PROBLEMS OF SCIENCE TEACHING AT HIGHER SECONDARY SCHOOLS IN SAHIWAL DIVISION

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40-SS/PHD (EDU)/05

DEPARTMENT OF EDUCATION

FACULTY OF SOCIAL SCIENCES

INTERNATIONAL ISLAMIC UNIVERSITY

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A Master level thesis submitted as a pre-requisite of PhD Education programme

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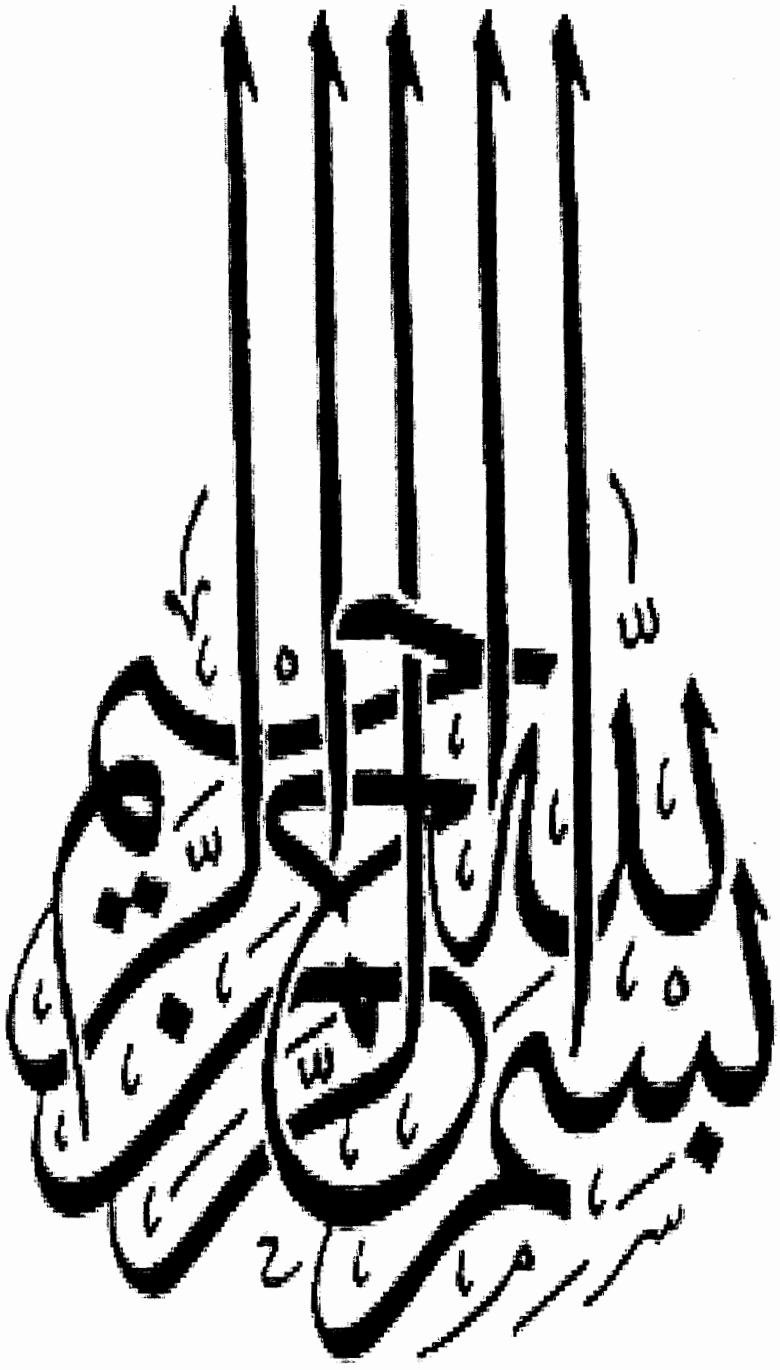
بسم الله الرحمن الرحيم

Dedicated

to

All those Forces

Which Helped in

Uplifting the

Humanity

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ABSTRACT

The study was aimed to pinpoint the problems of science teaching at higher secondary schools in Sahiwal Division.

The objectives of the study were to study the factors influencing the teaching of science, to identify the problems of science teachers and science students, to explore the personal, professional and academic background of science teachers, to collect the information about present facilities and requirements at higher secondary level and to suggest some remedial measures for the improvement of science teaching at the higher secondary level.

This study was expected to be useful for the teachers, students, educational administration and curricular developers in creating awareness about the drawbacks in teaching methods, requirements of the students and difficulties faced by the teachers in science teaching, importance of experimental work and the use of A. V. Aids in teaching.

For conducting the study, all science teachers working in the male and female higher secondary schools of Sahiwal Division and all boys and girls science students were included.

The main findings of the study were that majority of science teachers were feeling deprived of residential, medical and other facilities; the laboratories were deficient of equipments and apparatus; relevant A. V. aids and libraries had insufficient science books. Teachers encouraged students to undergo private tuition. A large number of teachers and students were not satisfied with the syllabus of science textbooks. Teachers were not satisfied with the present assessment system. It was important to note that in Sahiwal Division the number of teachers in H.S.S was higher than the number of students.

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CHAPTER - 1

1.1 INTRODUCTION

Education plays an important role in building and moulding the character of an individual. It determines the status of nation among the community of nations. Education helps a person to understand himself and his environment in which he is living.

In dark ages, power ruled over the world but in the present age, science ruled over the world. Science is free of time, space and nation. We are passing through the age of science. The present progress in the world owes to science. It has brought revolution in our daily life. Education is in fact protest against the problems of our daily life. We can say that the education is a national building activity and it will be play an increasingly important role in our future development.

The rapid progress in the field of agriculture, technology and industry in developed countries depends upon the advancement in science, because it gives accurate facts. We need the highest standard of science. In the existing system of Pakistan, science education neither meets the requirements and nor fulfils the demands and basic needs of students and teachers. It requires overall changes. It is only possible if we find out drawbacks, shortcomings, and major problems in science education.

Higher secondary schools are newly born. Lack of well-trained staff, laboratory equipments and library books are the major hurdles in higher secondary schools. Science teaching is facing many problems, and difficulties of varying nature. For example, the increasing rate of population, pollution in air, water etc. our government should, therefore, make every effort to fulfill the needs of science teachers so that they could do their work satisfactory. It is very difficult to change the whole set-up of science education at once, but we can moderate this system stepwise.

After receiving the literature, it was found that prior to the study under reference; very little work was done different universities, government colleges of education, in view of the importance of the study, discussed with his guide who allowed him to undertake this project.

1.2 STATEMENT OF THE PROBLEM

Science has enormous influence on our lives. It provides the base line of modern technology-tools, materials, techniques, and source of power that makes our lives and work easier. The discoveries of science also help to shape our views about ourselves and our place in the universe. But unfortunately so many problems present in our education system with respect to science education. Pakistan and Pakistani are facing many problems especially in the fields of science and technology. Science and technology can be promoted if it is supported at its fundamental stage. This stage begins at intermediate stage in which a student has to choose a field of Science and Arts and has to face so many difficulties and hardships. So the present study was also an effort to delve into the problems of science teaching at higher secondary schools in Sahiwal division.

1.3 OBJECTIVES OF THE STUDY

The objectives of the study were to;

1. Study the factors influencing the teaching of science.

2. Identify the problems of science teachers and science students.

3. Explore the personal, professional and academic aspects of science teachers.

4. Collect the information about present facilities and requirements at higher secondary level.

5. Suggest some remedial measures for the improvement of science teaching at the higher secondary level.

1.4 SIGNIFICANCE OF THE STUDY

This study will be useful for the teachers, students, educational administration and curricular developers.

Science teacher will come to know about the drawbacks in their teaching methods and try to improve their teaching. They will come to know the requirements of the students and difficulties faced by the teachers in science teaching. They will come to know the importance of experimental work and the use of A. V. Aids in their teaching.

This study will also beneficial for the educational administration, as after identification of problems in science teaching, they will try to improve the existing situation.

This study will also helpful for the curricular developers, as they will try to incorporate the needs or requirements of students and the teachers in making the curriculum.

No such study was undertaken in Sahiwal district. This study will further provide guideline for research. Well-equipped laboratories, good libraries and other required facilities motivate the teachers and students to draw their attention and encourage them to work sincerely. It will give the aid to curricular planners and administrators for making effective policies to tackle these problems.

1.5 POPULATION

All Science Teachers (Subject Specialists of Mathematics, Chemistry, Physics and Biology) males and females working in the Government Higher Secondary Schools and all science students (males and females) which are studying science subjects (Mathematics, Chemistry, Physics and Biology) in these institutions of Sahiwal Division.

