**Techniques of teaching Mathematics**

**Ability grouping**

Ability grouping is an educational approach that places students in groups based on academic achievement. The common purpose of ability grouping is to provide instruction that is appropriate for students and their individual needs.

The two most common forms of ability grouping are between-class and within-class ability grouping. Between-class ability grouping is the practice of separating students into different classrooms based on academic ability or past performance (Matthews, Ritchotte, & McBee, 2013). Whereas, within-class ability grouping divides students within a class based on academic ability, past performance, or student interests.

These groups are typically assigned by the teacher and may be heterogeneous or homogeneous. It is the intent for ability grouping assignments to be flexible, which means that students can easily move in and out of grouping assignments based on performance.

**Advantages of Ability Grouping**

Proponents of ability grouping use the following arguments in support of their stance -

**1. Increases pace:** Ability grouping helps in placing similar students in one classroom or group. Thus, it helps in increasing the pace of advancement of the study skills of the students at higher levels of ability. The higher standard students can grasp concepts within a shorter time as compared to other students and can be allowed to move forward. Otherwise, in a heterogeneous classroom, the better students would have to wait for the others to understand a particular topic, as a result losing time and decreasing the pace of their growth and development.

**2. Individual attention:** Providing individual attention is difficult in a heterogeneous classroom, since teachers almost have no choice but to give equal attention to all students present. However, in the case of a homogeneous classroom, teachers can concentrate on teaching the students at the pace of that particular group, thus enhancing their learning process and helping them to pick up the lessons faster than otherwise.

**3. Boosts confidence:**In a heterogeneous classroom, the weaker students sometimes have self-concept issues due to the presence of more intelligent students who grab the upper ranks in class. But in the case of a homogeneous classroom, the other students are at about the same level. Thus, it boosts their self-confidence and determination.

**Disadvantages of Ability Grouping**

Those against ability grouping use the following arguments to discourage its use -

**1. Feelings of segregation:** Dividing students into classes based on ability can be difficult for young students to manage, and can set up a kind of "caste system" within our schools, causing unnecessary division and arguments.

**2. Methods of division:** What system can be used to divide students that is fair and equitable? Standardized tests may not accurately reflect the abilities of the students, and some students could be placed in the wrong groups.

**3. Teacher expectations:** Even if they did not do so consciously, teachers may treat students in the different groups as superior of inferior based on their groupings, leading to the perception by the students that they are not talented enough to do as well as their peers in other groups.

**Gradation**

The **Principle of Gradation or division** of teaching says that easy and simple things should come first and difficult and complicated things will occur afterwards.

For effective teaching, concepts should be introduced step by step. This is called Gradation. For students, to discover mathematical principles by their own, it must be presented in a gradation way.

The teaching should be proceeding from simple to complex. This teaching technique is good for gradation. Psychologically this is very important principle. If complex concepts introduce from the beginning, that teaching will be ineffective. That will affect student's confidence level and it makes concept attainment more difficult. Moreover they can’t understand concepts on heuristic method by their own.

The main thing to be noticed is that we should proceed to the next stage only after the successful completion of each stage. Maintain the motivation by giving reinforcement through formative evaluation. Understanding addition facts or any other mathematical facts is very difficult for students without gradation. Moreover, because of the difficulty from the vague concepts, students will feel afraid of mathematics. In mathematics, all lessons we can teach like this.

Gradation will make the teaching meaningful. After the teaching is completed, each question should be give using gradation principles. That way start with simple problems then difficult problems, this order has to be followed when giving problems. Gradation is not only included in subjects, is also included in teaching learning process. Like, concrete to abstract, simple to complex, empirical to rational and known to unknown etc. These all gradation principles are using in teaching learning process.

A teacher should acquire a skill to start a class by giving familiar facts and experiences for students. Piaget’s thoughts on cognitive domain to make it firm through accommodation & assimilation in each steps, and Gagne’s idea on chaining put more light into these gradation theory. These all gradation principles are also known as maxims of teaching.

