

An Analysis of the Factors Affecting the Performance of Science Teachers at Secondary Level in District Mardan (Pakistan)

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Abstract

The study was conducted to investigate those factors which affect the performance of science teachers at secondary level. Objectives of the study were to find out those factors which affect the performance of science teachers and the findings of the study will be good for improving the performance of science teachers. All the 123 principals/Head Masters and 1277 science teachers of high and higher secondary schools for boys of District Mardan were constituted population of the study. The study used simple random sampling technique for data collection and 60 principals/Head Masters and 120 Science teachers were selected as sample of the study. Closed ended questionnaires were used for collection of data. Two questionnaires were developed for principals/Head Masters, and science teachers of high and higher secondary schools. The questionnaires were distributed among 60 principals/Head Masters and 120 science teachers. Descriptive and inferential statistical techniques like percentage and chi square were used for data analysis. SPSS V-20 was used for data analysis. The study found that qualification, experience and their motivation had effects on their performance.

Key Words: Factors, Performance, Science Teachers, Qualification, Experience

Introduction

Every human activity starts with education and students are integral part of the process of education. Human beings have many basic rights and education is one of them. According to Mugenda and Mugenda (1999) education is the key for enlighten and source of wealth and power. The term education means to design instruction to give knowledge to students and young people and bring a desirable change in society. In similar context, Farooq (1994) said traditionally transmitting culture, preserving past and present and development of human society were the goals of education. The dominant factor in teaching and learning process is teacher and he plays the role of teaching in the activity. Teacher's role is also important in

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shaping the behaviors of the learners. Without any doubt teachers are builders of the nations. Teachers build the character of young generation and shape the society. The whole world admits the importance of teachers and their role in teaching learning process. According to Adeyemi (2010), teacher's role is integral for the academic achievement of students. Many countries of the world give high status to the teachers. Teachers in Japan are paid more than teachers in America. In developing countries, the profession of teaching is symbol of respect but the salaries are not as high as in developed countries and the working conditions are poor. If you want the teachers build your nation properly then you must give them educational guidance, counseling and motivation. Some researchers proved that qualification and experience of teachers had an influence on students' academic achievements. Similarly, Yala and Wanjohi (2011) and Andeyemi (2010) found that teachers' experience and educational qualifications were the prime predictors of students' academic achievements.

Qualified teachers can ensure promising students. Supporting this scenario, Maijer, et al., (1999) also say that "those teachers who are well qualified are always good at handling different situations. They are good just because they implement their knowledge or what they have in their minds". Iqbal (1996) defined the art of teaching as "teaching as arrangement and the manipulation of a certain situation in which a learner strives to overcome the problem related to learning". Similarly, Torrington (2003) said as "teaching comprises a series of actions intended to facilitate the learning process as teaching is a multi-dimensional set of activities". Therefore, competency in subject and professional training of teacher is must for effective teaching learning process (Smith et al, 2003). However, universally it has been recognized that professional training of teachers played a vital role in the academic achievement of overall learning of students (Panda, 2003). Many researchers agreed that the school factors including professionally trained teachers, experiences and motivation are influencing student's achievements in their studies. There are other contributing factors like aptitude, attitude and subject command, teaching methodology, subject contents and teaching technique which influence students' achievements.

The teaching process needs a lot of explanations due to its complex nature. Teaching and its nature is explained by many educationists in their own way. The human mind and all its mechanism are abstract. Psychology and educational Psychology are helpful in understanding the complex nature of human. Similarly, art is also very complex in the views of many educationists. Elwood (1990) observed about the nature of teaching is a "Science as well as art but what is science in teaching and what the art has never been delineated nor it is

of much concern to the teachers confronted to a group that is not similar with respect to physical growth, age, emotional and intellectual maturity, family background, understanding and even creed and cost". Teaching is science for some educationist and arts for other while some educationist considers science and art both. Arther (1990) said "Teaching is an employed science derived from human learning and behavior. Applied science utilizes Psychology, Neurology, Sociology and another apology". The educationist who considers teaching as an art, they said it is a complex activity and it needs with various aspects of human minds. This becomes a base for all other studies and environment. The Pakistani education system is trying hard but it is unable to achieve the target goals for the last 30 years. Therefore, education system is unable to create unity in the people of Pakistan. This is burning issue for policy makers to solve.

