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A Study on Status of Inference Skill in Science among VIII Standard Students

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Abstract: *Teaching of science is not only to transact the knowledge into students mind. Teachers must engage the learner in “doing science” and “experience the science” such learning experiences develops process skills of observation measurements prediction inferences and hypothesis etc. Inference is one of the higher order thinking skill wherein upper primary students supposed to derive inferences by their own after observation of experiments. But due to sub-standard of science teaching, students unable to derive inferences because they are not proficient in inferences skill. Scientific concepts to be constructed by learner, not always to be instructed by teacher. If the students are proficient in inference skill, they can able to construct the concepts. Present research study findings reveals that the upper primary students’ inference skill is not proficient due to conventional method of teaching and no innovation in science teaching, hence it’s a high time for the teacher to develop inference skill among upper primary students.*

I. INTRODUCTION

It is well known that science is highly creative and dynamic subject. Science provide opportunity for the students to develop inquiry skills, critical thinking, creativity, problem solving, decision making skills etc. It was stated by NRC (1996) and American Association and Advancement of Science (AAAS, 1989; 2000) that scientific literacy is one of the foremost goals of science education. Nation vision and expectation is that everyone to become scientifically literate citizens. Science education at School especially science teaching play important role in preparing the students become literate citizens, The outcome of science teaching in schools should be make the students to understand the basic scientific concepts, facts and principles, process skills/methods, to develop scientific attitude, and apply the basic scientific concepts and skills in their daily life. Science teaching in schools was dominated by facts, principles, laws, theories and concepts. Much importance was given to products of science than process of science. Process of doing science such as experimentation discoveries investigation inquiry demonstration problem solving are rare events during the teaching learning process therefore students far behind in process of science and process skills, students unable to derive inferences even after observing the experiments. Merely they expect clarification of concepts from teacher or learn the concepts from textbook. Such practices hinder student’s higher order thinking skills. Inference is one of the higher order thinking skills should possess by upper primary students but due to unsatisfactory scenario of science teaching students lacking behind in inference skill. There is an association between observations and inferences. Observation is the basis for deriving inference but the research findings reveals that students could not come to conclusions about experiments. Inference is the act of making statements based on observations. Inference is a process of making suggestions, conclusions, assumptions or explanations about a specific event based on observation. Inference is different from observations, observation is the use of one’s senses to perceive objects and events and their properties. Inferences are making statements or conclusions after a deep observation and understanding of a phenomenon. Sometimes more than one inference can be made based on a list of observations. Inference skill encourages metacognition process and it stimulates higher order thinking skills, problem solving skills and decision making skills. Inference helps to identify the Cause and effect relationship. Students at upper primary stage are in a position to derive inference by own but it is unfortunate that most of the students completing their secondary education with no proficiency in inference skill due to unsatisfactory scenario of science teaching. Hence the researcher conducted a study to know students inference skill status in one of the upper primary school in Tamilnadu with the following objectives.

II. OBJECTIVES OF THE STUDY

To Study the existing status of inference skill in science among VIIIth standard students.

To study the status of science teaching and its influence to develop inference skill at VIIIth standard students.

To study laboratory facilities for students to develop inference skills.

A. Research Questions

- 1) To what extent students of standard eight proficient in inference skill in science?
- 2) Whether the science teaching and laboratory facilities facilitate the students to develop inference skill?

B. Design Of The Study

Design of the study was case study method. Case for the present study was 28 students of Gudalur Government Higher Secondary School situated in Gudalur Taluk, Nilgiri District, Tamilnadu.

C. Statement Of The Problem

VIII Standard Students Prediction Skill Status in Science: A Case Study

D. Explanation Of The Term

- 1) *Prediction:* Predictions are the statements about what might happen or could be expected to happen in the future. It is based on some relevant prior knowledge in a form which can be investigated. Prediction is the act of predicting the forecasting events based on a previously developed model or experience. A prediction is not a wild guess; a guess has no rational foundation. Predictions are kinds of thinking that require learners' best guesses based on the information available to them.

E. Delimitation of the Study

- 1) Study was delimited to prediction skills in science.
- 2) Study was delimited to students of standard eight in the academic year 2011-12
- 3) Study was delimited to Gudalur Government Higher Secondary School situated in Gudalur Taluk, Nilgiri District, Tamilnadu.

F. Sample and Sampling technique

Students of standard VIII (English Medium) from Gudalur Government Higher Secondary School in Gudalur Taluk, Nilgiri District, Tamilnadu were the Sample. The sample comprised of 28 students (7 Girls and 21 Boys) and the purposive sampling method was adopted.

