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# EFFECTIVENESS OF PROBLEM SOLUTION, DEMONSTRATION AND PERIODIC EVALUATION IN PHYSIC STEACHING

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There is a common feeling about the subject of Physics that it requires comparatively hard and continuous effort to have a thorough grasp of the subject. Physics being more mathematical than anyother science subject, can be best understood through problem-solving-approach and demonstration of the phenomenon. The present study has shown that the majority has appreciated, and responded to, discussing solution of problems, laboratory demonstrations and the holding of the periodic tests for evaluation as effective tools in the assimilation of knowledge of Physics.

## INTRODUCTION

It is often argued these days that the academic standards are poor and steadily deteriorating throughout the country at all levels of education. This deterioration has to be checked, and it seems necessary to bring about radical changes in our teaching process, techniques and in our approaches to handle new situations.

Teaching of a subject effectively requires constant revision and orientation to meet the needs of ever-expanding knowledge and development of the subject matter. There is the necessity of periodic evaluation of the student's achievement to inculcate in him the habit of regular studies. The present work was aimed at making a study of the effectiveness of problem-solution in Physics Theory and Practical Classes alongwith their periodic evaluation.

## MATERIALS AND METHODS

The students of University of Agriculture, Faisalabad, were taken as a universe. The sample was drawn only from F.Sc. 2nd year class because they were easily approachable. Instead of drawing a random sample cent percent population was administered the interview schedule.

Data on the opinion of the respondents regarding the effectiveness of

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problem solution, demonstration and periodic evaluation of Physics teaching have been discussed below:

## RESULTS AND DISCUSSION

Table 1. *Response of students to the various Processes of Learning.*

| Response | Frequency | Percentage |
|---|---|---|
| Giving detailed solution of the Problem | 81 | 36.65 |
| Discussing the Problem with the students | 54 | 24.44 |
| Giving outline of solution and then letting the students complete by themselves | 80 | 36.20 |
| Undecided | 6 | 2.71 |
| Total | 221 | 100.00 |

The opinions of the students regarding the problem-solving approach in Physics were divided in such a way that the class appeared to be composed of three groups of different mental levels.

In a heterogeneous class, a group of such students needed thorough coaching in the form of detailed solutions. That is why about 37 per cent of the students demanded complete solutions of the problems. The second group, about 24 per cent of the total, consisted of mediocre students as is clear from their desire for discussing the problems in detail. And the third group, about 36 per cent of the sample, contained the above average students, as they favoured the idea of solving problems themselves after getting an outline or some hints about the solution.

Only three per cent of the students showed indifference towards the need of teacher direction for solving problems in Physics theory, while about 97 per cent of the respondents indicated the need of some kind of guidance by the teacher. This result is supported by Frandsen (1961) who observed,

> "In most learning tasks and for the majority of pupils, some kind and amount of teacher guidance facilitate efficient learning. The necessity for teacher guidance, however, appears to vary with the complexity and novelty of the concepts or skills to be learned and with the resourcefulness and self-teaching talents of individuals..... Some children reveal, in their confused approaches to problems, the need for more explicit teacher guidance".

Table 2. *Response to the method of giving instruction in a Physics practical class.*

| Response | Frequency | Percentage |
|---|---|---|
| Complete demonstration of the experiment | 210 | 95.02 |
| Incomplete demonstration of the experiment | 8 | 3.62 |
| Verbal explanation only | 1 | 0.45 |
| Undecided | 2 | 0.91 |
| Total | 221 | 100.00 |

To understand a new experiment, which is to be performed by the students as a requirement of their practical class, the effective way is to see the experiment being demonstrated. Table 2 shows that the method of giving instructions for Physics practical class through a complete demonstration of the experiment has been appreciated most, i.e., about 95 per cent of the students have responded to this approach. Allgood (1965) discussing the merits of 'Lecture-Demonstration' method, stated,

> "The lecture-demonstration is a means of presenting material, visually and audibly, to a group of students. The average student is much more impressed by "Seeing" than by "Hearing", but if these two are interestingly combined, the presentation makes a more lasting impression, and creates a desire. The creation of desire resulting in action along some line is the ultimate goal of any lecture-demonstration".

Table 3. *Frequency of Class-Tests.*

| Response | Frequency | Percentage |
|---|---|---|
| After Covering a Topic | 43 | 19.46 |
| Weekly | 33 | 14.93 |
| Monthly | 123 | 55.66 |
| Quarterly | 8 | 3.62 |
| Bi-annually | 2 | 0.91 |
| Others | 6 | 2.71 |
| Undecided | 6 | 2.71 |
| Total | 221 | 100.00 |

Table 3 reveals that students do like to have tests after regular intervals of time so that they know their achievements to plan their work further. A small minority of about 5% of the respondents favoured quarterly and bi-annual tests, while about 57 per cent favoured monthly tests. Those favouring more frequent tests are also not a large number (33.39 per cent). To spend one period exclusively for class test every month appears to be feasible. On the one hand it helps to evaluate the achievements after regular intervals and, on the other, it is neither too often nor too seldom.

In the light of the above analysis a large majority of respondents have favoured the idea that problem solution, demonstration and periodic evaluation facilitates teaching in Physics.

## LITERATURE CITED

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