstration experiments.
- Co-curricular activities.
- Development of self learning material (linear programme).

### Unit-4

**Methods of teaching and skill involved in teachings:-**

Methods of teaching:

- Lec- Demonstration method.
- Project method.
- Problem-solving method.
- Inductive and deductive method.
- Heuristic method.

Skills:-

- Practical demonstration using laboratory.
- Improvisation of apparatus.
- Skill of introducing the lesson.
- Questioning.
- Skill of illustrations with examples.
- Skill of explaining.
- Skill of using black board.
- Skill of stimulus variation.

**Transactional Strategies:-** The course will be transacted through practicum on developing instructional plans, use of teaching methods and aids for augmenting learning potential as self learners and skills in designing classroom teaching learning processes relating to diverse learner groups.

### III. BIOLOGICAL SCIENCES

**Objective:-**

Develop awareness about development in the area of teaching and learning of Biological sciences at the national and international development competencies in the prospective teacher related to Biological science at the lower secondary level with specific reference to Indian school conditions Orient prospective teachers in specific educational aspects of science and technology education e.g. general concept of Biological sciences , aims and objectives of biological science, pedagogical analysis of contents in Biological science at the lower secondary level, transaction of contents, methods of teaching , evaluation etc. Enable prospective teachers to be effective teachers in order to perform the required role as a Biological science teacher under Indian School conditions.

#### Unit-1

**Importance, Aims and objectives-**

- Importance of biological science in school curriculum.
- General aims and objectives of teaching Biological science.
- Bloom's taxonomy of Educational objectives.
- Formulation of specific objectives of Biological science in Behavioural terms.

#### Unit-2

- Nature of modern biological sciences.
- Path tracking discoveries.
- Eminent scientists(Robert hook, Hugo Debridge, Grager John Mendol & Robert coach).
- Profession in the area of Biological sciences.

#### Unit-3

**Development of instructional material:-**

- Transaction of contents.
- Unit planning.
- Lesson planning.

- Preparation of teaching aids.
- Development of aquarium, vivarium etc.
- Development of self-instructional material(Linear program).

#### Unit-4

**Method of teaching and skills(Practical and micro teaching)-**

**Methods of teaching-**

- Lecture demonstration method.
- Project method.
- Problem-solving method.
- Practical skills.
- Preparation of temporary and permanent mounts.
- Collection and preservation of specimen.

**Microteaching skills-**

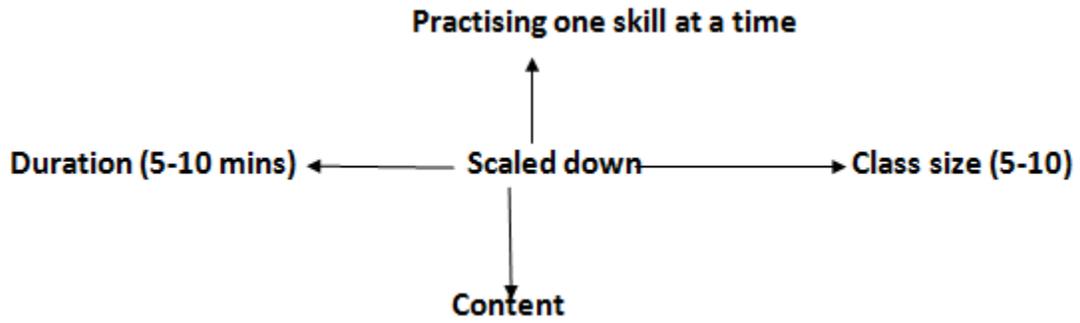
- Skill of introducing the lesson(set induction).
- Skill of questioning.
- Skill of illustration.
- Skill of explaining.
- Skill of stimulus variation.

**Transactional strategies:-**The course will be transacted through practicum on developing instructional plans, use of teaching aids and methods for augmenting learning potential as self learners and skills in designing classroom teaching –learning processes relating to diverse learner groups.

