



Problems Encountered by Higher Secondary Students in Learning Physics

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ABSTRACT

The achievement and the benefits of science touch all sectors and all levels of the modern society. Physics is playing a major role in the present age to satisfy the needs and desires of the people and it has also become one of the major human activities. Physics lies at the heart of sciences. The aim of physics teaching is acquisition of information and skills and to attain understanding of the relationship which relates the answer to the problem. The task of teaching learning of physics at the higher secondary level has become more complex. Thus most of the rules and procedures of mathematics are directly applicable to the understanding of physics. The present study has been focus to identify the problems of physics students in learning and rectify the same by giving suggestions to them at higher secondary level. The study is carried out on a sample of 250 higher secondary students who are studying physics as one of the subject in the Karur district of Tamilnadu, India. The findings revealed that the higher secondary students facing more and higher level problems in learning physics concepts; there was no significant difference in experiencing problems in learning physics in terms of their studying class(Standard XI and XII) and locality, but they were significantly differs in gender and nature of school.

KEYWORDS :

INTRODUCTION

Physics has made a tremendous impact on the cultural life of the present day society which is a product of science. The thinking, feeling and actions of a modern man are practically guided by the effect of physics. The study of physics brings behavioural change in the learner and enriches his character and personality. Physics gives opportunity for creative thinking and constructive imagination. Further, it is a subject where ideas can be experimented upon and verified. The learner develops the habits of searching for the truth and it affect the pattern of behaviour of the learner. The students can apply this skill to solve problems in his personal and social life. Physics lies at the heart of sciences. The progress of physics determines the possibilities of development in wide range of sciences.

AIMS OF PHYSICS TEACHING

The aim of physics teaching is acquisition of information and skills and to attain understanding of the relationship which relates the answer to the problem. The task of teaching learning of physics at the higher secondary level has become more complex. The excitement and diverse possibilities of physics must be infused into the minds of the pupils in an appropriate, interesting and dynamically evolving way. The conventional way of teaching – learning physics is considered as a passive of gaining and storing a specific quantum of knowledge in the form in which it is presented.

The physics teaching should emphasize processes rather than facts, such as performing experiments, taking observation, collecting data, objectives analysis and classification of data, objectives analysis and drawing inferences. These process skills help in changing attitudes and values that make up the scientific temper among the learners. The teachers' duty will not be mere the transmit of information but more of a facilitating of learning. Physics learning provides a lot of problems solving situations and it has a great intellectual value. It helps to develop the habit of critical observation among students. Physics helps in reporting things and events without bias. This helps in promoting intellectual honesty among students. Study of physics develops the positive attitude like open mindedness, reasoning, weighing evidences and unbiased thinking.

STUDENTS PROBLEMS IN LEARNING PHYSICS AT HIGHER SECONDARY LEVEL

The basic training in experiments virtually starts once the students enter the higher secondary levels. The approach towards the handling of the experimental problems that differ significantly from that of the theoretical ones is another kind that does not get highlighted even at the higher secondary level. The main stress remains in doing the experiments in the curriculum and getting the "right result" in the pro-

cess as the students are trained to perform the experiments knowing only 'hows' and not bothering about the 'ways' of the experiments.

Physics is concerned with the interaction among objects on believes that interact according to certain laws are almost always quantitative. It becomes essential to trace quantitative logical connections in studying physical system. The rules governing all such connections are the subject of mathematics. Thus most of the rules and procedures of mathematics are directly applicable to the understanding of physics. Physics require tools of mathematics which is used on physics because in all, except the simplest situations, it provides by far the most convenient way to trace the logical relationships that arise in the analysis of physical system. Students have difficulty in differentiating the more concepts in the physics.

NEED OF THE STUDY

While learning physics concepts, students simply memorized the formulae and reproduced them in the answer paper. They are in a position to explain the meaning of the symbols that are given in formulae and at the same time, the students could not explain the meaning as they find difficulties in learning the concepts of physics. So the investigator is interested to find out the problems in learning physics for the higher secondary students.

OBJECTIVES OF THE STUDY

The following objectives are framed by the investigator.