1.6 SAMPLE

For conducting the study, all science teachers working in the male and female Higher Secondary Schools of Sahiwal Division and all male and female science students (classes XI, XII) studying in these Higher Secondary Schools were included in the sample.

1.7 DELIMITATIONS

The study was delimited only to the higher secondary schools working in the public sector. Schools working in the private sector were not included in the study.

1.8 PROCEDURE

There were three districts in Sahiwal division i.e. Okara, Pakpatan and Sahiwal. There were thirty-five higher secondary schools in Sahiwal division. All were running under the administrative control of the Punjab Government. Related literature was studied. In the light of the review of the related literature, researcher prepared two questionnaires (one for teachers and the other for students). Questionnaires were tried out on four subjects. After finalization of the questionnaire, it was administrated on teachers and students. Collected informations were interpreted in terms of percentage.

CHAPTER-2

REVIEW OF THE RELATED LITERATURE

2.1 WHAT IS SCIENCE

The word science has its origin from a Latin word, "Scientia" meaning "to know". Vaday (1992) states that, "Science is a heap of truth".

Science is the systematic study of nature and how it affects our environment and us. It is an organized body of knowledge and systemic process of investigation and interpretation. This definition of science is not just restricted to a body of knowledge but it is also concerned with finding out about the world in a systematic way (scientific method) and retrieval of information and appropriate sources (Shami,2001).

According to Rehman (2004), science may be defined as "Any of various intellectual activities concerned with the physical world and its phenomena and entailing observation and systematic experimentation. He also states that "A wide variety of discipline or intellectual activities which has certain features in common"

According to William and Emanuel (1992) "Science is not only an intellectual and practical activity; it is also a social one. The social, intellectual aspects of science are interlocking and help to characterize the enterprise of science". (p.498)

From all the above definitions, it is concluded that science is a systematic process which involves general truths, it has a cumulative nature and covers the natural facts of the world.

2.2 WHAT IS TEACHING

"Teaching is a way of imparting knowledge or skill from generation to generation".

According to Peters and Burnet (1983) "Teaching is concerned with doing something for an individual who will result in something done to the individual. Teaching in school is formal action to bring about a greater opportunity for the student's becoming educated. Teaching is a society's way of insuring that the young will be alerted to the cultural heritage as a base for continuing and improving the culture". (p.7)

Arend (1998) viewed that "teaching offers a bright and rewarding career foe those who can meet the intellectual and social challenges of the job. Despite the recent spate of reports critical of schools and teachers, most citizens continue to support our schools and express their faith in education. The task of teaching the young is simply too important and complex to be handled entirely by parents or through the informal structure of early areas".

Vienna (1988) has discussed the role of teachers and students to make teaching effective as under. (Pp.281-82)

2.2.1 ROLE OF TEACHERS TO MAKE TEACHING EFFECTIVE

Teachers must look into their functionalities in view of improving the performance of the system. They can perform in the following ways:

I. Making their knowledge up to-date in the context of reading/ teaching material approaches methods, and systems.
II. Making aware of latest developments and advances in science and technologies and local problems and educating students accordingly.
III. Making use of powerful communication media such as TV and other demonstrative activities and translating advance knowledge in simpler form for creating knowledge and creating thinking.
IV. Maintaining is teaching approach and materials more and more interesting for students.
V. Paying adequate attention on socio-economically poor students by all extra means.
VI. Stopping writing and printing guides, doing tuitions, and unnecessary pressing for "own benefits".
VII. Participating and organizing seminars, workshops, conferences etc, for improving reading and teaching approaches and methods and overall educational environments.

2.2.2 ROLE OF STUDENTS TO MAKE TEACHING EFFECTIVE

Students are the main and direct beneficiaries of the whole educational system. Therefore, they will have to play greater and intensive role. They have to it more functional and productive. It can be done through;

I. Forming an association of students, parents, management, government officials and other local people and participating in identifying and sorting out their own problems.
II. Maintaining their regular habit of reading and attendance in class.
III. Participating and making use of libraries, laboratories, and workshops.
IV. Maintaining educational environments in proper direction or in order.
V. Developing professional approach and objective system to the education for their better education planning.
VI. Stopping politically motivated union activities, for saving the education system from power, policies and its polluted affects.

2.3 ROLE OF SCIENCE EDUCATION IN THE WORLD

Science has played a vital role in solving the problems of all aver the world, the developed countries made much progress in the field of science by making the new educational policies which emphasis on science.

Hough (1994) stated that; "educational policies at secondary level has overlong period of time been dominated by the question of reorganization on comprehensive lines. Especially in France, Sweden, UK and West Germany but also to some extent in

Australia, secondary schooling in the USA. has traditionally been on comprehensive lines at least as regards the public or state schools and when Japanese education was reorganized after the Second World War, it was deliberately modeled on American pattern". (p. 295)

Zaki (1978) describes that "The development of any country depends upon its population. If the creative leaders are present in population, a major percentage of those leaders must be engineers and technologists in order to provide the sparks needed to develop the country's infrastructure and production". (p. 69)

Hayes (1987) viewed that "Education is the most vital investment for any programme of socio-economic development. Its neglect can cost generation. No educated society has ever achieved the heights of economic has political power. No educated society has ever been left behind in the relentless march of history. (p. 72)

2.4 OBJECTIVES OF SCIENCE TEACHING

Science teaching enables the individual to solve their problems and it makes the individual good-citizen for the society. The objectives of the science teaching are in fact the goals of any nation. According to the Government of Punjab Ministry of Education the objectives of Science teaching are:

1. Inculcation of scientific aptitude in the nation as a whole.
2. Scientific understanding of the environments we live in, attaining the capability to interpret nature and surroundings and planning to develop in our collective self

the industrial development depends upon technology that is the result of scientific knowledge, thus all progress grows out of men's creative capacities. (P. 2)

Vaidya with reference to Pauli states that the aim of science teaching is not the acquisition of information and a view skill but to attain the understanding of the relationship which connects the answer of the problem. (p. 61)

According to Rafi (1974) the objectives of science teaching are as follows:

I. To inculcate among the students the scientific spirit and develop scientific out-looks among the students.
II. To provide such knowledge in science as may be applicable to every day problems of the modern life and be useful for the students in dealing with them. (p. 101)

Rehman (2004) has introduced the following objectives of science teaching:

1. Inculcation of scientific aptitude in the nation as a whole.
2. Scientific understanding of the environments we live in, attaining the capability interpret nature and surroundings and planning to develop in our collective self the skills to built up our scientific institutions according to our conditions and requirements
3. Production of skilled manpower in the form of laboratory technicians, assistants and attendants to handle our technical problems such as repair of instruments and to work for research supervisors in the laboratories.
4. Production of first-rate teachers and competent scientists, doctors and engineers.

5. Production of efficient and careful planners for central monitoring and efficient managers form the control of industrial, technical and commercial establishment.

2.5 TEACHING METHODS USED FOR SCIENCE TEACHING

There were variations in the styles of teaching with respect to questioning, use of board, presentation and explanation of the involvement of students in instructional activities and dictation of notes in the form of answers to the examination questions. It was found that the academic achievement of the student in science subjects is very low. The variation in the style of teaching adopted by the science teachers was found to influence the main achievement sources. The nature of the questions asked by the teachers and level of participation by students also appeared to influence the achievement. The teacher characteristics such as questioning, training, experience and command over the subject were also found to influence the student achievement. It was found the objectives of teaching science and the method of science at higher secondary level as stated by science teacher did not correspond with those found in the literature of science education. This indicated that teachers did not possess the required level of understanding of the objectives and methods of teaching science.

Various modes of teaching for learning as reported by Ahmad (2004) that can be used in structures class situations include the following;

1. Lecture and Verbal Presentation Method.
2. Discussion-Questioning Method.
3. Practice and Drill Method

4. Viewing, Listening, Answering Method.
5. Heuristic, Problem-Solving and Discovery Method.
6. Laboratory and Inquiry Method.
7. Role Playing, Simulation and Games Method.

2.6 DIFFICULTIES IN SCIENCE TEACHING

Rafi (1984) pointed out the difficulties in science teaching as under: (pp. 101-102)

- **Inadequate Preparation Of Science Teacher**

  Teacher is the pivot in the education system and the teachers of science subjects do not possess the requisite qualification. Since graduates are in short supply in the country, which is fast, becoming industrialized, they are very much in demand and are readily absorbed in industry and commerce where they get lucrative job.

- **Lack Of Facilities For Science Teaching**

  Laboratory work is an integral part of science teaching, but their facilities are not available in a number of schools, especially in rural areas. There are neither the rooms nor the apparatus with the result that the teacher has to resort to demonstration, which is a poor substitute for individual practical work.

- **Absence of Devices to Supplement Class-Room Teaching**

  In addition to chalk and talk there are other devices to supplement the classroom teaching. These, to mention only a few, are field trips, radio transmitted science

lessons, film on scientific topics and mobile museum. The beginning has been a mode but these devices are still beyond the research of most of the secondary schools.