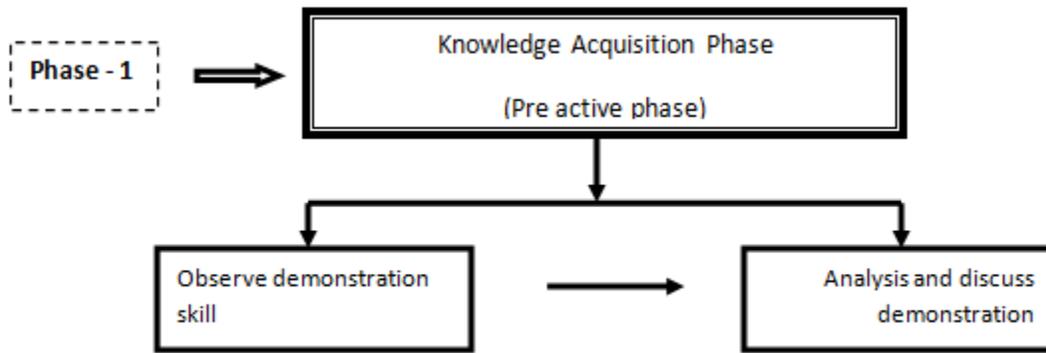
**Methodology:-** Through above syllabus critically analyse approaches are in terms of microteaching only because it is training technique and not a teaching technique. Students teacher learn through this approach to how will introduce the lesson, illustrations, probing questions, blackboard writing with summary of lesson to developed skill. Microteaching design that is used for the training of teachers to make them learn the art of teaching.For this analysed method had been used.

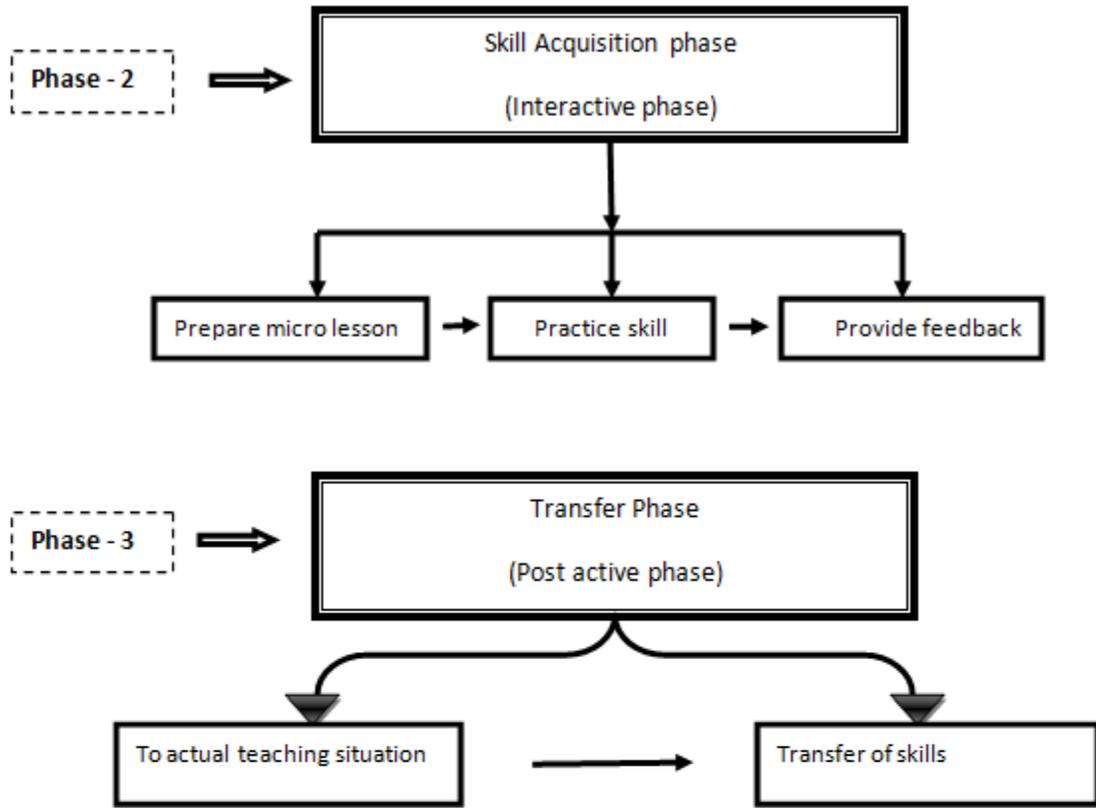
**Analysis and interpretation:-**Microteaching was first introduced at Stanford university , USA in 1963. It was sought to identify , isolate and build training program for critical teaching skills. It is the one of the innovations and technique that has emerged on the map of teacher education for improving the student teaching programme.