- 1) To find out the intensity of the problems encountered by the students in learning physics concepts.
- 2) To find out the significant difference if any between the various groups of biographical variables in experiencing the problems of Higher Secondary students in learning physics concepts.
- 3) To give some remedial measures to solve the problems of Higher Secondary students in learning physics concepts.

HYPOTHESES OF THE STUDY

The following hypotheses were framed by the investigator for the present study

- i) The intensity of the problem encountered by the students in learning physics concepts at higher secondary level is found to be at high level.
- ii) There is no significant difference between the mean scores of boys and girls higher secondary students in respect of their problems in learning physics.
- iii) There is no significant difference between the mean scores of rural and urban higher secondary students in respect of their problems in learning physics.

- iv) There is no significant difference between the problems in learning physics of higher secondary students in terms of their type of school.
- v) There is no significant difference between the mean scores of higher secondary students studying in the standard XI and XII standard in respect of their problems in learning physics.

METHODOLOGY

The present investigation was undertaken by using normative survey method. The methodological details like sample, tools used, procedure of data collection, scoring procedure and statistical techniques are given below.

SAMPLE

The sample of the present study consisted of 250 higher secondary students who are studying physics as the one of the subject in standard XI and XII at higher secondary schools situated in Karur district of Tamilnadu, India have been chosen through simple random sampling technique.

TOOLS USED

In the present study the investigator used questionnaire on identification of problems of students in learning physics concepts at higher secondary level. Problem in Learning Physics questionnaire was developed by the investigator. The final form of the problem in learning physics questionnaire consists of 40 items. The maximum score for this tool is 120 and minimum score is 40. Each item in this scale get against three alternative response, they are "greater extent", are "lesser extent" and "not at all" and carried out the score 3, 2 and 1 respectively. The reliability of the tool by split-half technique followed by the use of Spearman-Brown Prophecy formula is found to be 0.56. In this process the investigator used content validity based on the opinion of the expert.

STATISTICAL TECHNIQUES USED

In the present study, the statistical techniques such as descriptive (Mean and Standard Deviation) and differential analysis ('t' test) were used.

ANALYSIS AND INTERPRETATION

**Table – 1
PERCENTAGE SCORES OF HIGHER SECONDARY STUDENTS IN EXPERIENCING PROBLEMS IN LEARNING PHYSICS CONCEPTS**

Category	Maximum Score	Obtained Score	Percentage
Overall	30000	24287	80.95

The Table-1 reveals that 80.95% of students faced problem while learning in physics concepts at higher secondary level. Hence, it can be inferred that the maximum number of students face problem because the subject content is not up to their comprehension level.

**Table – 2
DIFFERENCE BETWEEN THE MEAN SCORES OF PROBLEMS IN LEARNING PHYSICS OF BOYS AND GIRLS HIGHER SECONDARY STUDENTS.**

Gender	N	Mean	SD	Calculated 't' Value	Level of Significance
Boys	166	94.475	13.0743	4.4484	Significant at 5% level
Girls	84	102.88	14.607		

Table-2 reveals that the obtained't' value of the higher secondary students in terms of their gender are higher than the critical value 2.58 at 0.05 level of the significance. There exists difference between the mean scores of boys and girls students in experiencing problem at the time of studying physics concepts at higher secondary level. Hence it can be inferred that the girls experiences problem related to physics concepts is greater than that of the boys.

**Table – 3
DIFFERENCE BETWEEN THE MEAN SCORES OF PROBLEMS IN LEARNING PHYSICS OF RURAL AND URBAN HIGHER SECONDARY STUDENTS.**

Locale	N	Mean	SD	Calculated 't' Value	Level of Significance
Rural	113	97.314	14.710	0.0588	Not significant
Urban	137	97.434	17.574		

Table-3 reveals that the obtained't' value of the higher secondary students in terms of their locale are less than the critical value 1.96 at 0.05 level of the significance. So, there is no significant difference between the mean scores of rural and urban students in experiencing problem at the time of learning physics concepts. Hence it can be inferred that the Students studying in rural and urban areas are experiencing problems in learning physics concepts are found to be equal.