- **There is also Reluctance**

  On the part of schools to introduce scientific hobbies and spare time activities. Then again in science exhibitions and science fairs are not a regular feature though they are very popular if they are organized.

According to Aquila (1990) science education in Pakistan suffers from

- Paucity of funds.
- High student teacher ratio.
- Unrealistic load
- Outdated curricula.
- Ill equipped laboratories.
- Lack of qualified teachers and conservative system of examinations. (p.13)

2.7 REQUIREMENTS OF SCIENCE TEACHING

Students can learn much more in a little time, if they are interested in their work and proper facilities are available to them. New UNESCO Source Book for science teaching (1998) recommended the following facilities for science teaching. (pp. 14-15)

I. Making a Science Corner in the Class-Room

Set aside a corner in the classroom and call it the science corner. If possible, obtain one or two tables, which may be, used foe experimenting and display. Materials should never be allowed to remain on the table so long that their interest value is lost. The science corner should be a place of activity and change.

II. A Science Bulletin Board

If children are encouraged, they will constantly bring to school interesting items they have clipped from newspapers or magazine. The science bulletin board provides a place to display such material. The bulletin board can be made from softwood or from pressed fiberboard.

III. A Museum Shelf

Once children become interested, they are insatiable collectors. Providing museum shelf, where collections or science items may be displayed, should encourage them.

IV. Aquaria And Terraria

Aquaria and terraria are the source of constant interest and provide a place where many important science phenomena may be observed.

V. Cages for Animals

Several types of animals can be kept in the class-room for observation. Some animals adjust to be caged better than others.

VI. Setting Up a Weather Station

Observing the weather changes from day to day is source of interest and can form the basis for useful science lessons.

VII. Growing Plants

Small flowers pots placed along a windowsill where there is plenty of light will provide ample space for growing seeds and small plants.

VIII. Tropical Conditions

In the tropics there are many causes of trouble in a laboratory, especially during a wet season. Material perishes, papers stick together, instruments rust, and lenses develop a fungus. During the rainy season, microscopes, galvanometers and other sensitive instruments should, if possible, be stored in an airtight cupboard in which a 50-watt electric bulb is kept burning continuously.

On the other hand contribution of science teachers is also important. He should be expert in his profession. According to Qaddus (2000) the particular functions of teacher are:

- Teaching (lectures, Lab. demonstration, tutorial).
- Research.

- Personal study, including preparation for class teaching, and
- Contact with students, including personal guidance and supervision of extra-curricular activities. (pp.199-200)

2.8 IMPORTANCE OF LIBRARY FACILITIES

Haye (1997) pointed out that good and well- stocked school and college libraries are the need of the time. They are an effective means of supplementing the otherwise limited, narrow smattering knowledge imparted in most of our institutions under the present examination ridden- system of education. Libraries are an index to a Nation's culture and civilization. The larger number of libraries in a country the more enlightened the people supposed to be, for the cultured alone among the peoples can realize the importance of good books as torches which go to remove the darkness of ignorance. They help pass time and add to the interests of life. They also help stimulate independent thinking and encourage the spirit of research. Good libraries are not mere stores of books on various sciences, humanities and languages. They are properly organized and run by librarians who are usually persons of vast learning and rich experience in their occupation. They classify, catalogue and arrange books on different branches of human knowledge and provide necessary facilities to the seeker of knowledge.

Good librarians are a great blessing to the general readers for they can offer necessary direction and guidance in their studies, the scholars and researches may find in them ready references to the much wanted, but not easily accessible works of real value. (pp. 102-103)

2.9 IMPORTANCE OF LABORATORIES

Science laboratories provide supplementary aid for science teaching. It contributes in the development of skills, habits and attitude.

Vaidya (1996) says that after independence, it was cheaper for us, theoretically speaking, to provide and equip effectively since laboratory for the schools. This is no large true when we switch over the higher secondary system which necessitated upgrading of science content, providing for additional, valid and advanced type of laboratory work and paying more for chemical, equipments, coupled with this was the problem of increasing number of student aspiring for science education. (P. 217)

2.9.1 IMPORTANCE OF PRACTICAL WORK

Experimentation is a necessary event for teaching and learning in science. Russell and Harlen (1990) emphasis on practical work and says that it is not possible to distinguish practical activity from mental activity and so we are concerned with for more than the physical manipulation of objectives and the ability to use equipment effectively. (p. xii)

Foster and Lock (1997) has written about the importance of practical work as under: (pp.47-48)

i. Practical work is also important in that it can help pupils to learn and develop a range of skills.

ii. A role of practical work is that of encouraging inquiry based learning.

iii. Another role of practical work with relevance outside school science is that of illustrating an approach to problem solving which is generally referred to as the scientific method.

iv. Practical work can also lead to the festering and development of attitudes.

v. Practical work can give experience of the accurate approach demanded in some areas of scientific and technical employment.

2.10 IMPORTANCE OF A.V. AIDS

Richardson (1989) expressed his views about the A.V. Aids. He is of opinion that one can not have first hand experience through reading although there is an opportunity for various experiences in this way. Some basic first hand experiences, use of and reading activities are essential. A.V. Aids make learning permanent. It moulds the attitude towards science. (p. 385)

Dale Edgar (1999) emphasized on audio-visual material in teaching. He stated that, "A revolutionary change will occur in the schools, when audio-visual material are closely coordinated and integrated with other Media's of communication". (p. 29).

2.11 SETUP OF HIGHER SECONDARY LEVEL

The educational system of Pakistan may be divided into five major levels. The pre-university education consists of four levels.

1. Primary Level (Grades I to V)
2. Middle Level (Grades VI to VIII) also called Elementary Education.
3. High Level (Grades 9 and 10) Known as Secondary Education.

4. Intermediate Level (Grades 11 and 12) also recognized as Higher Secondary Education.

The Pakistani education system is highly centralized. The Ministry of Education is in charge of coordinating all institutions involved in academic and technical education up to the intermediate level. The education system at Higher Secondary Level consists of the 12 years education followed by primary level, middle, secondary and higher secondary levels.

Secondary education system in Pakistan is comprised of two stages. First stage is called secondary stage which includes 9^{th} and 10^{th} classes. The 2^{nd} stage is called higher secondary stage which includes 11^{th} and 12^{th} classes. 9^{th} and 10^{th} classes are taught in secondary schools whereas 11^{th} and 12^{th} classes are taught in Higher Secondary Schools, Intermediate Colleges and Degree Colleges.

Table: 2.1

Level/Stage	**Class**	**Duration**	**Age on entry**
Elementary			
Primary	I-V	5 years	5 years
Middle	VI-VIII	3 years	10 years
Secondary			
Secondary	IX-X	2 years	13 years
Higher Secondary	XI-XII	2 years	15 years
Higher			
Graduate	XIII-XIV	2 years	17 years
Postgraduate	XV-XVI	2 years	19 years

2.12 REVIEW OF RELATED RESEARCH STUDIES

Amjad and Munir (1999) conducted a study to find out the problems of science teacher in Lahore city schools. For this purpose a questionnaire was prepared and administrated to all the seventy five science teachers of Lahore city schools. Some major findings of the study were given as under.

i. 68.3 % science teachers felt pressure of higher authorities to recommend helping.

ii. 58.3% of science teachers were satisfied with the internal assessment system.

iii. 68.3% of school laboratories were well equipped.

iv. 45% of science teachers found the school library helpful in science teaching.

v. 68.3 % teachers felt that the class size was much.

vi. 75% of teachers arranged practicals.

On the basis of findings researches give the following conclusions;

I. Majority of the science teachers were satisfied that their posts are according to their qualification.

II. Teachers faced problems due to the large sized classes.

III. School politics creates problems for teachers.

IV. Library facilities are not suited to teaching of science.

V. Majority of science teachers had excessive work load in terms of teaching assignments.

VI. Science teachers do not have separate office rooms and so feel difficulty to study and guide their students.

VII. Community interference is a source of difficulty for teachers.

Another research conducted by Irshad and Furqan (1998) in Multan District under the topic "A Study of the Difficulties faced by the Science Teachers in Multan District". This study was delimited to thirty high schools. Questionnaire was given to science teachers for the collection of informations. The investigators personally visited the schools and get the questionnaire filled by the science teachers from each school. The data collected was analyzed in terms of percentage. The investigators made the following findings.