Allen. D.W.(1966) said that “microteaching is a sealed down teaching encounter in class size and time.”

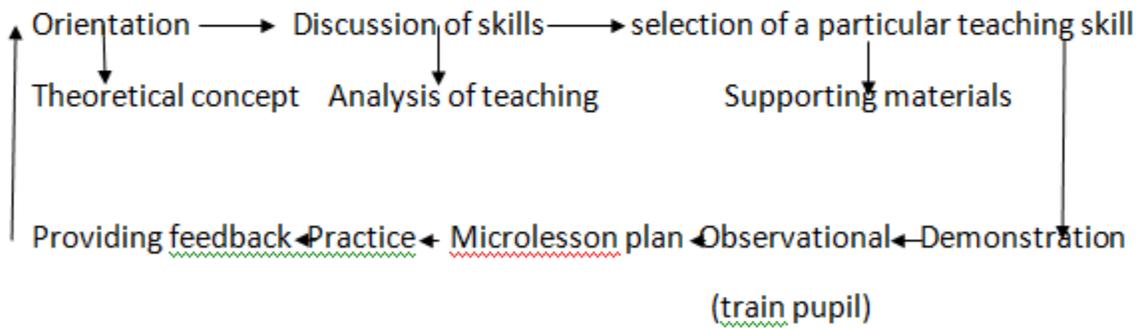


For this training technique involves three phases in which preactive phase is the knowledge acquisition phase , the interactive phase is the skill acquisition phase and the post active phase is the transfer phase.





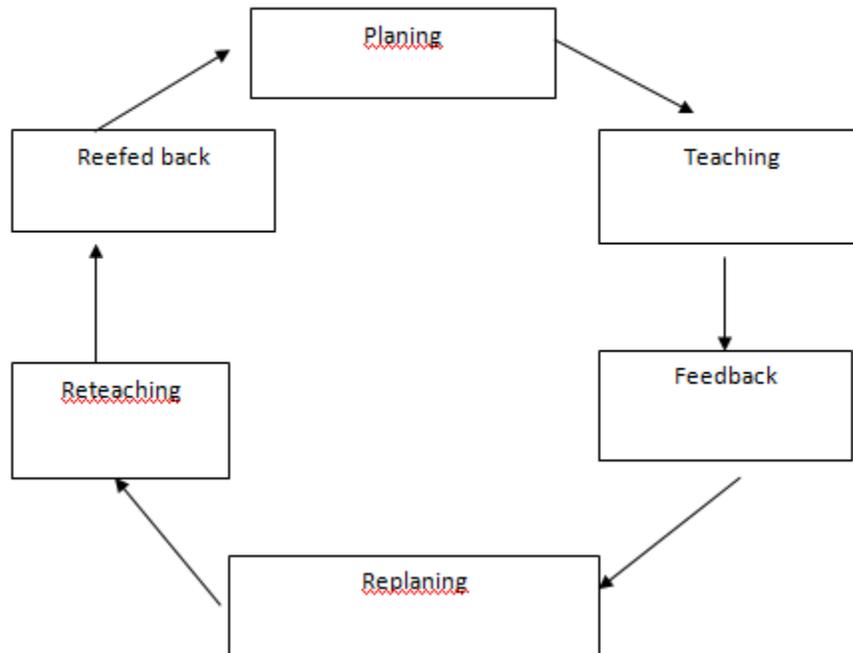
Above phases reveal that a standard procedure of micro teaching. It has been going to phases in following steps->



