

**TEACHING PRACTICES OF PHYSICS SUBJECT
TEACHERS AT HIGHER SECONDARY LEVEL IN
SINDH PAKISTAN
(AN ANALYTICAL STUDY)**

Muhammad Dilshad*

Ahmad Saeed**

ABSTRACT

The aims of teaching of science at the college level is to develop scientific attitude ,enhance the scientific and technological competence, encourage creativity and solve the problems confronted by the students in their day to day life both within and outside the college premises. Therefore the science teacher needs to know about the variety of learning approaches and use technology while teaching. The overall purpose of the study would be to analyses teaching practices of physics subject teachers at higher secondary level in sindh. The study specifically analyzed the knowledge, skills, and behavior of the teachers and relation to subject command and their implementation. The mix research techniques were adopted. The questionnaire, interviews, observation were the major instruments. Data was collected through the personal visit and was analyzed by using inferential statistical technique along with the content analyses of the data. Concrete recommendations were made on the basis of finding.

Key words: Teacher Competencies, Teaching Practices, Intermediate level

* Research Scholar, Hamdard Institute of Education and Social Sciences, Hamdard University, Karachi, Pakistan

** Research Supervisor, Hamdard Institute of Education and Social Sciences, Hamdard University, Karachi, Pakistan

Introduction:

Teaching is the art of leading students to discover something which they already possess. In the other words, teaching is a dynamic and well-planned process. National education policy (1998-2010) the quality of education is directly related to the quality of instruction in the classrooms. Teacher is considered the most crucial factor in implementing all educational reforms at the grass root level. It is a fact that the academic qualifications, knowledge of subject matter, competency and skills of teaching and the commitment of teacher have effective impact on teaching learning.

According to the national professional standards for teachers in Pakistan (2009) the teachers understand instructional planning, design long term plans based upon knowledge of subject matter, students, community, curriculum goals and employ a variety of developmentally appropriate strategies in order to promote critical thinking problem solving and performance skills of all learners. Quality assurance requires professional standards of teacher education and an effective mechanism of accreditation of teacher education institutions and programs the policy and planning wing of the ministry of education professional standards for teachers have been developed. The standards of professional knowledge, skills and dispositions are designed to define competencies skills and attributes deemed to be essential for teachers guide .

Standard-I: Teachers know the center concept structure of the national curriculum. They design their context for the student. They give the learning experience that makes the subject matter easy and meaningful for the students.

Standard-II: Teachers know about the instructional knowledge which is based upon subject matter, student community and curricular goals, they promote their critical thinking problem solving.

Standard-III; Teachers spread the knowledge with verbal, nonverbal and communicate process. And these techniques work to foster. These processes collaborate and support with student and parents. Teachers use the information from the curriculum and certain amount of learning outcome results.

Standard-IV: Teachers know the science of teaching. English as record language and effectively communicate in English language. (STEP project Executed by UNESCO, 2009)

Literature review:

Grossman, G.M., Onkol, P.E. & Sands, M. (2006) defined that the content of physics develops not only the scientific attitude and scientific temper but also certain positive attitudes such as open mindedness, unbiased thinking, power of reasoning. Physics content is highly activity oriented subject and these activities taken up by the students in learning physics help a lot to satisfy the basic human desire of knowledge about the wonders of nature. It helps develop a creative thinking in them.

According to John, P. D. (2006) lesson plan is in actual sense a plan of action. It includes the working philosophy of the teacher, his knowledge of philosophy, his information about his understanding of his pupil, realization of the objectives of education, his knowledge of the material to be taught and his ability to utilize effective method." Thus a lesson plan is the way, according to which the teacher intends to keep his students busy during a particular period. It should look more like a programmed than a story. It should have headings and subheadings, of information to be provided the instruments and material to be utilized, the activities to be undertaken and the amount of knowledge and information to be imparted and learnt. It should explain the class for which the lesson is meant, the previous knowledge upon which it is based, the 'content and extent of the lesson as well as the various devices to be employed during the course of teaching the lesson. According to the Borich (2010) there are the different methods which play a vital role in teaching planning. Lecture method is the most commonly used method of teaching the physical science. This method is most commonly followed in colleges and in schools in big classes. This method is not quite suitable to realize the real aim of teaching science. In lecture method only the teacher talks and students are passive and listeners, since the students do not actively participate in this method of teaching so this method is a teacher controlled and information centered and teacher works as a sole resource in class room instruction. In this method the teacher performs experiment before the class and simultaneously explains what he is doing. He also asks relevant questions from the class and students and students are compelled to observe carefully because they have to describe each and every step of the experiment accurately and draw inferences. After the cross-questioning the inferences drawn by the students are discussed in the class. The student are active participants in this process of teaching lecture demonstration method is used by good science education in classroom. In heuristic method, the student be put in the place of an independent discover, thus no help or guidance is provided by the teacher. In this method the teacher set a undertaking. It is