I. Only 13 % science teachers attended refresher-courses.

II. 10 % of science teachers were teaching other subjects in addition to science teaching.

III. 66 % of the school had no arrangement for conducting science practical.

IV. No high school has modern A.V. Aids like film projector and T. V.

V. 100 % of the high schools were provided with black boards etc.

The findings of the study are led to the following conclusions. The major points are the following:

a. Room capacity of laboratory in many schools was insufficient as compared to students in the class.

b. Some schools were without laboratories and laboratory attendants.

c. Majority of schools were without library facilities.

d. Modern A.V.Aids like film projector, tape recorders, slide projectors and TV are not available in majority of schools.

e. Most of the science teachers had to perform extra duties and those extra duties interfered in their teaching.

f. In many schools the science classes are over crowded.

g. Many teachers have to face difficulties in striking of the broken and consumed articles by the competent authorities.

h. The government has provided no residential facilities to the science teachers.

Bukhari (1999) made a study of the science teaching facilities in District Attock on a topic "A Study of The Science Teaching Facilities in District Attock". The researcher developed a questionnaire, which included ten questions. All the Girls Higher Secondary Schools of Attock District were the population of the study. All the data was collected personally. It was arranged and analyzed in percentage. On the basis of this percentage, he drew of the following findings. Some major findings and conclusions given by the research are listed as under: -

- Most of the female higher schools are located in the rural areas and except two schools; all of them are under in government sector.
- The average number of teachers per school in the whole district is about which clearly indicates the deficiency the teachers at higher level in girls schools of Attock District.
- The average number of science teachers per school in the whole districts less than one, which shows serious deficiency of science teachers.
- In female higher school 92 % teachers never attended any refresher course. It explains the fact that the in-service training of science teacher needs proper rationalization.
- The majority of the students have the trend to study the arts subjects.

- 10 % of higher schools have sufficient books on science, 60 % have insufficient and 30 % have no books on science.
- 47 % of science teachers mentioned that they face difficulty in completing the science course in time.
- Only 7 % of the science teachers had got the residential facilities.

Bhatti (2001) conducted, "A Study of the Factors That Affect the Teaching of Science at Secondary Level". A questionnaire have thirty-four question was designed to search out the factors. A sample of thirty schools was composed of fifteen schools from rural area and fifteen from urban area. The informations relating to aspects such as: lack of facilities for science teaching and professional growth of science teacher was collected. Researcher has given a number of findings are given below:

- Out of thirty teachers, 93.3 % of the science teachers were properly qualified and trained.
- 87 % of science teachers were not satisfied with time-table allotment, while 13 % of the science teachers are satisfied with the period allotted.
- Out of whole, the 73.3 % of the school had not well equipped science laboratories.
- 93.3 % of the schools had no separate science libraries.
- 70 % of the school science teachers were in the opinion that the private tuition affects the teaching work while the 30 % of the teachers were opposite to this opinion.
- 93.3 % of the schools were deprived of the science books in their science libraries.

- All the science teachers were not satisfied with the teaching of science at the primary and middle levels.
- 93.3 % of the schools had no scientific association.

Investigator, on the basis of findings, made the following conclusions:-

- Most of the schools particularly schools in rural areas have single science teacher.
- Most of the science teachers have to teach all the science subjects (Physics, Biology, Chemistry, and Mathematics) which are very laborious work.
- Most of the science teachers due to having more periods than their capacity are unable to make ad3equate preparations for teaching science.
- Most of the schools have a single laboratory for all science subjects.
- Most of the school libraries are completely deficient of science books.
- Most of the science teachers are not satisfied with the present syllabus and curriculum.
- One half of the teachers are in opinion that private tuition affects the science teaching.
- Options of students for science subjects are almost wrongly directed due to having no admission criteria.
- One half of the schools have class system or group system to perform practical.

Another research was conducted by Mehmood and Babar (1998) to find out the facilities available to science teachers for the teaching of science subjects to class 11^{th} and 12^{th} in the higher schools of the city and cant. A questionnaire having thirty items was given to

fifty science teachers. They collected informations about the suitability of text books, library, laboratory and use of A. V. Aids. Major findings of the study were as under:-

I. 92 % of the science teachers of the Lahore city were properly qualified.

II. Majority of science teachers, 67 % is of the opinion that Chemistry, Physics, and Biology text books for classes 11^{th} and 12^{th} are suitable to some extent.

III. 80 % of the science teachers do not have any separate laboratory for Chemistry, Physics and Biology Practicals.

IV. 87 % of the science teachers do not have any separate office or room for them.

V. 98 % of the teachers are in the opinion that they don't have any science club or association.

VI. Majority of science teachers replied that A.V. Aids expect chalk and black board are not available.

On the basis of findings, the researcher drew the following conclusions:-

i. Majority of the science teachers was not provided with well-furnished science laboratories for the students.

ii. They have also indicated that they were facing lack facilities regarding science equipment and chemicals.

iii. Some science teachers indicated that they had not been provided proper laboratory attendant.

iv. Some science teachers indicated that science classes were over-crowded.

v. Majority of the science teachers was in favour in establishment of science club and societies.

vi. Majority of the science teachers indicated that science funds were insufficient for the purchase of science material.

vii. Majority of the science teachers mentioned that A. V. Aids, expect blackboard, chalk were not available in their schools.

Tahir (2000) conducted a research, which was designed to investigate the problems of science teaching faced and perceived by higher secondary school students. The researcher used survey method for conducting this research. The questionnaire was consisted of items to general informations. Ten male government higher secondary schools were selected as population and from each, ten students were selected randomly. Major findings were that: -

I. About half of the science students replied those physical facilities such as water supply; heat arrangement and electricity are available in their schools.

II. Majority of the science students expressed that no proper practical demonstration arrangements are being made in the laboratories of the schools.

III. They further agreed that the teachers deliver proper instructions before the practical from the guide, test papers and do not properly plan them.

IV. One fourth of the science students expressed that their teachers use A. V. Aids.

V. Half of the science students could easily understand the lesson taught by the teacher in the classroom.

VI. Half of the students expressed that they are given corporal punishment on asking various questions about the lesson in the class.

VII. Majority of the science students expressed that their teachers teach the courses according to the textbook and emphasized on selected study.

The findings of the study led to the following conclusions: -

a. Because of the inadequate professional and academic background of the science teachers in Boys Higher Secondary Schools Sialkot City, the result of the science students might be affected.

b. In majority of the schools science classes are over-crowded. Individual attention becomes impossible. Checking of some work and arrangement for the practical work is a problem faced by the science students.

c. It is included that there is a heavy workload on the majority of the science teachers of Sialkot city which affects the teaching of science subjects.

d. Most of the science teachers in the Boys Higher Schools of Sialkot city are required to perform practicals in groups of forty students and they are not permitted to perform individually.

e. In most of the schools of Sialkot City, laboratories are present but sufficient space is not available for performing practical work, which creates problems for science teachers and science students and ultimately affects the practical work of the science subjects.

f. In most of the schools, the lab. Is not well equipped which also affect the performance of science practicals.

g. Most of the science teachers in the boys higher schools of Sialkot city use ready made models, diagrams, charts etc. but they do not use home made A. V. Aids.

h. Medium of instruction and system of examination affect teaching of science subjects in the Boys Higher School of Sialkot city.

CHAPTER – 3

METHODOLOGY

This chapter describes the methodological details of constructing and distribution of questionnaire, collection and analysis of data.

3.1 DESIGN OF THE SDUDY

In order to collect the informations "Survey Method" was adopted. For this purpose, two questionnaires were prepared (one for the teachers and other for the students). Questionnaires were about educational, personal, library, laboratory, syllabus, A.V.Aids facilities and other problems related to science teaching.

3.2 POPULATION

Population of the study was consisted on:

1. 40 Subject specialists Science Teachers (Male) in Sahiwal division.
2. 42 Subject specialists Science Teachers (Female) in Sahiwal division.
3. 28 Science Students (Boys) studying in GHSS of Sahiwal division.
4. 34 Science Students (Girls) studying in GHSS of Sahiwal division.

3.3 SAMPLE

Being number of teachers and students were limited so hundred percent population was selected for sample. The breakup of samples was given as under:

S.#	Category	Population	Sample	Q. Sent	Q. Received	%age
1	S.S. Science Teachers (Male)	40	40	82	66	80.49
2	S.S. Science Teachers (Female)	42	42			
3	Science Students (Boys)	28	28	62	50	80.65
4	Science Students (Girls)	34	34			
Total		144	144	144	116	80.55

3.4 DEVELOPMENT OF THE QUESTIONNAIRES

Two questionnaires were framed out to cover all the relevant problems and factors, which influence science teaching. Questionnaires were prepared after a thoroughly study of literature on science teaching and research reports. Discussion with guide, science students, science teachers of higher secondary schools were also made before finalization of the questionnaires.