According to Akram (2001) creating good environment for teaching learning process is the duty of teachers. The environment will be beneficial if it is prepared by trained teachers. Therefore, professionally trained teachers are integral for teaching learning process. The role of suitable environment cannot be ignored in teaching learning process. The world made great progress and all fields of life are revolutionized because of science. Our life is affected greatly and life without science is difficult today. In today's world science have many fields and every field has many more branches. Every branch is sub-divided in many smaller branches. The teachers in secondary school teach many different things in the subject of physics, Chemistry and biology. Human life is changing very rapidly because of science. Every walk of life is under the impacts of science completely. Walker (2014) said that "Many of us have become very dependent on technology as it plays a very important role in our daily lives". The rapid development of science changed the nature and pattern of our daily life. Science has an everlasting effect on human life. A comfortable sleep is not possible without science in our life. It will be no exaggeration that modern life without science is like a body without soul. The teachers are still teaching science in the traditional and unscientific methods in their classes. This problem can be solved by providing energetic, dynamic and effective teaching staff to the system.

Science is derived from a Latin word, Scientia which means to organize, to know and administrate. Science deals with facts and figures which are provable, meaningful and understandable without doubts. Staver (2007) wrote an article on Science and Technology. In his article he defined science as way of knowing and learning about the nature of method. Rashid and Wahid (1998) defined Science as "A Series of theories based on experiments,

Observation which provide a foundation for new observation and experiment.” Similarly, Qureshi (2002) has own definition of science “Knowledge based on systematic experiment and research may be referred as Science”. According to Iqbal (2009) science is defined as collection of facts, a fixed and organized body of knowledge and absolute truth”. Science teacher would teach scientific knowledge and concept to their students. According to the modern standard of science teaching students are thought about modern scientific research, new concept, invention and discoveries by their science teachers.

In Pakistan Science is taught in curriculum from grade 1 onwards. In primary schools science is taught but the detailed study of science subjects starts from class 9. Students are given in-depth knowledge of scientific concept at this level. The theories of science are not fixed but changed and modified with the passage of time. The knowledge of science can only be taught through effective teaching. Detailed knowledge of subject and proper training makes good teachers. Up-to-date knowledge is must for students and only through these students can play their role effectively for the development and progress for their country. There are many methods of teaching science in the modern world but unfortunately in Pakistan traditional and lecture methods are followed by most of teachers. Changes are made in the curriculum every year but parent teachers are not involved in it. There is a huge gap between the officials concerned and the parents and teachers. The officials have no knowledge of the ground realities of education. Therefore, the policies always have gaps and it does not achieve the desired and expected goals and objectives. This makes the teaching and learning activities meaningless in school. According to Salam (1990) we are in the process of organizing and managing science teaching at all levels since 1947. The government plans and policies are not meeting the aims and objectives. In Pakistan policies are made but unfortunately it did not meet out ideologically based nor did it fulfill the modern needs of the country. All the governments tried to eradicate the problems and drawbacks of the education system in Pakistan. The focus of the reform was to reform the science teaching and science teacher in the country. Steps like increasing the number of science teachers, improving the status of laboratories, establishing new laboratories, qualified and professionally trained teachers are inducted to the department. The above mentioned reforms are good and effective but some more immediate steps are needed for the development of science teachers. Making a well-equipped laboratory, focus on practical work and reforming science curriculum according to the modern needs. All the factors brought changes in science. Science teaching in the world in general and in Pakistan in particular revolutionary

changes is needed to produce scholars who are aware of the modern developments in Science. Those scholars will fulfill the needs of their students. According to Alfred (1994) new goals for science teaching are being identified to produce scientifically literate citizens who understand one another and who know how to use this knowledge in decision making. The teachers in Pakistan must realize this quick change and the modern challenges otherwise they will remain far behind of the modern standards. John (2001) said the “teacher can also do less work or the same amount of work with something that really gets them going”.