G. Data Collection

Data was collected by the researcher by administering the following tools and techniques after validation of experts. The brief descriptions of administration of tools and techniques are as follows.

- 1) *Open ended Questionnaire:* An open ended performance based test was administered for the sampled students. The test consist of sixteen items to test students' inference skill. There were many experiments performed by researcher and students, based on the experiments students asked to draw inferences. Similarly, there are some pictures in relation to science were shown and asked to write inferences.
- 2) *Close ended Questionnaire:* This test has been administered to know their knowledge about inference skill in science.
- 3) *Rating Scale:* Four point (always, sometimes, most of the time and never) rating scale was administered in students. This test has been conducted to know whether the students made any attempt to draw the inference in science.
- 4) *Observation Technique:* Participatory observation technique has been followed at the time of administration of inference skill and the same was recorded in the field note.
- 5) *Video graphy and Photography:* Video graphy and photograph was made by the researcher at the time of administration of performance based test.

H. Data Analysis and Interpretation

The data was analysed qualitatively by using rubric, content analysis, frequency percentages, and triangulation of data.

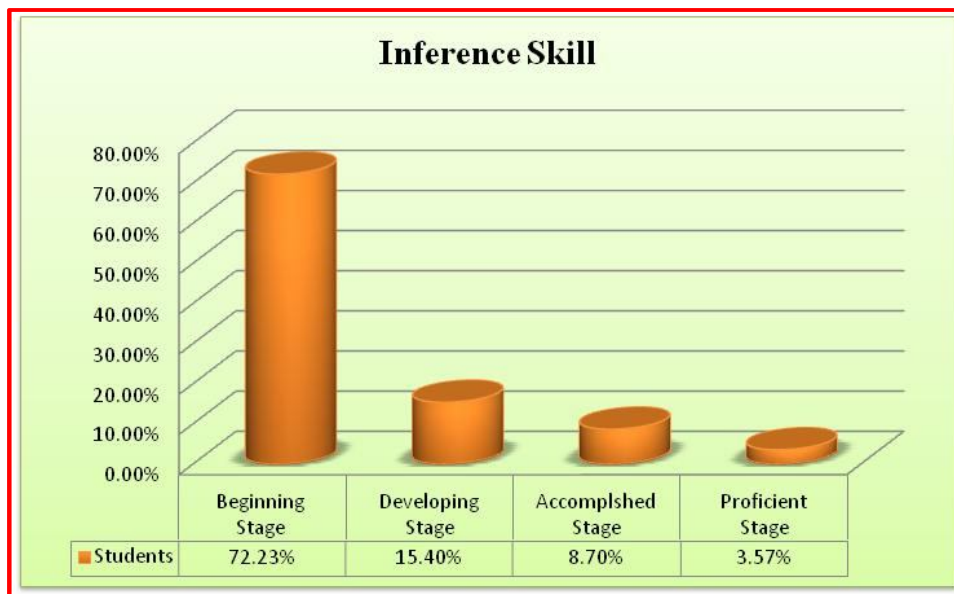
I. Major Findings

The table shows item wise Inference skill status.

Item No	Parameters of Inference skill	% of Students in Beginning Stage	% of Students in Developing Stage	% of Students in Accomplished Stage	% of Students in Proficient Stage
1.	Inference based on observation of melting of ice cubes in thistle funnel with thermometer.	(17) 60.71%	(05) 17.85%	(05) 17.85%	(01) 3.57%
2.	Inference based on observation of photosynthesis picture.	(22) 78.57%	(05) 17.85%	-	(01) 3.57%
3.	Inference on Soluble and insoluble substances in water.	(19) 67.85%	(06) 21.42%	(01) 3.57%	(02) 7.14%
4.	Inference based on observation of acid and base test.	(25) 89.28	(03) 10.71	-	-
5.	Inference on transfer of heat in solid (iron rod experiment)	(18) 64.28%	(04) 14.28%	(03) 10.71%	(03) 10.71%
6.	Inference on solar eclipse and lunar eclipse	(13) 46.42%	(07) 25%	(03) 10.71%	(05) 17.85%
7.	Inference on observation of transpiration picture	(22) 78.57%	(03) 10.71%	(03) 10.71%	-
8.	Inference based on floatation of different liquids in water.	(25) 89.28%	(02) 7.14%	-	(01) 3.57%
9.	Inference based on absorption of heat by empty inflated balloon, & absorption of heat by inflated balloon with water when brought over the lighted candle.	(15) 53.57%	(05) 17.85%	(07) 25%	(01) 3.57%
10.	Inference based on Simple pendulum experiment.	(22) 78.57%	(04) 14.28%	(02) 7.14%	-
11.	Inference based on observations of water droplets on outer surface of the steel tumbler.	(17) 60.71%	(08) 28.57%	(02) 7.14%	(01) 3.57%
12.	Inference based on observation of experiment on neutralisation of acid base test.	(24) 85.71%	(03) 10.71%	(01) 3.57%	-
13.	Inference based on change of states of matter (Melting, Sublimation and Vaporisation)	(25) 89.28%	(01) 3.57%	(02) 7.14%	-
14.	Inference on anomalous expansion of water in pond	(25) 89.28%	(02) 7.14%	(01) 3.57%	-
15.	Inference on food Chain between different organisms	(09) 32.14%	(09) 32.14%	(09) 32.14%	(01) 3.57%
16.	Inference on different types of levers	(26) 92.85%	(02) 7.14%	-	-
Overall Performance		72.23%	15.40%	8.70%	5.57%