The maxims of teaching are very helpful in obtaining the active involvement and participation of the learners in the teaching learning process. They make learning effective, inspirational, interesting and meaningful. A good teacher should be quite familiar with them.

**Questioning**

A question is defined as any sentence which has an interrogative form or function. They are instructional cues or stimuli that convey to students the content elements to be learned and directions on what they are to do and how they are to do it (Cotton, nd.). The ability to ask and answer questions is central to learning. The use of questioning skills in a systematic manner is important for interactive investigation in any subject. Classroom questions should be evaluated and analyzed since questioning is an important teacher behavior (Belland, Belland, & Price, 1971).

Purpose of Questions

To increase students’ participation in their teaching-learning interaction.

To encourage students to think at higher cognitive level.

To motivate students to search for new information.

To arouse the students’ interest and their curiosity in the topic of instruction.

To develop the students’ active way of thinking and learning.

To guide students in the process of finding a good and correct answer.

To help students concentrate on the topic under discussion.

To serve as a guide to students’ learning and demonstration of learning (examination).

To emphasize key points.

To ascertain students’ knowledge level in a bid to modify instruction.

Generally there are always two categories:

Factual/ Higher Cognitive,

Closed/ Open,

Convergent/ Divergent,

Low Order/ High Order,

Low Inquiry/ High Inquiry.

Another popular questioning type is the Blosser (2000) categorization into four types: Managerial, Rhetorical, Closed, and Open.

1. Rhetorical Questions : They are questions used to emphasize a point or to reinforce an idea or statement.
2. Closed Questions : Questions to check retention or to focus thinking on a particular point. They have limited number of acceptable responses or “right answers.”
3. Open Questions: They are used to promote discussion or student interaction and anticipate wide range of acceptable responses rather than one or two “right answers.” Draw on students’ past experiences and cause them to give and justify their opinions, infer or identify implications, formulate hypotheses, and make judgments based on their own values and standards.

Other question types include: focusing, broadening, probing, hypothetical, leading/prompting, multiple, evaluative, justifying, etc.

o Focusing Questions: They are used to focus students’ attention on the day’s topic or lesson.

o Hypothetical Questions: These are questions that set up a possible situation or problem and ask the students for a possible course of action.

o Probing Questions: They are used to get under the surface of an initial answer. Having got the students talking the teacher can use probing questions to bring out more detail. While the same questions are asked of students, the use of probing questions will vary according to the student’s response.

o Alternative Questions: They are questions used to help students make a decision.

o Broadening Questions: These are questions used to introduce additional facts and to encourage analysis. Examples are questions talking of differences or relationships.

o Evaluative Questions: They are questions that deal with matters of judgment, values, or choice. Two sides of the argument should be presented for quality evaluative question.

o Justifying Questions: These are questions used to challenge the old ideas or develop new ideas, no right or wrong answer.

o Leading/Prompting Questions: These are questions that suggest the expected answer. They are used to guide students thinking and should be used sparingly for moral or ethical issues, because answer implies acceptance.

o Multiple Questions: They questions with two or more distinct parts, each requiring an answer.

**Effective Questioning Techniques**

1. Be clear and economical in the phrasing of question.
2. No double or multiple barrelled questions.
3. Purpose should be clear in relation to the topic.
4. Tangential issue should not be focused.
5. Pose the question first, before asking a student to respond.
6. Allow plenty of “think time” by waiting at least 7-10 seconds before expecting students to respond.
7. Make sure you give all students the opportunity to respond rather than relying on volunteers. Hold students accountable by expecting, requiring and facilitating their participation and contribution.
8. Establish a safe atmosphere for risk taking by guiding students in the process of learning from their mistakes.
9. Encourage variety in the type and difficulty levels of questions.
10. Encourage students to ask questions at any time. Use redirection option by redirecting a student’s question to other students
11. Give adequate consideration to all questions-never evade a question.
12. Scatter questions over the entire class.
13. Adapt questions to the level of the students
14. Use pre-planned and emerging questions.
15. Avoid tricky questions and those that require Yes or No response
16. Respond to answer questions asked by the students as it can serve as reinforcement for learning.
17. Learn to carefully listen to students’ questions and answers.
18. Do not be ashamed of acknowledging difficulties in answering students’ questions to avoid giving wrong answers.