3.5 VALIDATION OF THE RESEARCH TOOLS

The prepared questionnaire for the teachers was tried out on four teachers. On the basis of tryout results were discussed with supervisor and the amendments were made accordingly. Four questions were dropped and ten questions were added. In the light of their opinion, questionnaire was modified and language of five questions was changed. The research instrument was completely assessed out before used, to have satisfactory results. In the beginning of the questionnaire direction for the respondents for filling the questionnaire were given.

Part II of the questionnaire for teachers was sub-divided into the following sub-topics:

A. Personal questions.
B. Questions about laboratory.
C. Questions about library.
D. Questions about science curriculum.
E. Questions about audio-visual aids.
F. Miscellaneous and problems / suggestions.

The respondents were required to answer in "YES/NO" form.

The questionnaire of the students was also sub-divided into the following sub-topics:

A. Educational problems.
B. Teachers' attitude.
C. Personal matters.
D. Laboratory facilities.
E. Library facilities
F. Syllabus.
G. Miscellaneous questions and problems /suggestions.

The respondents were required to answer in "YES/ NO" from and in MCQs encircling his/her interested options. They were fair typed and photocopied for administration.

3.6 COLLECTION OF DATA

There were 35 higher secondary schools in Sahiwal Division. All were running under the administrative control of Punjab Government. The researcher and his three research associates visited all higher secondary schools and opinionaires were made to be filled by the science subject specialists as well as from science students concerned with these institutions. Some teachers thought that the researcher was a government servant and conclusion of this study might be influenced their job by knowing all the drawbacks in science teaching. So the researcher and his three research associates spent many days to collect the questionnaire.

3.7 ANALYSIS OF DATA

After receiving the data, tabulation was made and responses were calculated in terms of percentage. On the basis of the main findings, the conclusions were drawn and recommendations were made and presented in Chapter five.

CHAPTER-4

ANALYSIS OF DATA

This chapter concerns with analysis and interpretation of data. The opinions of the teachers and the students are analyzed and percentages are calculated in the pages shown in the following. Opinions of the teachers are analyzed in the form of tables No. 4.1 to 4.8. Opinions of the students are analyzed in the form of tables from 4.9 to 4.15.

The academic and the professional qualifications of the teachers are shown in the table No.4.1.

Table 4.1 Academic and Professional Qualifications of Teachers

Sr. No	Qualification	No. of Teachers	Percentage
1	PhD.	0	00
2	MSc. MPhil.	4	06 %
3	MSc., MEd.	4	06 %
4	MSc. B.Ed.	44	66.7 %
5	MSc.	14	21.3 %

The above table shows that:

No teacher had Ph.D. degree, 6% had MSc. M. Phil. Degree. Teachers having the M.Sc., M.Ed. education are only 6%. Majority of the Subject specialists had passed MSc. B.Ed. courses, 21.3 % subject specialists were untrained although they passed MSc. degree.

Teaching experience of the teachers is shown in table No.4.2.

Table No.4.2 shows the teaching experience of the teachers

Sr. No	Experience	No. of Teachers	Percentage
1	Below 3 years	20	30.3 %
2	4-6 years	18	27.3 %
3	7-9- years	16	24.2 %
4	Above 10 years	12	18.1 %

The above table indicates that

30.3 % teachers had 3 years experience. 27.3 % had 4-6 years. 24.2 % teachers had teaching experience from7-9 years. 18.1 %teachers had above than 10 years teaching experience.

Teachers' responses about personal questions are shown in Table No.4.3.

Table 4.3: Teachers' responses about personal question

Sr. No	Statement	Yes	%age	No	%age
1	Your post is according to Your qualification.	60	90.9	6	9.1
2	You are satisfied to your present status.	32	48.5	34	51.5
3	The Govt. has provided residential facility.	8	12.1	58	87.9
4	Scholarship facilities for your family are available.	8	12.1	58	87.9
5	You have proper medical facilities.	10	15.1	56	84.9

The above table clears that

90.9 % teachers hold post according to their qualification. 51.5 % teachers were not satisfied with their present status. Unavailability of scholarships and medical facilities range from 87.9 to 84.9 %.

The responses about laboratory are shown in table No.4.4.

Table 4.4: Teachers' responses about laboratory facilities

Sr. No	Statement	Yes	%age	No	%age
1	Lab. Unit is available in your school.	36	54.5	30	45.5
2	Qualified Lab-Attendant is available.	10	15.1	56	84.9
3	You are allowed to work in the Lab. at any time.	42	63.6	24	36.4
4	Capacity of Lab. As compared to students is sufficient.	34	51.5	32	48.5
5	Govt. provides sufficient funds for purchase of science equipments.	12	18.1	54	81.9
6	Lab. Unit of your school is well equipped with apparatus.	16	24.2	50	75.8
7	Chemicals are available in the Lab.	22	30.3	44	66.6
8	Water and gas supply is available.	12	18.1	54	81.9

The above table shows that:

Majority of the teachers (63.6%) is satisfied to do work in the laboratory at any time. A large number of teachers (54.5%) say that in schools, laboratory unit is available. Only (30.3%) teachers responded that the chemicals are available in the laboratory. 51.5% teachers say that the capacity of laboratory as compared to the students is sufficient.

Ratio of %age obtained in yes on availability of equipments, provision of sufficient funds for the purchase of science equipments, water and gas supply, and availability of qualified laboratory attendant in laboratory ranges from 15.1 to 24.2.

Teachers' responses about library facilities are shown in Table No.4.5.

Table 4.5 Teachers' responses about library facilities

S. No	statement	Yes	%age	No	%age
1	Your school has library.	62	93.9	4	6.1
2	Principal/ Headmaster takes interest in improvement of library.	42	63.6	24	36.4
3	Library closes earlier.	42	63.6	24	36.4
4	Library facilities are satisfactory.	16	24.3	50	75.7
5	Books on science are in sufficient quantity.	6	9.1	60	90.9
6	Library opens in time.	40	60.7	26	39.3

The above table shows that:

Majority of teachers (93.9 %) confirmed the existing of library. Percentage of both the improvement of library and earlier closing of library was obtained as 63.6. 60.7 Percent teachers say that the library opens in time. 90.9 Percent teachers responded in negative on science books where as 24.3 % replied in favour of library facilities.

Teachers' responses about science curriculum are shown in Table No. 4.6.

Table No.4.6 Teachers' responses about science curriculum

S. No	Statement	Yes	%age	No	%age
1	Science curriculum fulfils the requirements of modern time.	26	39.3	40	60.6
2	Topics are introduced in detail.	30	45.4	36	54.5
3	Most of the content of science books has no concern with our daily life.	28	42.5	38	57.5
4	Curriculum promotes social value.	38	57.5	28	42.5
5	Curriculum does not include technical and vocational subjects.	34	51.5	32	48.5
6	Time allocation for theory work is suitable.	46	69.6	20	30.4
7	Time allocation for practical work is suitable.	46	69.6	20	30.4

According to the above table

69.6 % teachers responded that the time allocation for theory and practical is suitable. 51.5 to 57.5 % teachers expressed their views that curriculum does not include technical and vocational subjects and curriculum promotes social values. Ratio of %age obtained in

yes on curriculum requirements, content of science books and detail of topics range from 39.3 to 45.4.

Teachers' responses about A.V. Aids are shown in Table No.4.7.

Table 4.7 Teachers' responses about Audio-visual Aids

Sr. No	Statement	Yes	%age	No	%age
1	Models.	14	21.2	52	78.7
2	Charts.	40	60.7	26	39.3
3	Black board.	58	87.8	8	12.2
4	Coloured chalk.	32	48.5	34	51.5
5	Duster.	46	69.6	20	30.4
6	Tap recorder.	6	9.1	60	90.9
7	Television.	10	15.1	56	84.9
8	Slide projector.	10	15.1	56	84.9
9	Film projector	4	6.1	62	93.9
10	Over head projector	6	9.1	60	90.9

11	flat pictures	12	18.1	54	81.9
12	Maps.	32	48.5	34	51.5
13	Posters.	10	15.1	56	84.9
14	Cartoons.	6	9.1	60	90.9
15	Radio	2	3.1	64	96.9

The above table indicates that

The majority of the teachers (87.8 %) confirmed the presence of blackboard. 60.7%Teachers stated that the charts were available. 48.5 % Teachers replied that the Colored chalk and maps available. 21.2% Teachers verified the presence of models. 18.1%Teachers said that the flat pictures were available. 15.1 % Teachers indicated the availability lists of posters. Slide projector, cartoon, overhead projector and tape recorder.

Responses about miscellaneous are have shown in Table No.4.8.