Objectives of the Study

The objectives of the study were:

1. To examine the factors affecting the performance of science teachers at Secondary level.
2. To identify the academic, professional and administrative factors which affect the performance of science teachers?
3. To examine the various problems faced by the science teachers in secondary schools.

Statement of the Problem

The aim of the study was to investigate the different factors affecting the performance of science teachers. It makes a road map toward targets achievements and provides timely feedback to the students.

Significance of the Study

The study will be significant for all stakeholders in education including learners’ teachers’ educational authorities and policy makers along with this it will also reveal the existing effect of various factors affecting science teachers’ performance. It will fill the existing gaps of teaching learning activity. The outcome of the study would provide guideline to policy makers to consider the impact of that factor on learner’s learning outcomes. Moreover, it will indicate new issues for future research in this field.

Method and Procedure

The study was descriptive and quantitative in nature; therefore, survey design was applied in order to see responses of participants.

Research Design

Research design is one of the basic and important elements of research on which the entire concept of the system depends, so that the required task can be performed (Martinez, Basford, De Jager & Hart, 2012). There are different types of research methodologies which can be used in the context of relevant research study. However, it was descriptive study. The research methodology and procedure used in this study was to investigate the research problem. The main purpose of the study was to examine the factors affecting the performance of science teachers at secondary level. For this purpose, data were collected through two point's questionnaire.

Delimitation of the Study

This study was delimited only to male public elementary and secondary schools of district Mardan.

Population and Sample

The population of the study comprised of all 123 Government High and Higher Secondary Schools Principals/ Head Masters and 1277 (SST Sc) teachers of district Mardan. Random sampling technique was used to select the sample. According to the annual Statistical Report of Government Schools, there are 123 principals/Head Masters and 1277 male working science teachers (SST Phy & math) at secondary levels in district Mardan (EMIS, 2016). The sample consisted of 60 Principals/ Head Masters and 120 male science teachers from sixty Government Schools of District Mardan so that two science teachers from each school were selected.

Table1

S.No.	Respondent Group	Population	Sample size	G. Total
1	Principals/H.M	123	60	60
2	Science Teachers	1277	120	120
3	Total	14 00	180	180

Data Collection Instrument

A questionnaire was used for collection of data. Questionnaire comprised of 12 items which was used for getting information about Principals/ Head Masters and male science teachers.

Validity and Reliability

The questionnaire was pilot tested on small sample in those schools which were not included in the sample in order to find validity and reliability and improve questionnaire items. Consequently, some items were found weak and were deleted. Some items were rephrased to

science teachers' were agreed with the statement that science teacher's performance is affected by their teaching experience, (18%) science teachers were not agreed. The chi-square value at significance level 0.05 for principals is (9.6) and for science teachers is (48.12), which is greater in both the cases from table value (3.841). So the result shows that science teachers' performance is affected by their teaching experience.

Table 4: Science Teachers' Performance is affected by in-service training

S. No	Respondent	Yes	%	No	%	N	χ^2
1	Principals	38	63.3%	22	36.6%	60	4,26
2	Sc/Teachers	102	85%	18	15%	120	58.8

Level of significance =0.05df = 1

Table value = 3.841

The above table shows that majority (63.3%) of the principals were agreed that science teacher's performance is affected by science teachers in-service training and (36.6%) principals did not agree with the statement. On the other hand, majority (85%) of the science teachers' were agreed with the statement that science teacher's performance is affected by their in-service training, (15%) science teachers were not agreed. The chi-square value at significance level 0.05 for principals is (4.26) and for science teachers is (58.8), which is greater in both the cases from table value (3.841). Thus the result shows that science teachers' performance is affected by science teachers 'in-service training.