**Practicing Skill of Questioning**

The skill of asking questions in the class room teaching is very important. By asking questions again and again, the teacher makes the pupils more thoughtful. He enables them to understand and subject deeply. Questions are those which help the pupils to think in depth about the various aspects of the problem. The teacher can use the questions in the following situations:

**Prompting**

When a pupil expresses his inability to answer some question in the class or his answer is incomplete. In some question pupils get some prompting regarding the answer. The teacher can ask such questions when the pupil expresses his inability to answer or accept frankly that “he does not know.” The teacher can ask such questions which prompt the pupils in solving the already asked questions.

**Seeking further information**.

When the pupils answer correctly in the class but the teacher wants to seek more information. In class, when the pupils are unable to answer any question or answer partially, then in order to receive complete and correct answer, the teacher can ask such questions by accepting that the answer given is correct, but the pupil should reveal more. There can be alternate answer to the question asked such as elaborate your answer more or why do you consider your answer correct. In this way, the teacher can seek maximum information from the pupils.

**Re-focusing**.

Sometimes, the teacher can ask probing questions to concentrate the attention of the pupils. For the very same purpose, the teacher may ask same question from other pupil.. Sometime, the teachers are not satisfied with the pupils’ answers. They draw the attention of the pupils towards different situations where the similar problems can arise. This makes the transfer of learning possible.

**Redirection**

If the teacher wants to introduce the pupils with various aspects of the problem in class room then he can ask the same question after slight changes in the language In class, the teacher tries to develop the reasoning power in the pupils by asking various questions. This enables the teacher to encourage the pupils for maximum participation.

**Critical Awareness**.

In order to develop the reasoning power of the pupils in class, the teacher can ask questions bearing ‘Why’, by getting motivate from such questions, pupils involve themselves in the process of reasoning. The questions bearing ‘Why’ and ‘How’ are asked. By asking such questions, the teacher can develop critical awareness in the pupils.

**Brain storming**

Brainstorming as an idea for the first time emerged back in 1942.The term was introduced by Alex Faickney Osborn, founder and advertising executive of the US advertising agency BBDO. In fact, brainstorming was introduced as a creative technique inspired by the working atmosphere in BBDO.

DEFINING BRAINSTORMING

The concept of brainstorming includes defining a simple or a complex problem for which solution are generated different ideas that are later accepted or rejected. The participants in the process of brainstorming present and reveal new ideas as potential solutions for a specific problem. In this process, brainstorming helps the stimulation of the human mind towards creative problem-solving. This creative thinking technique as a group activity usually starts with a gathering of a group of people. As an informal method of problem-solving, group brainstorming stimulates creative thinking. The proposals that come up in these constructive meetings can provoke interesting and unusual ideas that later could become a creative solution to a problem.

TYPES OF BRAINSTORMING

Group Brainstorming

Group brainstorming helps people to activate their minds and think freely since during these group sessions there isn’t a criticism of ideas. When 6-8 students brainstorm together, they spontaneously exchange ideas that tend to grow and converge.

Individual Brainstorming

Individual brainstorming, on the opposite, involves storming by yourself. It is known that individual brainstorming can stimulate the production of a wider and better array of ideas.

