



Effective implementation of lecture demonstration method for teaching science

Dr. Monika Davar

Assistant Professor, Department of Education, Maharaja Surajmal Institute, Janakpuri, New Delhi, India

Abstract

Lecture cum demonstration method includes the merits of lecture method and demonstrations method. The teacher performs the experiment in the class and goes on explaining verbally what he does. The students observe critically and may even help the teacher in performing the experiment and try to draw inferences. It is a very important method of teaching science, particularly when adequate apparatus isn't available and when the experiments are dangerous and difficult. Hence the need of the study. Aim of the study is to discuss the guidelines for effective implementation of lecture demonstration method and illustrate its use in the classroom situation. The paper discusses the guidelines and steps for effectively implementing lecture-demonstration method for teaching science. This is followed by an illustration of this method.

Keywords: Lecture demonstration method, effective implementation

Introduction

Lecture method refers to the teaching procedure which involves verbally explaining some theoretical elements of the course content to the students. This method is used to motivate, clarify, explain and review the information. Demonstration involves explanation of a concept, by performing an experiment. Demonstration can also be a practical display of a piece of equipment to show its capabilities. It involves showing what or showing how certain phenomenon or process occurs. Lecture cum demonstration method includes the merits of lecture method and demonstrations method. The teacher performs the experiment in the class and goes on explaining verbally what he does. The students observe critically and may even help the teacher in performing the experiment and try to draw inferences.

It is a very important method of teaching science, particularly when adequate apparatus isn't available and when the experiments are dangerous and difficult. Hence the need of the study. Aim of the study is to discuss the guidelines for effective implementation of lecture demonstration method and illustrate its use in the classroom situation.

Guidelines for a Good Demonstration

- The demonstration should be well planned and rehearsed in advance. This enables the teacher to find out the difficulties and ensure a successful demonstration in front of the students.
- The apparatus used for the demonstration should be big enough to be seen by the whole class.
- The teacher should be clear about the objectives of the demonstration. He should proceed with the demonstration keeping the objectives in mind.
- The demonstration should be directly related to the topic being taught in the class.
- All the pieces of the apparatus should be placed in order before starting the demonstration.
- Some spare apparatus should also be available to fall back upon. Spare apparatus may be needed in case the apparatus being used does not work or breaks during demonstration.
- The demonstration should be visible to all students. To facilitate this, the demonstration table should be at a little higher level than the students' tables.
- Making students sit in a semicircle around the demonstration table will also improve visibility. Proper care should be taken for adequate lighting of the demonstration table.
- Demonstration should be speedy and in accordance with the mental level of the students. Reflective type of questions suited to the level of the students should be asked during the demonstration. It will stimulate curiosity and reasoning among students.
- Demonstration should involve active participation of the students. Teacher should discuss the various aspects of the demonstration. Some students may be called to help in performing the experiment.
- Students should be free to ask questions and clarify doubts during and after the demonstration.
- Teacher should motivate the students to derive the conclusion rather than telling it directly.
- Demonstration should be in accordance with the time and season of the year otherwise it will prove a failure. For example, performing a demonstration related to humidity during the dry summer season may prove to be a failure.
- Demonstration should provide opportunities to students not only to observe but also hypothesize, analyze, infer and develop other higher order thinking skills.
- Demonstration can be supplemented with other teaching aids like showing a film, slide show or transparencies to bring clarity and make it more real.
- Teacher should adapt a heuristic approach throughout as he carries out each step of the demonstration. Students should reflect on each step rather than teacher giving direct explanation.
- Teacher should write the main points and results of the demonstration on the blackboard. This should be done after discussion with the students.

Steps of a Lecture Cum Demonstration Lesson

1. Planning and Preparation

The teacher should prepare his lesson plan. It should include the objectives, concepts to be explained and experiments to be demonstrated. The questions to be asked from the students should also be planned. The experiments should be rehearsed under the conditions prevailing in the classroom.

2. Introduction of The Lesson

The teacher should introduce the lesson in a motivating and interesting way. A problem may be presented before the class, the solution of which needs to be found through experimentation. There can be a discussion regarding the problem and its solution. This will incite curiosity and develop reasoning skills amongst the students.

3. Presentation

The lesson should be presented in an interesting manner. The teacher should use examples and illustrations related to daily life. Teaching aids (slides, charts, models, etc.) relevant to the lesson may be used. The experiments should be demonstrated at an appropriate time during the presentation.

4. Performance of Experiment

The teacher should conduct the demonstration with the help of the students. He should ask them questions at each step to ensure that students observe the essential features carefully. The teacher should also motivate the students to think about 'how' and 'why' of the activity conducted. The teacher should finally guide the students to infer the result and arrive at a generalization.

