

Methods of Science Teaching

The word 'method' has been taken from the Latin word which means mode or way. Therefore here it says, the technique of delivering knowledge and transmitting scientific skills by a teacher to his or her students and their comprehension and application by them in the process of learning science.

According to Valtaire and Spancer, Every method has some goodness in it, and no method is all good. Learners should be told as little as possible and induced to discover as much as possible.

There are some methods in teaching science:

Lecture Method:

This is one of the most popular and oldest methods of teaching in our schools. Lecture means teaching a lesson in the form of speech or talk.

Merits of the lecture method:

- It is highly efficient if a teacher has a systematic and logical manner.
- It is convenient and comfortable, and a teacher is free to develop his/ her style of teaching.
- The number of students can listen and prepare notes. It saves time and energy.

Demerits of the lecture method:

- Most of the time students are inactive.
- Student' involvement and participation is less.

Demonstration Method

Demonstration means 'to show'. Demonstration of experiments provides concrete experiences to students. It includes the use of films, slides, projectors. In this method, the teacher makes a theoretical investigation and proves it in the classroom.

Merits of demonstration method:

- In this method both teacher and students are active.
- It is economical and less time-consuming.
- The students develop the power of observation, reasoning and thinking.

Demerits of demonstration method:

- This method does not provide a chance to all students to experiment.
- It is not based on the principle of learning by doing.
- It does not develop an analytical attitude in children.

Laboratory Method

It is also known as the experimental method. To make the teaching of science meaningful, effective, interesting and clear it is not enough to teach only but providing the opportunity of learning by doing. It is based on the principle of learning by doing. Students are given all necessary materials and equipment in the laboratory along with proper instruments for carrying out their experiments with their initiative and efforts, then they carry on the experiment and record the observation and infer their result. The teacher guides them wherever needed.

Merits of Laboratory method:

- Students learn practical skills and proficiency in handling scientific apparatus and equipment.
- It helps in developing the habit of thinking, reasoning and problem-solving.
- It is a child-centred approach.
- It helps in strengthening the scientific attitude, scientific outlook and scientific temper.
- It paves the way for the exploration, experimentation and verification of scientific facts and principles.

Demerits of Laboratory method:

- It's quite expensive to provide equipment for every child.
- It is very time-consuming.
- Every teacher is not able to use this method effectively.
- It has limited applicability as every concept cannot be taught by this method.

Heuristic Method

The word heuristic has been derived from the Greek word 'Heurisco' which means 'to discover'. A heuristic method is a process of leading the students to find the truth for themselves by independent thinking. This method demands that the students should be allowed to stop and think, discuss and suggest modifications for further experiments. Students cooperate and observe to solve the problem. Here, the role of the teacher is as a guide, facilitator. The teacher helps the child only when he or she had failed to overcome his or her difficulties by his or her efforts.

Merits of the heuristic method:

- It develops the spirit of inquiry in students.
- The student becomes an active participant in the learning process.
- It promotes the habit of self-study, self-dependence, etc.
- The knowledge obtained is more stable.
- The student's observation is developed and his thinking ability is enhanced.

Demerits of Heuristic method:

- Teaching the students of lower age through this method is difficult.
- It demands extraordinary labour and special preparation from the teacher.
- It's very time consuming and expensive.
- This method is not suitable for a class having a more substantial number of students because it demands individual attention to all students by a teacher.

Observation Method

In the observation method, students observe and acquire knowledge. With observations, students could be able to see nature in their surrounding. Consideration involves looking and listening very carefully.

Merits of the observation method:

- The relation between teacher and student becomes intimate and healthy.
- The students observe and understand the similarities and dissimilarities of objects clearly and efficiently.
- Students become self-dependent, self-reliant and confident.

Demerits of the observation method:

- It is not practicable, i.e. the practical part of it remains underdeveloped.
- Cultural and language barrier might be involved.
- Data collection is quite difficult.

Project Method

The project method involved investigation, discovery and finding out something which was not known to the student before. Here the student has to decide what experiments are necessary and how he is going to carry them out. The student will act like a scientist. In this method, a problem is posed to the students, and they find a solution to it.

Merits of project method:

- Students remain active throughout the execution of the project.
- They develop qualities of patience, contentment and satisfaction.
- It is based on the principle of learning by doing.
- They will be able to create a relationship between the various subjects.

Demerits of project method:

- It is very time-consuming.
- It is costly.
- The whole syllabus cannot be taught through this method.
- In this method, teaching and learning become disorganised, irregular, and discontinuous.

Problem-solving Method

The problem-solving approach is the result of necessity. The problem should be placed in front of the students in clear words and should be according to the understanding experiences of the students. Students will be asked to do analysis and synthesis of the problem with the help of the teacher and try to find the solution.

Merits of the problem-solving method:

- Students learn to find the solution of their problems themselves.
- They develop the power of observation and argumentation.
- They get the opportunities to know the process of collection of data evaluation and drawing inferences.

Demerits of the problem-solving method:

- It is a time and energy-consuming method.
- It is not suitable for the lower classes.
- This method is ideal for highly talented students and teachers.