just a problem. The situation has not only to be resolved but the activity involved is actually carried to completion the idea underlying the method is that children should develop their knowledge through trying out theories in the practical solution of problems in the course of which they would come to appreciate the principles involved.

The discovery method is a combination of laboratory method and heuristic method. In the discovery method, the student is often sent into the laboratory as a researcher to investigate a scientific problem in hand. The student collects the data, facts, observation etc, which becomes the basis for understanding the scientific principles support. In this method there must be a problem to solve. To be effective as a method of teaching the problem should be presented or posed by the students themselves. After selecting the problem the students should solve the problem by studying about it, experimenting and discussing it with the teachers and taking other help and guidance.

PURPOSE

Specifically the study addressed the following objectives:

1. To access the level of skills related to understand teaching methods the physics teachers at higher secondary level.
2. To identify the areas where teacher need further improvement with regard to understanding of teaching method.
3. To analyze the implementation of teaching methods during practice.
4. Analyze the effectiveness of teaching methods used during practices.

Methodology

The overall strategy of the present study was mixed approach. Researcher have used the survey research with cross-sectional research design. The population of the study consisted of all the Physics teachers ,science students and principals working in the government colleges of Sindh. . The population was large and heterogeneous. It was not possible to carry out a census. Consequently, a stratified random sampling design was adopted. The principals of classification related to the control, sex and district-wise location of the colleges were followed. Total sample size was 210 Physics teachers, 75 principals and 165 science students drawn from 258 colleges in Sindh. A tailor-made questionnaire comprised of sixty items was developed. Observation checklist was developed keeping in view the standards of effective physics teachers. The semi

structured interview schedule was used for collecting qualitative through in depth interview from physics teachers contained eighteen items. Two types of analytical techniques were used first, qualitative analysis of the interview protocols and observation are made. The results were described in narrative form. The second type of techniques was used quantitative which involved both descriptive and inferential statistical procedures. Tables with the frequencies and percentages were used for description of data. In testing the hypotheses involving groups, the t-test was used in item wise analysis, which involved categorical data the chi-square was used .the triangulation technique was adopted to analyze the data from various standpoints, to place the findings in right perspective.

Data analysis :

Testing of Major Hypotheses:

Null Hypothesis

There will be no significant difference in the views of younger and older college principals regarding the teaching competences and teaching practices used by the physics teachers at higher secondary level in sindh.

Conclusion

Referring to the table 't' we found that the tabulated value of 't' = 1.96 with $df = 73$ at $\alpha = 0.05$ is grater than the computed value of $t = 0.37$. Therefore the null hypothesis is accepted and it is concluded that there is no significant difference between in the views of younger (less than 55 years) and older (greater than 55 years) in Sindh.

From the inspection of the table it is clear that younger and older college principles show no different of view regarding the teacher competences and teaching practices used by the physics teachers at higher secondary level in sindh.

Item-By-Item Analysis of Data:

Item: I use different teaching (lecture, lecture demonstration, problem solving) method according to the content/ context.

Application of χ^2 for testing the significance of item

		S.F	M.F	U.F	Total
Step 1	fo	33	60	117	210
Step 2	fe	70	70	70	210

Conclusion:

Referring the table of χ^2 we found that the tabulated value of $\chi^2 = 5.99$ with $df = 2$ at $\alpha = 0.05$ is smaller than the calculated value of $\chi^2 = 52.52$. Hence H_0 is rejected and it is concluded that there is significance difference in views regarding the different teaching methods.

From the inspection of the table it is clear that most of the college teacher believe that the teachers don't use different teaching (lecture, lecture demonstration, problem solving) method according to the content/ context.

Content Analysis of Interview Protocols:

Question No: Which method do you use while delivering the lecture?