Table No. 4.8 Teachers' responses about miscellaneous questions

S. No	Statement	Yes	%age	No	%age
1	Science teaching staff is available according to the student's strength.	42	63.6	24	63.3
2	Parents of your pupils coordinate with you.	30	45.5	36	54.5
3	You receive encouragement from administration.	38	57.5	28	42.5
4	You are satisfied with the present assessment system.	20	30.3	46	69.7
5	Staff room for teachers is available.	22	33.4	4	66.6
6	Tutorial systems function in your institution.	26	39.4	40	60.6

The above table shows that

The maximum (63.6%) were satisfied with the strength of the teaching staff, (57.5%) teachers expressed their views that they received encouragement from administration. (45.5%) teachers responded that the parents of the pupils co-operated with them. (39.4%) teachers said that tutorial functions were held in their institution. (66.6 %) teachers reported the staff rooms were not available. Maximum (69.7 %) teachers were not satisfied with the present assess system.

Students' responses about educational problems are shown in Table No.4.9. (a).

Table 4.9 (a) **Students' responses about educational problems**

S. No	Statement	Options	Numbers	%age
1	You read science	due to parents	14	28
		due to teachers	2	04
		due to your own will	34	68

The above table sows that

(68) % students read science due to their own will. (28)% Students replied that they read due to parents. (04)% Read due to teachers.

Question No. 2 of this sub-heading is shown in Table No.4.9 (b).

Table 4.9 (b) Educational Problems

S. No	Statement	Options	Numbers	%age
2	You take much interest in	Biology	14	28
		Mathematics	18	36
		Physics	6	12
		Chemistry	12	24

The above table indicates that:

(36%) Students took interest in mathematics. (28%) Students, in biology. While (24%) Students in chemistry and (12%) Students, in physics.

Question No.3 of above sub-heading is shown in table No.4.9 (c).

Table No. 4.9 (c) - Educational Problems

S. No	Statement	Options	No.	%age
3	Reason of difficulty of subject is.	material of books	16	32
		teaching method	22	44
		lack of interest	12	24

According to above table

(44%) students replied that the teaching method made subject difficult. (32%) students answered that the material of book was difficult. (32%) students said that lack of interest made subject difficult.

Question No.4 of this sub-headings shown in Table No. 4.9 (d).

Table 4.9 (d) Educational Problems

S. No	Statement	Options	Numbers	%age
4	You learn science lessons by	Writing	16	32
		Understanding	28	56
		Memorization	6	12

The above table indicates that:

(56%) students learned science by understanding. (32%) students learned science by writing. (12%) students learned science by memorization.

Question No. 5 of this sub-heading is shown in table No. 4.9 (e).

Table 4.9 (e) **Educational Problems**

S. No	Statement	Options	Numbers	%age
5	You do your science practicals.	Round the year.	32	64
		At the end of year.	12	24
		During the summer vacations.	6	12

The above table shows that:

64% Students did their science practicals round the year. (24) % students did their practicals at the end of the year. (12) % did their practicals during the summer vacations.

Question No. 6 of above sub-heading is shown in table No. 4.9 (f).

Table 4.9 (f) **Educational Problems**

S. No	Statement	Options	Numbers	%age
6	Practicals are performed by.	Every students	6	12
		Groups	34	68
		Teacher himself	10	20

This table shows that:

(68) % Students performed practicals in-groups. 20 % Students replied that teacher himself performed the practicals. (12) % was of the view that the every student performed the practicals.

Question No.7 of this sub-heading is shown in table No. 4.9 (g).

Table 4.9 (g) **Educational Problems**

Sr. No	Statement	Options	Numbers	%age
7	You want to read	Text Books.	8	12
		Notes.	18	36
		Both.	24	48

This table indicates:

(48) % students wanted to read textbooks. (36%) students preferred to read the notes. (12%) wanted to read the textbooks as well as notes.

Question No.8 of the sub-heading is shown in table No.4.9 (h).

Table 4.9 (h) **Educational Problems**

S. No	Statement	Options	Numbers	%age
8	You use unfair means in examination to	get through	14	28
		get further admission	16	32
		Secure good job.	20	40

Above table shows that:

32 % Used unfair mean to get further admission. 40 % Used unfair means in examination to secure good job. 28 % Students used unfair means in examination only to pass the examination.

Responses about teachers' attitude are shown in Table No4.10 (a).

Table No 4.10 (a) Students' Responses about Teachers' Attitude

S. No	Statement	Options	Numbers	%age
1	Your science teachers behave with you.	Strictly	10	20
		Softly	6	12
		Both ways	34	68

The above table indicates that:

68 % Teachers behaved with their students strictly as well as softly. 20 % Students replied that their teachers behave strictly. 12 % Teachers behaved with their pupils softly.

Question No.2 of this sub-heading is shown in table No.4.10 (b).

Table No4.10 (b) Teachers' Attitude

Sr. No	Statement	Options	Numbers	%age
2	Teaching satisfies you.	Yes.	6	12
		To some extent.	26	52
		Not at all.	18	36

The above table shows that:

52 % students were satisfied by teaching to some extent. 36 % teaching did not satisfy Students. 12 % teaching satisfied the students.

Question No.3 of the sub-heading is shown in table No. 4.10 (c).

Table 4.10 (c) **Teachers' Attitude**

Sr. No	Statement	Options	Numbers	%age
3	Your teacher compels you for tuition.	Yes	30	60
		No	16	32
		Against tuition	4	8

The above table indicates that

60% Teachers compelled for tuition. 32% Students said that their teachers did not exert pressure for tuition. 8% Students replied that their teachers were fully against the tuition.

Student's responses about personal matters are shown in Table No.4.11.

TableNo.4.11 Students' Opinions about Personal Matters

S. No	Statement	Yes	%age	No	%age
1	Your parents are educated.	40	80	10	20
2	Your parents are invited to inform the results.	22	44	28	56
3	You have proper time for reading.	40	80	10	20
4	You can meet the expenses incurred on science.	30	60	20	40
5	Medical facilities are provided to you.	14	28	36	72
6	You feel hesitation by asking any explanation from your teachers.	26	52	24	48

The above table indicates that:

80 % Students told that their parents were educated and they have proper time for reading. Many students 60% replied that they could meet the expenses incurred on science. Ratio of percentage obtained in yes on medical facilities, information parents and hesitation ranges from 28% to 52%.

Student's responses about laboratory facilities are shown in table No.4.12.

Table No.4.12 Students' Responses about Laboratory

S. No	Statement	Yes	%age	No	%age
1	Laboratory has modern facilities	10	20	40	80
2	Laboratory is well-equipped.	10	20	40	80
3	Demonstration table is available in the science laboratory.	18	36	32	64

According to the students responses

36% Students tell that demonstration table is available. 20 % Students reported that their laboratory has modern facilities. 20 % Students reply that their laboratory is well equipped.

Student's responses about library facilities are shown in table No.4.13

TableNo.4.13 Students' Response about Library Facilities

S.#	Statement	Yes	%age	No	%age
1	You are satisfied with science books in your library.	2	4	48	96
2	Debates are arranged on science topics.	4	8	46	92
3	Newspapers are supplied regularly.	24	48	26	52
4	Science tours are arranged for students.	4	8	46	92

This table shows that:

48 % Students were in favor that that newspaper was supplied regularly. 80 % Students replied that debates on science and science tours were arranged in their schools. Only 4 % students were satisfies with science books in library.

Students' opinions about syllabus are shown in Table No.4.14.

Table No.4.14 Students' Responses about Syllabus

S. No	Statement	Yes	%age	No	%age
1	Syllabus is long.	48	96	2	4
2	Syllabus is short.	2	4	48	96
3	Your teachers finish syllabus in time.	24	48	26	52
4	Syllabus is easy.	12	24	38	76
5	Syllabus is difficult.	38	76	12	24

According to the above table

96 % Students expressed their views that the syllabus was long. Where as 24 % students felt that the syllabus was easy.

Student's responses about miscellaneous questions are shown in table No.4.15.

TableNo.4.15 (a) Students' Responses about Miscellaneous Questions

S. No	Statement	options	Numbers	%age
1	You prepare for examinations	All chapters	4	8
		Some chapters	38	76
		Few selected topics	8	16

This table indicates that

8 % prepared full chapters. 76 % prepared few chapters for examination. 16 % Prepared selected topics.

Question No.2 of this sub-heading is shown in table No.4, 15 (b).

Table No.4.15 (b) Miscellaneous Questions

S.#	Statement	options	Number	%age
2	Your teachers used A. V. Aids.	Some times	10	20
		Often	16	32
		Never	24	48

According to:

48% Students, teachers never used A. V. Aids. 32 % Students were of the view that their teachers used A. V. Aids often. 20 % Students, their teachers used A. V. Aids sometimes.

Question No.3. Of this sub-heading is shown in Table No.4.15(c).

Table No.4.15 (c) Miscellaneous Questions

S. No	Statement	options	Number	%age
3	Admission policy is based on	Pure merit	30	60
		Interview	4	08
		Both	16	32

According to

60 % students' admission policy was based on pure merit. 08% Students replied that admission policy was base on interview. 32 % reported that that the admission policy was based on both.