The

following graph shows the overall performance of Students in Inference Skill



J. The following observations can be derived from the graph 4.6.

- 1) 72.23% students' inference skill was in beginning stage wherein students could not derive any inferences based on observations of picture, experiment, demonstration and videos, instead they wrote observations (Picture_4.5). Also students unable to differentiate between observation and inferences.
- 2) 15.40% students' inference skill was in developing stage wherein students' derived very few inference(s) correctly based on observations of picture, experiment, demonstration and videos. However they wrote more observations from the pictures and experiments.
- 3) 8.70% students' inference skill was in accomplished stage wherein students derived most of the inference(s) correctly based on observations of experiment and pictures. However few inference(s) not derived, instead students written few observations.
- 4) 3.57% students' inference skill was in proficient stage wherein students derived inferences correctly and completely based on observation of picture experiments videos. Also Students able to differentiate between observations and inferences.

From the above observations, it can be inferred that most of the students' inference skill was beginning stage; very less students proficiency in inference skill.

K. Findings with regard to status of science teaching and Laboratory Facilities

- 1) Findings reveals that the teachers' largely adopt lecture method in the classroom, rarely teachers use demonstrate the experiments in the classroom. Hence students very weak in inference skill.
- 2) Teachers teach only in the classroom, sometimes students have been taken to laboratory for observing the scientific instruments however students have not done any experiments by their own therefore they are very poor in inference skill.
- 3) Teacher occasionally demonstrate the experiments in the classroom. However after completion of experiments Students unable to draw inferences.
- 4) Findings reveals that teacher not facilitated the students to demonstrate any experiments, hence their inference skill very beginning stage.
- 5) There was a separate laboratory for upper primary students with minimum scientific equipment's, however some of the scientific equipment are working and some are nor working conditions.
- 6) Findings reveals that there a need of more number of scientific equipment for developing process skills especially inference skill.

L. Suggestions

- 1) In order to develop inference skill, teacher should follow demonstration method, learning by doing method, experiential learning method etc.
- 2) Teacher need to provide variety of hands on learning experiences to develop inference skill.



- 3) Teacher should facilitate the students to engage in different experiments for developing inference skill.
- 4) Lecture method of teaching science should not be followed to develop inference skill.
- 5) School should have laboratory facilities with complete lab-equipment.
- 6) Teacher need to give more scope for students to draw inferences by their own. Students should observe the pictures, diagram and experiments and they should make an attempt to draw inferences.
- 7) Teaching should not confined to classroom, teaching should take place in field, ICT lab, immediate learning environment in the school, library, laboratory such practices help the students proficient in inference skill.

III. CONCLUSION

Concepts and skills can be effectively constructed when the students engaged in science. Students interestingly perform experiments. Science is not to be taught by verbal method. Instead, emphasis is on first hand experimentation and observation. Knowledge of science is hollow if concepts are not properly understood and skills are not acquired by the learner. Scientific knowledge should be self-discovered by the students through process of science. There is a strong relationship between process skills and concepts. Inference is one of the process skill wherein students of upper primary supposed to be proficient but the present research study findings reveals the bad picture of students inference skill, it may be due to poor scenario of science teaching. Hence the teaching of science should stress more on the developing process skills as whole and exclusively the inference skill.



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