TECHNIQUES OF BRAINSTORMING

Aside from brainstorming, there are numerous problem-solving and goal-achieving strategies and techniques among which the most used are

• Abstraction

• Analogy

• Divide and Conquer

• Hypothesis testing

• Lateral thinking

• Means-end analysis

• Method of focal objects

• Morphological analysis

• Proof

• Root cause analysis

• Trial-and-error

Several factors can influence one’s decision to choose brainstorming over all other strategies. The most important characteristic of brainstorming is that it is defined as a creative activity that encourages creative thinking from all participants. On the other side, other brainstorming techniques can limit this process and result with presenting uninspiring solutions and ideas.

PHASES OF BRAINSTORMING

Three phases of effective Brainstorming as follows:

1. Generation of ideas

2. Discussion of the produced ideas

3. Final evaluation of the presented ideas.

Phase I: GENERATION OF IDEAS

1. Preparation. Know your goals. Clearly define where you are now and where you want to be.

2. Prepare an executive summary that can be quickly scanned for the key points you need your team to focus on.

3. Now decide whom to invite.

4. Provide the executive summary with the meeting request, and ask them to bring three ideas to share during the session.

5. Reserve ample time for your group to be effective, yet focused. Motivation decreases with each follow-up session you have to add.

Phase II: DISCUSSION OF THE PRODUCED IDEAS

1. Facilitation. Like any meeting, a brainstorming session needs structure. Designate a facilitator to encourage participation, act as timekeeper .

2. Have a note taker write ideas on a whiteboard or easel pad. This will have one major positive consequence – visual proof of progress.

3. Before ending the session, make sure there are clear, agreed-upon takeaways and next steps. Everyone needs to leave the session knowing his or her role in the next phase.

Phase III: FINAL EVALUTATION OF THE PRESENTED IDEAS

1. Follow Through. After the session, share the most viable ideas, separating them by those more easily implemented vs. those tabled for further discussion. If possible, take action on one or two ideas immediately, so everyone can see the result of their work.

2. Don’t let the good ideas fall into a black hole. Make sure a single person, strong in follow through, is responsible for advancing the ideas and achieving your original goals. This person might be you, but can be a key staff person.

3. Communicate progress with the entire team, even those who have no further role after the session. Keeping colleagues informed shows them you value their time and knowledge.

CHARACTERISTICS OF BRAINSTORMING

• It is defined as a creative activity that encourages creative thinking from all participants

• This activity allows the creation of an open and relaxed atmosphere that stimulates everyone’s participation.

• It creates an environment in which people feel comfortable enough to share their opinion and point of view.

• It motivates sharing extraordinary ideas.

• Group brainstorming can also be beneficial for establishing closer and effective relationship with colleagues and superiors.

• Exchanging different ideas among group

• Everyone shares their ideas, eventually those who are more apprehensive will loosen up and join the group.

• Learning can be improved by practicing brainstorming because it gives the chance for improvement in the processes of lateral, analytical and critical thinking.

• Individual brainstorming while studying is an effective way of producing ideas, measuring comprehension and in the end, analyzing knowledge.

• By concentrating on ideas that revolve around the important aspects of the central topics, students can grow their ambition for learning and discovering new ideas.

• It can also improve the student's reading and writing and comprehension skills.

**Seminar**

A seminar is a group meeting (either face-to-face or online) where a number of students participate at least as actively as the teacher, although the teacher may be responsible for the design of the group experience, such as choosing topics and assigning tasks to individual students.

The seminar method is the most modern and advanced method of teaching. A seminar is an advanced group technique which is usually used in higher education. It is an instructional technique it involves generating a situation for a group to have a guided interaction among themselves on a theme. It refers to a structured group discussion what usually follows a formal lecture or lectures often in the form of an essay or a paper presentation on a theme.

Salient Feature of Seminar Method:

•This seminar method gives good motivation and learning experience.

•Help to evaluate the learning ability of learners.

•Regulate the creating and organising of facts and information.

•Dissemination and retrieval of information is scientifically managed.

•Develop the self reliance and self confidence.

•Also inculcates the responsibility and cooperative nature.

•This method is the best for socialisation/networking.