Indications of Problems/Issues Not Included in Questionnaires

Students and the teachers were asked to indicate any problem/issue not included in the questionnaires. Here the problems/issues indicated by them along with few suggestions issued by them are summarized.

- Majority of the students and teachers suggested that libraries should be equipped with books on general knowledge, religious informations, science magazine, and latest discoveries in science. A large number of teachers and students suggested that librarians, news papers, furniture and funds should be provided in their libraries. Working hours of libraries should be increased as possible.
- Mostly teachers suggested that funds should be provided to higher secondary schools for the purchase of modern science equipments, chemicals, apparatus and electricity, water, gas supply. Laboratory attendants are not appointed in laboratories, so it is very necessary to appoint qualified laboratory attendants.
- The most teachers emphasized on the provision of modern and relevant A.V. Aids, which are not available in many institutions.

CHAPTER-5

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 SUMMARY

This study was designed to find out problems of science teaching in higher secondary schools of Sahiwal Division.

For this purpose, two questionnaires were prepared. One was administrated to all the subject specialists (Biology, Chemistry, Physics, Mathematics) working in male and female higher secondary schools. The other questionnaire was administrated to all the pre-medical and pre-engineering students for the collection of informations. 66 Questionnaires were received duly filled in by the science teachers out of 82 and only 50 questionnaires were returned duly filled in by the science students.

The informations were collected in all aspects such as professional and academic qualification of science teachers, educational and personal problems of students, and teachers' attitude towards students, curriculum difficulties, and use of A. V. Aids, library, laboratory and medical facilities. The major objectives of the study were to:-

1. To study the factors influencing the teaching of science.

2. To identify the problems of science teachers and science students.

3. To collect the information about present facilities and requirements at higher secondary level.

After collecting the relevant informations, the researcher was analyzed the data on the basis of tabulated informations.

5.2 FINDINGS

The significant findings of the study are given as under:

1. 21.3 % of subject specialists of science were untrained, 6 % is M. Phil., and 66.7 % is B. Ed. And only 6 % were M. Ed. (Table:4.1)
2. 30.3 % of subject specialists of science had less than three years teaching experience, 27.3 % has 4-6 years and 24.2 % teachers had 7-9 years experience. (Table No.4.2)
3. 90.9% was appointed according to their qualifications and 48.5 % teachers were satisfied with their present status. (Table 4.3)
4. According to 12.1 % teachers government had provided them scholarship and residential facilities. (Table 4.3)
5. According to 54.5 % of teachers laboratory units were existing in their schools and 84.9 % of teachers indicated that laboratory attendants were not provided in laboratories. (Table 4.4)
6. 80 % Students had the view that the laboratories were not well equipped with modern facilities. (Table 4.12)

7. 81.9 % Teachers had reported that the government had not provided sufficient funds to purchase science equipments and laboratories were without water and gas supply. (Table 4.4)
8. 51.5 % Teachers were satisfied with the laboratory's capacity. (Table 4.4)
9. According to 93.9 % teachers, their schools had libraries. (Table 4.5)
10. 96 % Students were not satisfied with the availability of books in their libraries. (Table 4.13)
11. 63.6 % Teachers had the opinion that principal took interest to improve the library. (Table 4.5)
12. According to 60.7 % teachers, library opened in time and according to 63.6 % teachers library closed earlier. (Table 4.5)
13. According to 92 % students debates were not arranged on science topics. (Table 4.13)
14. 52% Students were not satisfied with newspaper supply. (Table 4.13)
15. According to 60.7 % teachers, curriculum did not fulfill the requirements of modern era. (Table 4.6)
16. According to 92 % students, science tours were not arranged by their administration. (Table 4.13)
17. According to 96 % students syllabus was lengthy and couldn't be completed in due time. However, 48 % of teachers view that syllabus was completed in time. (Table 4.14)
18. According to 76 % students, syllabus was difficult.

19. 69.6 % Teachers had the opinion that time allocation for theory and practical work was suitable. (Table 4.14)
20. According to 42.5 % teachers, most of the content of science had no concern with our daily life and 57.5 % teachers were not satisfied with the content of science books. (Table 4.6)
21. According to 42.5 % teachers curriculum did not promote the social values. (Table 4.6)
22. According to 51.5 % teachers curriculum did not cover technical and vocational aspects. (Table 4.6)
23. Responses of teachers about availability of A.V.Aids such as radio, film projector, cartoon, over head projector, television, tape recorder, posters, slide projector, flat pictures and models came from 3.1 % to 21.2 %. (Table 4.7)
24. According to majority 48 % of students their teacher never used A. V. Aids, while some 20 % of students said that the sometime A. V. Aids were used by their teachers. (Table 4.15(b))
25. 54.4% Teachers reported that parents of their pupils didn't co-operate with them to understand the problems of students in learning. (Table 4.8)
26. According to 60.6 % teachers tutorial were not arranged in their schools. (Table 4.8)
27. 28 % Students read science due to their parents. While 68 % students preferred science subjects according to their own will. (Table 4.9 (a))

28. 44% Students felt their science subjects difficult due to uneffective teaching methods, whereas 76 % students said that the course contained difficult material. (Table 4.9 (c))

29. 24% Science students said that science practicals were arranged at the end of year, while 64 % students said that practical work was done throughout the year. (Table 4.9 (f))

30. According to 48% students, they liked to use notes instead of textbooks, while only 12 % students wanted to use textbooks. (Table 4.9 (g))

31. 40 % Students admitted that they used unfair mean to get good results to get good job, while 28 % students responded that they used unfair means to get through. (Table 4.9 (h))

32. According to 20 % students, their teachers behaved towards them strictly, whereas 68 % were of the view that sometimes teachers' behave was strictly and sometimes softly. (Table 4.10 (a))

33. Majority of the students 60 % described that their teachers compelled them for the tuition. (Table 4.10 (c))

34. 60% students stated that they could meet the expenses incurred on science. (Table 4.11)

35. According to 52 % students they hesitated asking any explanation from their teachers during teaching. (Table 4.11)

36. A large number of students 60 % expressed their view that the admission policy was based on pure merit (based on the marks obtained) whereas 32 % students

replied that admission policy was based on merit as well as on interview.

(Table 4.15 (c))

37. Majority of teachers 69.7 % were not satisfied with present assessment system.

(Table 4.8)

5.3 CONCLUSIONS

On the basis of finding, it was concluded that following were the problems faced by the students and teachers:

- Science teachers were feeling deprived of residential, medical and other facilities. (Finding#4)
- The laboratories were deficient of equipments and apparatus. (Finding#5-8).
- The schools were facing lack of relevant A. V. Aids such as film projector, over-head projector, posters, cartoons, tape recorder and radio set etc. (Finding#23-24)
- Libraries had insufficient science books and didn't play requite role in teaching learning process.(Finding#9-12)
- Co-Curricular activities were not arranged in many schools. (Finding # 13,16)
- Teachers were compelled majority of students for tuition.(Finding # 33)
- Teachers and students were not satisfied with the syllabus of science textbooks. (Finding # 20-22)
- Teachers were not satisfied with the present assessment system. (Finding # 37)
- In Sahiwal Division the number of teachers in higher secondary schools was higher than the number of students.

5.4 RECOMMENDATIONS

- Facilities such as medical, residential and allowances for the teachers of higher secondary schools in Sahiwal Division are not satisfactory. How they can face serious financial difficulties. It is necessary that measures may be taken to give financial and other facilities to them in order to raise their living standard.
- It is noted that there is a lack of relevant A.V. Aids. It is, therefore, recommended to the Ministry of Education to provide the A. V. Aids or funds for the provision of A. V. Aids.
- It is recommended to the concerned authorities to allocate the funds for the establishment of science laboratories as in many schools laboratories are not well equipped. It is also needed to appoint one qualified laboratory attendant in each school. Funds should be enhanced and should only be on the disposal of concerned science teacher without interference of higher authorities.
- In many schools the libraries are not well equipped. It is recommended to the higher authorities to provide recent scientific magazine, research journals, religious information, latest discoveries in science and books on general knowledge. The existence of small library in each laboratory will be beneficial for science students. A full-time librarian is also needed in every school. Necessary arrangements may be made in this regard.
- It is important to note that science teachers are more than science students in higher secondary schools. Basically, there are three factors involved:

a. Firstly the students prefer to go to city colleges rather than schools because colleges have better academic and social environment than the higher secondary schools.

b. Secondly the laboratories and libraries are not well equipped in higher secondary schools while the colleges have rather better facilities of such kinds. In this situation, it is suggested that the environment of the higher secondary schools shall be improved by providing good working conditions to both students and teachers. In addition, better laboratory and library facilities may attract more students.

c. Thirdly shortage of staff especially Science Subject Specialist.