**Table – 4
DIFFERENCE BETWEEN THE MEAN SCORES OF PROBLEMS IN LEARNING PHYSICS OF HIGHER SECONDARY STUDENTS IN TERMS OF THEIR NATURE OF SCHOOL.**

Type of School	N	Mean	SD	Calculated 't' Value	Level of Significance
Govt.	166	98.692	13.532	2.1264	Significant at 5% level
Govt. Aided	19	91.026	15.033		
Govt.	166	98.692	13.532	2.6062	Significant at 5% level
Self-Finance	65	94.961	7.844		
Govt. Aided	19	91.026	15.033	1.0981	Not Significant
Self-Finance	65	94.961	7.844		

Table-4 reveals that the obtained't' value of government and government-aided school higher secondary students are greater than the critical value 1.96 at 0.05 level of the significance. Hence it can be inferred that the government and government-aided school higher secondary students significantly differs in experiencing problem at the time of learning physics concepts. From this table, the obtained't' value of government and self-finance school higher secondary students are greater than the critical value 2.58 at 0.05 level of the significance. Hence it can be inferred that the government and government-aided school higher secondary students significantly differs in experiencing problem at the time of learning physics concepts.

From the above table, it also reveals that the obtained 't' value of government-aided and self-finance school higher secondary students are less than the critical value 1.96 at 0.05 level of the significance. Hence it can be inferred that the government-aided and Self-Finance school higher secondary students do not differ in experiencing problem at the time of learning physics concepts.

**Table – 5
DIFFERENCE BETWEEN THE MEAN SCORES OF PROBLEMS IN LEARNING PHYSICS OF HIGHER SECONDARY STUDENTS**

Class	N	Mean	SD	Calculated 't' Value	Level of Significance
XI Standard	96	98.20	14.395	0.8169	Not significant
XII Standard	154	96.474	14.66		

Table-5 reveals that the obtained't' value of the higher secondary stu-

dents are less than the critical value 1.96 at 0.05 level of the significance. So, there is no significant difference between mean scores of standard XI and standard XII students in experiencing problem at the time of learning physics concepts. Hence it can be inferred that the students of standard XI and standard XII are in experiencing problems in learning physics concepts are found to be equal.

FINDINGS OF THE STUDY

1. The problems faced by higher secondary students in learning physics concepts in classroom environment are 80.95%.
2. The higher secondary students significantly differ in experiencing problems at the time of learning physics concepts in terms of their gender. So the problems faced by girls are higher than the problem faced by the boys in learning physics concepts.
3. The higher secondary students are does not differ in their experiencing problems at the time of learning physics concepts in terms of their locality and studying class. Rural and urban students face problems in learning physics concepts are found to be equal and also the students of standard XI and standard XII are in experiencing problems in learning physics concepts are found to be equal.
4. The higher secondary students significantly differ in experiencing problems at the time of learning physics concepts in terms of their nature of school. The problem faced by govt. school students are at higher level than the govt. aided school students and private school students in learning physics concepts.

EDUCATIONAL IMPLICATIONS AND SUGGESTIONS

- The physics teacher should to develop interests, study habits, attention, and positive attitude towards physics among the students to learning physics.
- Teacher should develop good rapport with students and makes the democratic style class room environment in teaching physics. So psychologically, it will improve the learning ability of the students.
- Gives the adequate practice to develop problem solving ability and mathematics based application for more complicated and abstract concept in physics among the learners.
- P.G. Teachers of physics have to inculcate in the minds of the learners by simplifying of the concepts of physics by designing simple models, flow charts and 3-D pictures of the various apparatus used.
- The teachers have to creative interest among the students with simple tools in measuring in data used in problems. When teach the physics, the teacher associate and connects with the real world natural phenomena.
- In-service training is necessary to teachers for update their cognition and follow the innovative teaching method to make easy to learning physics.

CONCLUSION

The present investigation revealed that the higher secondary students are facing high level of difficulties in learning physics concepts which in turn gives a very low level of achievement. All these problems are both the teacher oriented and student oriented are taken in to consideration. Difficulties should be reduced among physics students as right and possible manners. Further, in classroom activities teacher should show much concern on individual learner and they have to understand the real problems of learners, will be more useful to reduce the problems and increase the effectiveness of the learners.

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