Table

Scale	Lecture	Lecture demonstration	Total
Frequency	15	05	20
Percentage	75	25	100

The above table shows that 75% of teachers use the lecture method. It is concluded that majority of respondents prefer the lecture method while teaching.

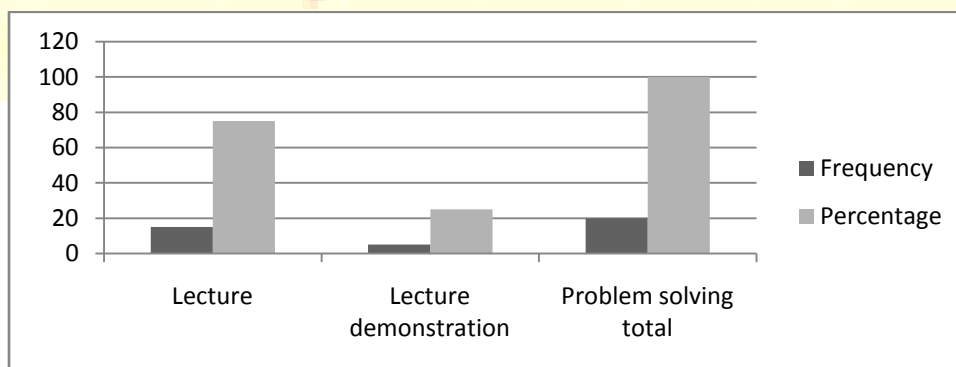


Fig 4.4.6 : Which method do you use while delivering the lecture?

Analysis of Classroom Observation:

Table: used method according to the content.

Scale	Frequently	Sometime	Never	Total
Frequency	1	3	6	10
Percentage	10	30	60	100

The above table shows that 60% of physics teachers were never using method according to the content, their teaching was conventional. The answer of teachers in questionnaire and interview showed same result because majority of teacher were untrained.

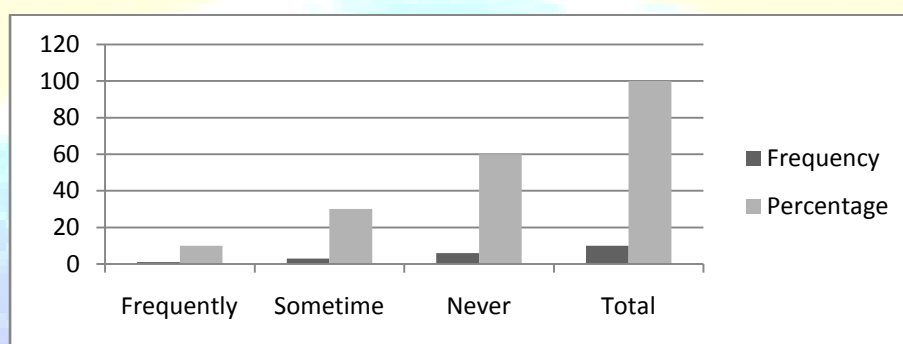


Fig 4.5.1 Used method according to the content

RECOMMENDATIONS :

- The academically expert and, professionally competent physics teachers may be appointed in the educational institutions.
- In-Service teachers training may be arranged according to the future needs.
- Seminars (related to teaching) may be arranged time to time.
- Research projects may be assigned to students according to their mental approach. latest software regarding the science education and internet facilities be provided in the college.
- Internal evaluation system may be introduced.
- Evaluation of the teaching process may be introduced and reward and punishment system may be implemented.
- Teacher may join in service training or practical base short course may be arranged time by time.

CONCLUSION :

Present era is known as the age of science and technology so physics is considered an important subject at intermediate level. The physics teachers have major responsibilities in achieving vital objectives in ongoing lessons. But teachers don't have the professional knowledge about the teaching. Therefore the overall objectives are not being achieved the physics teachers need to use diverse learning approaches in teaching which guide optimal progress. There are a variety of kinds of learning opportunities available for teachers to use in teaching and learning situation. Teachers should use educational technology in lecture for cleaning the concepts of students. The scientific behavior is the secondary objectives of physics subjects, which help the students to generalize the content information in real world. Pupils learn in diverse way and have unique intelligences as well as different style of learning. Science teachers need to study each pupil and assist him to learn as optimally as possible. It is vital to stimulate and maintain learner interest in science.

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