Teaching 6 min to a class 5 to real pupil

Teaching	6 m
Feedback	6,
Replan	12,
Reteach	6,
Referred bk.	6,
Total	36

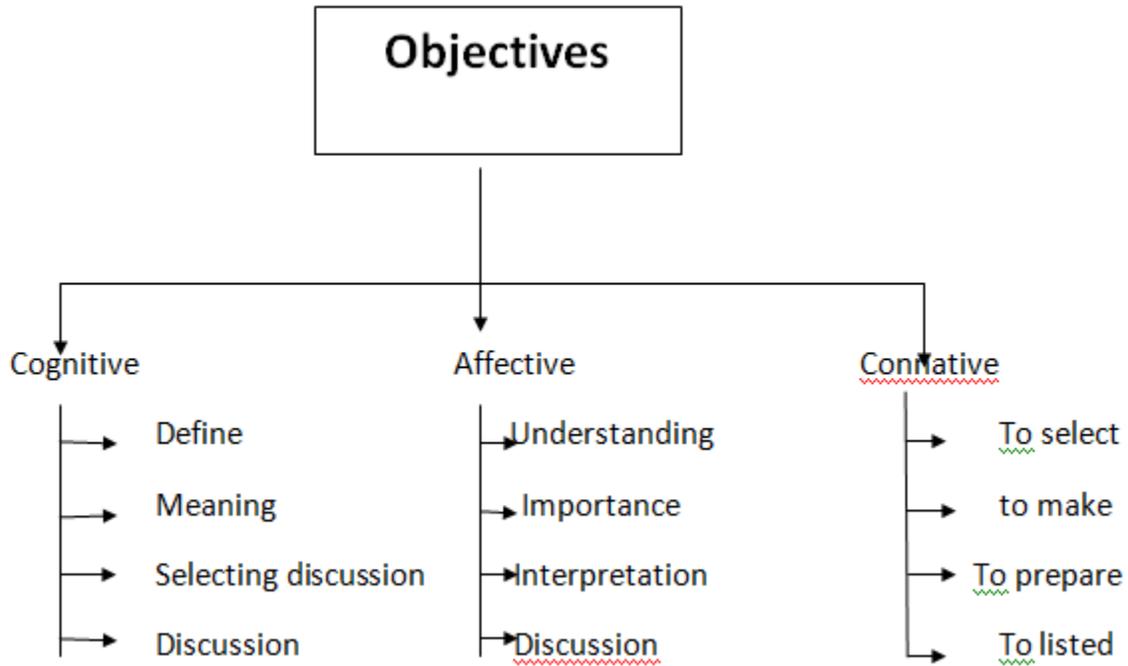
### Cycling of microteaching:-



Large number of micro teaching skills have been identified. The first effort made by Allen and Ryan resulted in identifying fourteen skills. Research have taken only five skills as 1- Objective writing 2- Introducing 3- Illustrating 4-v Reinforcing and 5- Blackboard writing skill.

#### Skills of objective writing:-

Skill of objectives encompasses the proficiency in the use of behavioral term of the topics as criterion. This skills drill to cognitive, affective and connative domain of content how could achieve. Student teachers learn it accordance action verbs define, select, meaning, discuss etc related with cognitive domain, understand, interpretation, discussion, differentiation, and importance etc action verbs are related with affective domain and performing activities identify, to select, to make, to prepare, to listed action verbs related with connative objectives.



**Skill of introducing lesson:-**

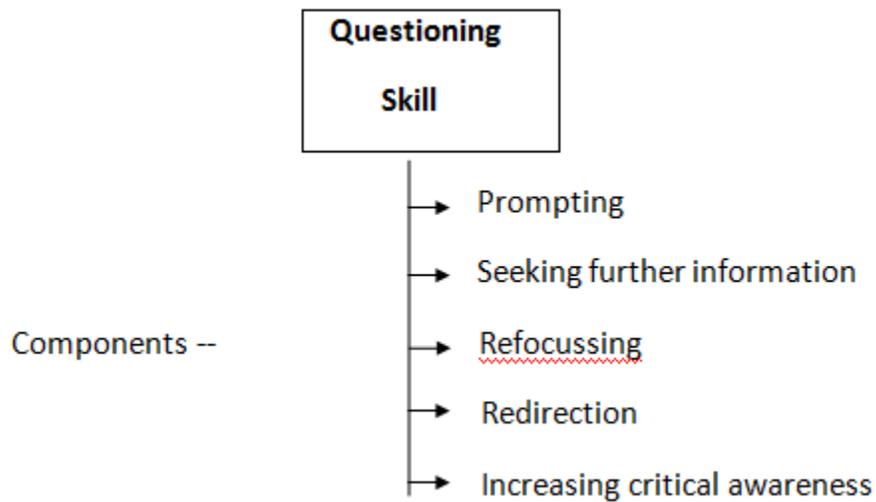
This skill involves the component behavior as utilization of previous experience in introducing a new lesson. Use of appropriate devices and techniques. Maintaining of continuity in the ideas and informations and relevancy of verbal and non verbal behaviors.

