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## “EFFECTIVE STRATEGIES APPLIED IN TEACHING OF PHYSICS AT THE HIGHER SECONDARY LEVEL IN WEST BENGAL”

<sup>1</sup> Somnath Gupta

<sup>1</sup> Research Scholar

Department of Education

Ram Krishna Dhramarth Foundation (RKDF) University, Ranchi

E-mail: [somnath\\_gupta007@yahoo.co.in](mailto:somnath_gupta007@yahoo.co.in)

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### Abstract:

Science is a common part in the curriculum of school education and it is also subdivided into many wings of science such as physics, chemistry, Bio-science and soon after the secondary level of school education of the Bengali medium students in West Bengal. The present study is based on the effective teaching strategies followed by the school teachers at the higher Secondary level for specifically teaching of the subject physics. The study will try to investigate the strategies and their fruitfulness in relation to the stakeholders (learners).

**Keywords:** Science, Teaching strategies, stakeholders

### I. INTRODUCTION

Introduction: A learner who wants to have science teaching at the very beginning he/she doesn't come to a science classroom without any knowledge of science that is like a blank slate. Rather based on their daily experiences, observations, worked activities and so on they

\*Corresponding Author: Somnath Gupta

E-mail: [somnath\\_gupta007@yahoo.co.in](mailto:somnath_gupta007@yahoo.co.in)

gather required practical knowledge for the purpose of defining various events phenomena occurring continuously around their daily life style. It is true that all the ideas acquired by them not be always as perfect as scientific ideas because of various unscientific misconceptions prevailed around them from earlier. But a science teacher however will not less interested person in listening their primary

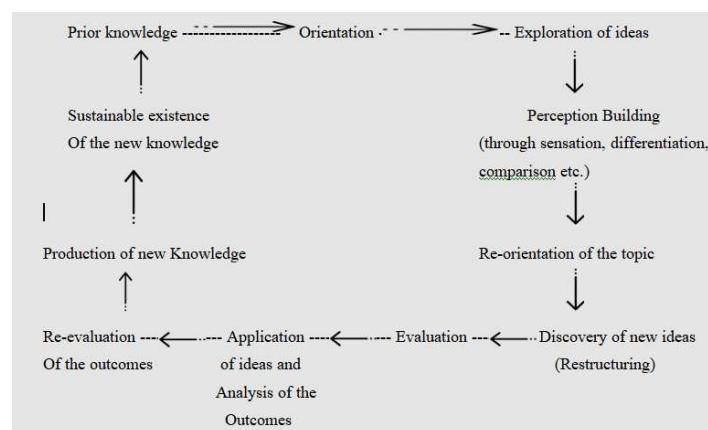
experiences rather he/she will be interested in listening and will be able to make them to be suited in accepting the proper scientific ideas in replacing their prior knowledge based on their experiences which had been constructed through prevailed misconception in society. So, it may be stated that a teacher must follow the most effective strategies during his/her teaching in the classroom as learning is viewed as an vigorous interaction between the learner's experience and his/her learning environment. Here the prior knowledge acts as the born give basis a new effective knowledge. Here the present study will be involved to find out effective teaching strategies in teaching physics and to evaluate its specific values in developing the quality of teaching physics so that the subject be interesting and helpful for learners as well as our society.

### Objectives of the Study:

- To develop strategies in teaching Physics in relation to observation, classification, communication, measurement along with its destination and prediction.
- To built up in scientific attitude with development of the skills in problem solving ability.
- To built up logical thinking ability to draw conclusions of any scientific experiment among the learners.

- To increase the communication power of learners to relate the physics with physical world exists in the society.
- To foster creativity to cultivate new scientific ideas.
- To acquire adequate scientific knowledge to establish generalisation of any scientific experiment and then to apply that in solving daily life problems.