•Students’ interaction is possible in participation and production of teaching learning process.

•Traditional monotony is abolished in this method.

•Ensures the understandability and enhances the capability of the students learning.

•Seminar is always subject / theme specific, so that sufficient knowledge about the concerned subject can be developed.

•The presenter or the reader of the article can get further clarifications in his subject.

Develop the questioning skills.

•The data processing and analysis also play a vital role in this method.

•This makes teaching and learning process lively.

•The student receives good information from his teacher and fellow students.

A seminar does not end in the premises after the completion of discussion, the group in smaller groups carries on the discussion in informal settings in off campus. This is certainly a strong advantage of using seminar method.

**TYPES OF SEMINAR**

Seminars are conducted in various stages. Based on the size and organizational aspects the seminars can be classified into four types. viz.

*Mini seminar:*

Its coverage and scope are small and simple. A small population is enough to hold this seminar. A discussion held over the topic taught or to be taught with the students is known as topic for Group discussion. Such group discussions are held in an organized way within a class room, it is called mini seminar. This mini seminar gives the students training in questioning skills, organizing the information and presentation skills seminar. A mini seminar is felt necessary because it gives good experience to conduct a major seminar at Institutional level.

*Major seminar:*

The seminar conducted at an institutional or departmental level for a specific topic or subject is known as Major seminar. Usually students and teachers are participating in this type of seminar. This major seminar can be organized at the department level for every month. A specific topic or subject is selected for the theme of the seminar.

*National seminar:*

An association of any kind, particularly with academic or professional interest or an organization(Government, Firm, etc.,) conducts the seminar at national level is called National seminar. The subject experts are invited to the seminar for discussion. The Secretary of the seminar prepares the schedule and functionaries for seminar.

*International seminar:*

Usually the seminar conducted by an international organisation or agency is known as International seminar. Theme of this seminar has wider aspects. Globalisation, Renovation, Atomic energy agreements, Policies implementation and modification etc. are some examples.

**MERITS & LIMITATIONS**

Merits of Seminar method:

• Naturally, spontaneous learning can be achieved effectively in this method.

•Seminar is usually learner-centric.

•Information seeking and retrieval behaviour is encouraged very much in this method.

•The learner himself prepares and compiles his own paper for the seminar gives readiness of mind and learning becomes structured.

•Learning by doing is encouraged in this method.

•The paper presenter / participant receive a reinforced learning experience from the Group discussion.

•Learning experiences is highly structured by the learner himself.

•The teacher or chairperson of technical session only plays the Guidance and instructional role.

•Develops cognitive, affective domains based learning.

• Norms of behaviour is developed and reinforced.

•Develops open mindedness, suppress the subjective ideas from the learners.

•The interactions and interrogations develops the spirit of information seeking behaviours (norms of behaviour)

•The data processing skills, compilation skills, communication skill are easily inculcated in this method.

•Learner gets in-depth knowledge of the subject he presented.

•This method builds better social values learner. Limitations of Seminar method:

•Setting up of a seminar for every topic in the text is not feasible.

•The subject area to be taught must be relevant to the theme of the seminar.

•The seminar themes must conform to the learning experiences to be inculcated to the students.

•This method is usually found fit only for higher learning.

•Implementation of this method for lower and fault tolerance levels in the minds of classes is cumbersome.

•Only matured and balanced minded teachers can make this method successful.

•The teacher must be resourceful (both in academic and administrative) in nature.

•Time management is somewhat difficult.

•Unnecessary gossip, glitches among the participants may deteriorate the scope and objectives of the seminar.

•Passive observation without interaction also make seminar dull and worthless.

**Simulation**

Simulations are instructional scenarios where the learner is placed in a "world" defined by the teacher. They represent a reality within which students interact. The teacher controls the parameters of this "world" and uses it to achieve the desired instructional results. Students experience the reality of the scenario and gather meaning from it.