5. Blackboard Summary

The essential points of the lesson including the purpose of the demonstration, the steps and finally the result should be listed briefly on the blackboard.

Illustration of Lecture Demonstration Method

The teacher wants to demonstrate that CO₂ dissolves in water to produce carbonic acid. He proceeds as follows:

1. Planning and Preparation: The teacher prepares a lesson plan to fulfill the objective 'To demonstrate that CO₂ dissolves in water to produce an acid'. He lists down the teaching aids and apparatus to be used. The teacher also plans the questions to be asked and rehearses the experiment beforehand.

2. Introduction: The teacher poses a few questions to students of class VII:

Q.1) What do we breathe out during respiration?

The students expected response - CO₂

Q.2.) Is CO₂ able to dissolve in water?

Students may guess 'Yes' or 'No'

The teacher motivates them by saying, 'Shall we find out the answer by doing an experiment?' The students get curious and excited to find out the answer.

3. Presentation: The teacher discusses the use of CO₂ in soft drinks and shows a chart to explain the experimental setup to be used for the demonstration.

4. Performance of Experiment: The teacher sets up the apparatus on the demonstration table and asks the students to sit in a semicircle around the table. The teacher performs the demonstration as follows:

Experiment 1

The teacher inverts a gas jar containing CO₂ on a trough of water.

He calls a student to check the level of water in the jar and note the reading. After sometime, the teacher calls another student to observe the new reading and note it on the blackboard.

The teacher asks the students, "What does this change in the reading indicate?" Students reply 'water level has changed'. Teacher asks again, 'Why has the water level changed?' Students reason out that some CO₂ has dissolved in water, so water level has gone up. Teacher confirms this correct response.

Experiment 2

Teacher asks again, 'How can we check whether the solution of CO₂ in water is basic, acidic or neutral?' Students already know the use of litmus paper to check acidic and basic nature of a substance and suggest that they can use litmus paper.

One student is called to dip red litmus paper in the solution. Teacher questions, 'Does red litmus turn blue?' Students reply 'No'. Teacher's question, 'What does it indicate?' Students reply that the solution is not a base. Another student is asked to dip a blue litmus paper in the solution. The teacher shows the paper to the whole class and asks, 'What do you observe?' Students reply, 'The blue litmus paper has turned red'. Teacher asks, 'What does it indicate?' Students reply, 'It indicates that the solution is acidic.'

Blackboard Summary: It is developed by the teacher alongside the presentation in the following manner:

Problem I - Does CO₂ dissolve in water?

Apparatus set up: An inverted gas jar containing CO₂ in a trough of water.

Test -Initial level of water - ____; Final level of water after 10 minutes- ____

Observation: Water level has gone up.

Conclusion- Some CO₂ has dissolved in it.

Problem II – Is the solution formed basic, acidic or neutral?

Test – (1) Dip red litmus paper in the solution

(2) Dip blue litmus paper in the solution.

Observation- (1) Red litmus – No change in colour (2) Blue litmus- It changes into red

Conclusion- Solution is acidic

It fails to impart training in scientific method.

Conclusion

Lecture demonstration method is particularly useful in schools with inadequate apparatus, difficult or dangerous experiments which are not advisable to be performed by the students. Teacher can demonstrate the experiment and ask relevant inquiry-based questions to students. Of course, it cannot replace hands-on experiences but can clarify the concepts, enhance students' scientific attitude and inquiry skills and is a better method compared to the teacher centred lecture method.

References

1. Deepa AS. Comparative Study on the Effects of Lecture Method and Demonstration Method on the Achievement of SSII Students in Biological Science. *Educational research and review*,2012;7(5):54–60.
2. Carrier K. Key issues for teaching learners in the classrooms. *Middle School Journal*,2006;37(4):17–24.
3. Kresta S. Hands on demonstrations: An alternative to full-scale lab experiments. *Journal of Engineering Education*,2011;87(1):7–9.
4. Maizuwo AI. Effects of Demonstration Teaching Strategy in Remediating Misconceptions in Organic Chemistry among Students of Colleges of Education in Kano State, 2011.
5. Obunadike. Comparative Study of the Influence of Lecture and Demonstration Methods on the Teaching of Agricultural Science in Senior Secondary Schools. *Educational research and review*,2014;9(2):30–6.
6. Alao S. Towards Effective Teaching and Learning of Integrated Science at Junior Secondary School Level. *Nigeria Journal of Educational Studies and Research (NJESR)*,2010;6(87):32–8.
7. Agboola S, Oloyede EO. Effects of project, Inquiry and Lecture-Demonstration Teaching Methods on Academic achievement on senior secondary in Separation of mixtures. *Educational research and review*,2007;2(6):124–30.