Previous knowledge -- Introducing lesson

- Previous related items.
- Series in items.
- Related unit objectives.
- Maintenance of continuity.
- Relevancy of verbal or non verbal behaviour.

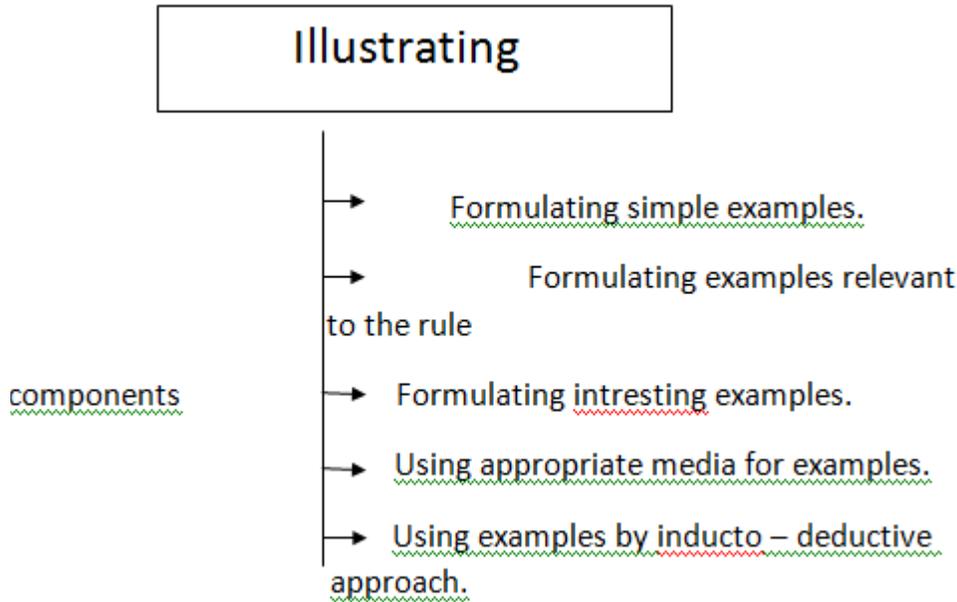
**Skill of probing questioning:-**

It is the art of response management comprising a set of behaviors or techniques for going deep into pupils responded with a view to elicit the desired responses. In teaching learning situation questioning is major device. This skill consists Propting, seeking further information, refocusing, redirection and critical awareness.



**Skill of Illustrating with examples:-**

This skill related with questions and importance of teacher’s statement with the help of supporting system like giving analogy, telling story, showing objects, model pictures, diagrams, maps and charts, demonstrating experiments etc. The components of this skills as simple example formation, relate with rule or concept, formulating interesting examples, appropriate media examples and using examples by induct – deductive approach.



**IV. SKILLS OF USING BLACKBOARD**

In teaching activities Blackboard is suitable convenient teaching aid because student teachers have learn the art and skill of using it. This is the chalk talk medium as right hand teacher. The main components involved in this skill are legible hand writing,neatness of blackboard work,adequase content average in the blackboard,proper sequence of point on the blackboard.

**V. CONCLUSIONS**

Researcher has been concluded on above analysis that microteaching is essentials of teacher training programme. Microteaching helps a training institutions to overcome the hardships faced and become independent of factors in terms of availability of pupils,classrooms,cooperation from the staff on the practicing schools,simplitions the concept of teaching into sets of simpler skills comprising classroom behaviour by it helps in providing proper understanding of the meaning of the teaching. According to miniaturized classroom,size in purpose,time and lesson as drill the skill in the microteaching.It provides feedback immediately,proper opportunities for practicing on e components teaching skill at a time by using single concept of the content. Thus it is clear that a trainee can experiment with several alternatives in a limited time and resources and it works as a laboratory exercise to focus training on the acquisition of teaching skills.

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