A simulation is a form of experiential learning. It is a strategy that fits well with the principles of [Student-Centred](https://teaching.unsw.edu.au/node/441) and constructivist learning and teaching.

Simulations take a number of forms. They may contain elements of:

* a game
* a role-play, or
* an activity that acts as a metaphor.

Simulations are characterised by their non-linear nature and by then controlled ambiguity within which students must make decisions. The inventiveness and commitment of the participants usually determines the success of a simulation.

Mathematicians, game theorists and economists use simulation to model and analyze probabilities and statistics in theoretical events. They can also build models that closely match real-world situations, apply various tests and variables on this situation, and gain insight into the real world.

**Advantages of Using Simulations in Education**

Simulation tools offer many advantages compared to traditional teaching methods.

They are able to demonstrate abstract concepts, allow interaction between users and simulated equipment, and provide users with feedback that allow users to improve their knowledge and skills.

They are also cost-effective over the long-term.

Simulation tools can transform abstract concepts into interactive visual content, making it easier for students to understand the performance and relationship between different system parts.

They can become familiar with the equipment and environment, and practice necessary skills without risking accidents to themselves, the equipment, and the environment.

A wide variety of scenarios are available for students to experiment in, such as emergency events, so that they are able to execute the appropriate procedures when these events occur in the real world.

Students are able to reinforce theoretical knowledge with hands-on-training through simulation tools, giving a better understanding of the material.

Simulation tools can track student progress and provide standardized feedback that can aid in developing skills.

They can also offer targeted skill development—students can choose which skills to improve on and receive specific training resources, and educators can also control the content.

Training materials can be easily updated, developed, or modified, and training can be done regardless of time or place. Inability to access to physical training equipment is no longer a problem as simulated equipment is always accessible.

Simulation based technical training is cost-effective in the long-run, but the initial cost of creating them can be expensive. A high level of knowledge is needed to create the models and scenarios used in training.

However, simulation tools save money by increasing the rate of skill development which reduces training time with physical equipment. This limits machine downtime, reducing impact on workplace productivity.

These tools also allow students to train and experiment in a safe and controlled environment, avoiding the possibility of damage to themselves and expensive equipment.

They are also reusable, and removing the necessity for equipment can reduce the cost of a course or program.

Overall, as technology improves, simulation tools will continue to deliver realistic and immersive training scenarios, making them an indispensable and inexpensive educational tool.

**Assignment**

Assignment method is the most common method of teaching especially in teaching of Science. It is a technique which can be usually used in teaching and learning process. It is an instructional technique comprises the guided information, self learning, writing skills and report preparation among the learners. The Assignment method is an important step in teaching and learning process (Douglas).

Bates defined that the Assignment given in the lesson concerned to the student must train them in self learning and to acquire the presentation skills of the learners. The assignment method inculcates the learning experiences and information retrieval and report writing skills. The following objectives can be derived from the Assignment method. The diverse and multiple learning experiences must be coordinated with a common method is an important objective in Teaching of Science. The assignment method can integrate and coordinate the different learning experiences of a learner from different approaches.

It provides good training for information seeking and retrieval behaviour.

It inculcates the self learning attitude among the students.

It provides information analysis and research attitude to the learners

It develops the learning experiences from various sources.

**Qualities / Features of a Good Assignment:**

The significance of the Assignment has not been felt by the students because they were given by the individual without having proper understanding of the objectives of assignment method.(Tram) Assignments given with ambiguous instruction and lesser time to complete the task are also results in to sub-standard work by the students. So that the teachers should identify the selected units / topics as the assignment work.

A good assignment has the following best features and provides a good learning experience. Assignment must be relevant to the subject taught to the student. This should reflect the affinities with the subject contents in the text book concerned.

Assignment must be simple and enable the students to complete it within the stipulated time. Assignment must avoid ambiguous, complex information and instructional structure. Objectives of the assignments must be clear and definite.