Table 5: Science Teachers' Performance is affected by science Laboratory.

S. No	Respondent	Yes	%	No	%	N	χ^2
1	Principals	40	66.6%	20	33.3%	60	6.66
2	Sc/Teachers	90	75%	30	25%	120	30

Level of significance =0.05df = 1

Table value = 3.841

The above table shows that, majority (66.6%) of the principals were agreed that science teacher's performance is affected by science Laboratory and (36.3%) principals did not agree with the statement. On the other hand, majority (75%) of the science teachers' were agreed with the statement that science teacher's performance is affected by science Laboratory, (15%) science teachers were not agreed. The chi-square value at significance level (0.05) for principals is (66.6) and for science teachers is (30), which is greater in both the cases from table value (3.841). So the result shows that science teachers' performance is affected by science Laboratory.

and student to make them aware of the deficiencies during the learning process. Yala and Wanjohi (2011) and Andeyemi (2010) found that teachers' educational qualifications and experience were the prime predictors of students' academic achievements. Supporting this scenario Majjer et. al., (1999) also say that "those teachers who are well qualified are always good at handling different situations. They are good just because they implement their knowledge or what they have in their minds". Majority of the respondents both Principals/Head Masters and science teachers were of the view that science teachers were highly qualified and affecting their performance positively. The same idea is supported that "Science Teachers' Performance is affected by their qualification". Majority of the respondents expressed that high teaching experience of science teachers' affect their performance and developing their students' results positively. The results are significant and supporting the views that "Science Teachers' Performance is affected by their teaching experience". The present study revealed that for improving the efficiency and upgrading their performance in order to evaluate students' performance, most of the science teachers have received in-service training. The result of the study is consistent with the view that Science Teachers' Performance is affected by in-service training. A lot of the respondents were of the view that their schools have proper science laboratories with full facilities fulfilling students' needs for doing practical work. The same idea is supported that "Science teachers' performance is affected by science Laboratory, Laboratory facilities, and by doing practical work.

Conclusions

- i. The study found that majority of science teachers were highly qualified and having a lot of teaching experience. Science teachers were highly qualified who can easily motivate their students for learning.
- ii. Seventy-five percent of the Principals/Head Masters and 80% of science teachers expressed that most of the science teachers were qualified and used their qualification for students' development in class. The same idea is supported by the respondents that science teachers' performance is affected by their qualification.
- iii. Majority of the respondents were of the view that science teachers have proper expertise in teaching methods and using it for the student's development in order to fulfill students' needs.
- iv. The same idea is supported by most of the respondents that "science teachers' performance is affected by teaching experience.

- v. The present study revealed that in-service training is conducted for science teachers in order to train and keep them aware of the use of new and modern teaching methods.
- vi. Seventy-five percent of the Principals/Head Masters and 67% of science teachers were of the view that schools should have proper science laboratories with full facilities for fulfilling students' needs.
- vii. The same idea is supported by most of the respondents that "science teachers' performance is affected by science laboratory and laboratory facilities.
- viii. The present study showed that 73% of the Principals/Head Masters and 70% of Science teachers do practical work in laboratory for evaluation and improving the performance and efficiency of students. The same idea is supported by most of the respondents that Science Teachers' Performance is affected by doing practical work.

Recommendations

The following recommendations were drawn on the basis of conclusions:

- i. The concept of qualification and experience among science teachers should be carried out in secondary schools in order to improve our educational system. Therefore, it is recommended that government should require appointing highly qualified science teachers for motivation and learning of students.
- ii. A comparative study should be carried out between public and private secondary school teachers in order to compare their qualification, experience and motivation. Therefore, it is recommended that government should require to plan and organize such programs.

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