### Innovative strategies frame work:



**Constructivism:** In constructivism learners construct knowledge through active engagement in learning situation and try to compare that knowledge with the theoretical bookish knowledge. These are mainly two types of constructivism present in our psychological domain, one is cognitive constructivism of Jean Piaget (1977) and the other is social constructivism by Lev Vygotsky (1978, 57). In cognitive constructivism knowledge is constructed through mental negotiation, schema expansion through conservation of thought, logical thinking and concrete reasoning.

Hence the new knowledge is being assimilated to the existing schema of knowledge which is experience based prior knowledge hence a teacher must support and guide his/her students to expand their existing schema through assimilation as well as required accommodation.

In social constructivism, society has a great role to construct knowledge. Pioneer of this thinking, Lev Vygotsky, instead of being a cognitivist he denied to accept the theory of Piaget & Perry that construction of knowledge of learners was possible without any kind of interaction of society. He opined that all intellectual cognitive thinking come out from the societal interactions that is knowledge is socially cultivated then mutually negotiated. So, it is necessary for a teacher of physics during his/her teaching in class room that he /she must support the learners to be well acquaintance with the surroundings where they can interact with various learning situations exist in their society. In this way a learner must be able to construct his/her knowledge needful for structuring and restructuring knowledge.

### **Effective pedagogic strategies for teaching physics:**

#### **Using Analogies:**

During teaching physics a teacher must provide examples to support learners to built up the effective ideas so that a learner can relate the objectives of the teaching to

another phenomena happened in their lives.

### **Grouping learners through entry level knowledge gaps:**

As the learners of a class possess varying amounts of knowledge in separate stages of the physics syllabus so a teacher must evaluate that gaps to conduct post tests before his/her teachings of that material.

**Peer Group formation:** Peer group learning is very effective and comprehensive concept in teaching physics. Relatively better students can play role of a temporary guide to one of his/her friends. As a result in this two –way process both members of the group will be benefited.

**Joyful class room:** In teachings physics a teacher must prepare teaching learning materials in such a way that the learners be motivated to be involved in teaching learning process and be engaged in preparing improvised apparatus related to the content taught. In a word the environment of the classroom will be joyful in nature.

**Laboratory method:** This is very effective and suitable teaching method in teaching physics and other science subjects in relation with observation, patience and experimentation with objects, materials. So this method is suitable one for teaching physics.

**Simulation:** It is one kind of role playing teaching strategy that helps learners to realize the ground reality into classroom. It

helps learner to think over a matter in most logical ways which help to learn physics.

**Team teaching strategy:** This is very effective teaching strategy in teaching physics. Here a two or more teachers act as a group to satisfy a common objectives of a specified content for a specified groups.

**Project Based teachings strategy:**

This teaching strategy helps learners to go into deeper of a given content of topic through active engagement in preparing journal, student podcast, science based poster, writing research journal and so on. Through the strategy a physics learner can reach at his/ her optimum potential that helps him/her to carry on with the subject.

**Programmed learning strategy:**

This is a very effective and research based learning strategy which has been developed in consideration with Skinnerian principal of operant conditioning. In this process a learner can go forward through small steps, active participation with simultaneous response, proper reinforcement, self-pacing, self-evaluation, proper feedback and so on which must help a learner to face an unknown situation of any content matter of physics from known one. So, these sequential steps of this process may be fruitful in teaching physics too.

**Conclusion:** The Current study indicates that for proper and effective teaching of physics a teacher must be aware about the prior knowledge of learners coming from

different social, economical, psychological, geographical background. After that a teacher will enclose the suitable strategy in teaching physics. He/she must try to correlate the prior knowledge of learners with new content knowledge through active engagement of the learners rather than only transmission of knowledge and thus a learner must be able to find out the way to be enriched as well as a self knowledge creator.

Besides these all strategies, there are many effective strategies in physics' such as brain storming, experiential learning, co-operative and collaborative learning, flipped learning, discovery method, anchor instruction, assignment based teaching learning and so on which all are more of less competent in teaching physics too. As a teacher of physics, one can follow the discussed strategies according to the learner's need, choice, knowledge gap, thinking and problem solving ability etc.

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