Assignment must be given with other methods of teaching enable the good learning experiences. Assignment should be given ensuring the level of the students’ age, attitude, skills and availability of resources for the topic / unit.

Assignment must develop the creativity and capable of individual learning by doing. Assignments given to the students may challenge their thinking and analysis power.

The group assignments may encourage the coordinated learning among the students. The difficult task can be handled by fast learners and normal and easier task can be shared by slow learners facilitates students to complete and achieve the objectives of the group assignment.

Generally the selection of the topics / units for the Group assignment must be done by the group of students themselves.

**Types of Assignments**: Generally, the assignments are classified in to two types:

Home assignments and School Assignments

Home assignments: The assignments given by the teacher is completed by the students in their home with the help of reference books and instructions / information provided by the teacher. The Completed assignments were evaluated by the teacher.

School assignments:

Prior to the experiments to be done or any difficult tasks, the teacher interrogates some questions regarding the experiment or tasks. The students have to find the answer with the help of text books and library books and report it in written form. The teacher observes the information collected by the students for the assignments. If the information collected is relevant and sufficient, the students will be allowed to proceed further towards the experiment or tasks. Other wise they are again instructed with further information and clarification to resubmit the assignments. Such assignments are termed and known as School assignments.

**Advantages / Merits of assignment method**:

Provides opportunity in self learning for the students

Better learning experiences will be gained when combined with other science teaching methods.

Assignment provides sufficient flexibility in learning pace of the students. The slow learners too adapt with this method.

Teachers’ interruption is very much reduced and the students’ active participation is encouraged.

Teacher acts as a role of guide only.

The students received a better training in the learning by doing method in this method.

The information seeking and retrieval behaviour is developed among the students.

It gives better understanding in scientific method and projects.

It can provide space for the individuals learning attitude and their speed in learning process.

This provides better feed back and gives exact solution for the problems faced by the student in the learning process.

The progress sheet shows each and every student achievement and records his strength and weakness of the students learning activities.

The learning by doing aspect in this assignment method promotes the self confidence and self respect of each and every student engaged in assignment work.

Additional bibliographic information and references provide a good in depth knowledge among the students in the subject they work.

Teacher himself improves his awareness about the students’ achievements.

The student has his own responsibility in learning process.

The experimental works can be done with ease and simple way.

**Supervised study**.

**Supervised study** means a shift from mass teaching to individual or group instruction.

**Supervised study** affords a practical method of teaching pupils what to **study** and how to **study** and to bring the pupils into intimate contact with the teacher and the **learning** process.

The need for supervised study is much higher in the Indian context, with overcrowded classrooms and a tight, heavy curriculum. The classes generally comprise heterogeneous groups with bright, average and below average students in each class. It is, thus impossible for a teacher to cater to individual differences. This situation can be remedied by supervised study. Supervised study allows student to study in the classroom under the direction of the teacher.Group supervised study sessions give the teacher an opportunity to foster good study habits, to deal with study problems, and to relate to students as individuals.

Supervised Study as a Teaching Strategy

Meaning and Definition

Supervised study means the study performed under supervision. In actual practice, when the students engage themselves in some learning activities under the properly organized supervision of the teacher, the phenomenon is labeled as supervised study. It may take either of the two forms-individual or collective.

Bining and Bining (1952) expressed their views about supervised study are, the supervision by the teacher of a group or class of pupils as they work at their desks or around their tables. In this procedure, we find pupils busy at work that has been assigned to them by the teacher. When they meet any difficulty that they cannot overcome, they ask the teacher for direction and assistance. The teacher, when not called upon, walks quietly up and down the classroom or remains at this desk watching the pupils do their work, continually on the alert for any wrong procedures that the pupils may follow. He is always ready to direct and aid them.

How to make use of supervised study a teaching device?

The teacher may ask the students to study general literature related with his teaching subject. This study aimed to collect relevant information about various facts, concepts, principles, events and processes related to the subject. For making the study a planned study, teacher may provide individual or group assignment and then may try to guide the attempts of the students through his able supervision.

The teacher may ask the students to discover facts or principles related to various aspects of his subject through their own independent efforts. The students may take the help of the relevant resources for this purpose and may resort to necessary activities for achieving the desired ends. The teacher will certainly be there to provide needed guidance, direction and supervision to the students for the realization of the set objectives.

In agreement with the nature of the topic and subject proper, students may resort to revision, drill and practice work under the adequate supervision of the teacher. The practical application of the knowledge and skills acquired in the teaching-learning of a subject may be made a subject for study. Students may take individual or group projects for this purpose.

The subjects requiring practical work like physical, and life sciences, art and painting, music, work experiences, etc. may have to enough scope for the utilization of supervised study as a teaching strategy.

**Skills Developed by Supervised study**

Skills as how to read study materials

Skills as to how to use encyclopedias

Skills as to how to use dictionaries.

Skills as to how to use maps, atlases, indexes, and almanacs.

Skills as to how to read graphs.

Requirements of Supervised Study

A big hall

Comfortable seating arrangements.

Study materials.

Assignments and

A self evaluation chart.

**Teacher’s role in providing the study environment.**

**T**ake responsibility for maintaining a pleasant, business like study

environment.

Help students formulate questions to direct their study.

Help students set objectives for the study session.

Locate and select resources in advance which students can use in their study.

Recommend resources to students suitable to their level of ability and understanding.

Direct students to resources which they might not otherwise find or might have difficulty finding.

Help students find pertinent information in the resource materials.

Control environmental conditions such as lighting, temperature, ventilation, and noise, so that students are free from distractions.

Maintain an orderly, business like study setting.

**Organization of Supervised study**

· **Extra class**: The teacher may stay after class and attend to the difficulties of the students or give review or drill and practice to students lagging behind in the class.

· **A Special teacher plan**: A special teacher is employed by the school to sit with students and clarify their doubts.

· **Double period plan**: The school time table is organized in such a way that each subject has two successive periods where one can be used for theoretical work and other for review and drill or related practical work.

· **Divided period plan**: One period may be divided into two parts: one used for theoretical explanations and the other for practical work. This would require that a laboratory be close to the class.

· **Library period plan**: In this period, students may work in the library on work assigned to them by the teacher. The students should be able to use references, prepare bibliographies and evaluate the relative importance of printed materials during a supervised study period. This activity can lead creative thinking.

· **Extra period plan**: An extra period is planned every day where the teacher assigns to each student a list of questions on an assignment sheet which they have to answer and submit.

**Types of supervised study plans**

1. The conference plan

2. The special teacher

3. Supervised study in study hall

4. The divide period plan of supervised study

5. The double period plan of supervised study

6. Supervised study used periodically

7. The general instruction plan

**Advantages of supervised study**

· It makes pupils efficient in solving problem by them.

· It improves teacher pupil relation.

· It helps the teacher to know the abilities of the students.

· It reduces home study task.

· It aids weak students.

· It reduces the failures.

· It develops good habits.

· It develops confidence and self discipline.

· It helps for on the spot correction.

· Democratic human relations are encouraged.

· Increased instructional time is available to pupils.

· Discipline problems can be avoided with less time in transit forstudents.

· A fifty-minute period of time is too short to motivate and teach pupils.

Supervised study gives ample time to grasp the topic well.

· Supervised study can lead gifted and promising students toindependent study.

· The ability to think independently and creatively can be developed.

· It helps the below average student to make up the gap.

· Development of reference skills besides broadening the knowledge base is an outgrowth of supervised study.

**Disadvantages of supervised study**

a. Bright pupils are not helped under this method.

b. Lengthened school day is not possible.

c. It will increase the cost of education.

d. It depends too much on enthusiasm and initiatives of students.

e. It destroys the supremacy of teachers.