- Teachers and students are not satisfied with the syllabus of the textbooks. Some teachers regard this syllabus, as it is not up-dated. It is suggested that the necessary changes should be made in curriculum in terms of subject matters. In addition, the subject matter should be relevant to the practical life. For the purpose of better comprehension the language of the textbooks should be a bit easier.
- Co-curricular activities play an important role in overall growth and development of the learners. It is recommended that the sufficient funds must be allocated to for these purposes.
- It is also recommended to the higher authorities that research facilities may be provided to each student and teacher. Funds for research should be granted in addition to other research facilities.

- If the higher authority can't provide these facilities then such institutions may be converted back to secondary schools so that the expenditure in the form of money and material may be saved.

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ANNEXURE – 1

List of Male Science Teachers

Sr. No	Name of Institutions	No. Of Teachers
1	Govt. Higher Secondary School, Iqbal Nagar (Sahiwal)	3
2	Govt. Higher Secondary School, Renala Khurd(Okara)	3
3	Govt. Higher Secondary School, Qaboola(Pakpattan)	2
4	Govt. Higher Sec. School Kassowal, Sahiwal. \	3
5	Govt. Higher Secondary School, Iqbal Nagar (Sahiwal)	2
6	Govt. Higher Secondary School,120/9-L KAMIR (Sahiwal)	2
7	Govt. Higher Secondary School, Harappa (Sahiwal)	3
8	Govt. Higher Secondary School, 73/5-L (Sahiwal)	3
9	Govt. Higher Secondary School, 58-A/G.D (Sahiwal)	3
10	Govt. Higher Secondary School, Noor Shah (Sahiwal)	2
11	Govt. Higher Secondary School, 56/5-L (Sahiwal)	2
12	Govt. Higher Secondary School, 58-A/G.D (Sahiwal)	2

13	Govt. H. Secondary School,96/12-L Chichawatni (Sahiwal)	3
14	Govt. Higher Secondary School,168/9-L (Sahiwal)	2
15	Govt. Higher Secondary School, 45/12-L Firdous (Sahiwal)	2
16	Govt. Higher Secondary School,Okanwala (Sahiwal)	3
TOTAL		40

ANNEXURE – 2

Table 3.2 **List of Female Science Teachers**

Sr. No	Name of Institutions	No. of Teachers
1	Govt. Girls Higher Secondary School, 45/12L, Chichawatni.	2
2	Govt. Girls Higher Sec. School, Iqbal Nagar, Chichawatni.	3
3	Govt. Girls Higher Secondary School, Farid Town, Sahiwal.	3
4	Govt. Girls Higher Secondary School, Harrapa, Sahiwal.	2
5	Govt. Girls H/S/School 48/12-L, Sahiwal.	1
6	Govt. Girls H/S School, 114/7-R Chichawatni, Sahiwal.	1
7	Govt. Girls Higher Secondary School Gaoshalla, Chichawatni	3
8	Govt. Girls Higher Secondary School, 26/14-L Sahiwal	2
9	Govt. Girls Higher Secondary School, Jahaz Ground Sahiwal.	3
10	Govt. Girls Higher Sec. School 120/9-L Kamir (Sahiwal)	2
11	Govt. Girls Higher Secondary School, 73/5-L (Sahiwal)	2
12	Govt. Girls Higher Secondary School Noor Shah, (Sahiwal)	1

13	Govt. Girls H.S.S. 62/12-L Distt. (Sahiwal)	2
14	G. G. Higher Secondary School, 96/12-L Chichawatni (Sahiwal)	2
15	Govt. Girls Higher Secondary School, Renala Khurd(Okara)	3
16	Govt. Girls Higher Secondary School, Qabula (Pakpattan)	2
17	Govt. Girls Higher Secondary School, Malka Hans Pakpattan.	3
18	Govt. Higher Secondary School, 127/EB (Pakpattan)	2
19	Govt. Girls Higher Secondary School, Chichawatni	3
TOTAL		42

ANNEXURE – 3

Questionnaire for the Science Subject Specialists of Higher Secondary Schools

Respected Teachers,

Assalam-o-Alaikum!

I am Ph.D. Scholar in the Department of Education in the International Islamic University, Islamabad and a Master Level thesis has to submit as a pre-requisite of Ph.D. Education Programme. For this purpose I am conducting a research on *"Problems of Science Teaching at Higher Secondary Schools in Sahiwal Division"* under the guidance of Dr. Muhammad Munir Kayani, *Department Of Education*, IIUI.

The researcher will appreciate if you kindly spare some precious moments to complete and return the questionnaire at an early time.

The researcher assures you that the information so collected will be kept confidential and will only be used for the present research.

Thanks.

(*Muhammad Ajmal Farooq*)

Researcher

Department of Education, IIUI.

QUESTIONNAIRE FOR SCIENCE TEACHERS

Part – I

Curriculum Vitae

Name:---------- Sex:----------

Name of Institution:----------

Designation:---------- Teaching Experience:----------

Qualifications: 1. Academic:---------- 2. Professional:----------

Part – II

Instructions

There are two columns shown against each statement. Tick (√) in the column of yes if you agree with the statement. If you disagree, tick (√) in the column of No.

A. Personal Questions

S. No	statements	Yes	No
1	Your post is according to your qualification.		
2	You are satisfied with your present status.		
3	The Govt. has provided a residential facility.		
4	Scholarship facilities for your family are available.		
5	You have proper medical facilities.		

B. Laboratory Facilities

S. No	Statements	Yes	No
1	Lab. Units is available in your school.		
2	Qualified Lab. Attendant is available.		
3	You are allowed to work in the Lab at any time.		
4	Capacity of Lab. As compared to students is sufficient.		
5	Govt. provides sufficient funds for the purchase of science equipments.		
6	Lab. Unit of your school is well equipped with apparatus.		
7	Chemicals are available in the laboratory.		
8	Water and gas supply is available.		

C. Library Facilities

S. No	Statements	Yes	No
1	Your school has library.		
2	Principal/Headmaster takes interest in improvement of library.		
3	Library closes earlier.		
4	Library facilities are satisfactory.		
5	Books on science are in sufficient quantity.		

6	Library opens in time.		
7	Time allocation for practical work is suitable.		

D. Science Curriculum

S. No	Statements	Yes	No
1	Science curriculum fulfills the requirements of modern time.		
2	Topics are introduced in detail.		
3	Most of the content of science books has no concern with our daily life.		
4	Curriculum promoted social values.		
5	Curriculum does not include technical and vocational subjects.		
6	Time allocation for theory work is suitable.		

E. Audio - Visual Aids

Following Audio Visual Aids are available in your institution

S. No	Audio Visual Aids	Yes	No
1	Models.		
2	Charts.		
3	Black Board.		

4	Coloured Chalks.		
5	Duster.		
6	Tape Recorder.		
7	Television.		
8	Slide Projector.		
9	Film Projector.		
10	Over head Projector.		
11	Flat Picture.		
12	Maps.		
13	Posters.		
14	Cartoons.		
15	Radio.		

16 - Any other. (please specify)----------

F. Miscellaneous

S. No	Statement	Yes	No
1	Science teaching staff is available according to the		

	strength of the students.		
2	Parents of your pupils' co – ordinate with you.		
3	You receive encouragement from administration.		
4	You are satisfied with the present assessment system.		
5	Staff – room for teachers is available.		
6	Tutorial system functions in your institution.		

Part – III

Problems/ Suggestions

Give your suggestions for the improvement of laboratory:

1.----------

2.----------

Give your suggestions for the improvement of library:

i. ----------

---

ii. ----------

List below science teaching problems:

i. ----------

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ii. ----------

ANNEXURE – 4

QUESTIONNAIRE FOR THE SCIENCE STUDENTS

Dear students, Assalam-o-Alaikum!

I am Ph.D. Scholar in the Department of Education in the International Islamic University, Islamabad and a Master Level thesis has to submit as a pre-requisite of Ph.D. Education Programme. For this purpose I am conducting a research on *"Problems of Science Teaching at Higher Secondary Schools in Sahiwal Division"* under the guidance of *Muhammad Munir Kayani, (AP) Department Of Education*, IIUI.

The researcher will appreciate if you kindly spare some precious moments to complete and return the questionnaire at an early time.

The researcher assures you that the information so collected will be kept confidential and will only be used for the present research.

Thanks.

(*Muhammad Ajmal Farooq*)

Researcher
Department of Education, IIUI.

Part – I

Name:---------- Sex----------

Institution:----------

Class:---------- Subjects: Medical / Non Medical----------

Part – II

Instructions

There are three parts of questionnaire. Please fill in every part honestly and fairly. Many options are given in Part – II under A, B. and G for every question. You may circle the one option as you decide. In Part – II under C, D, E, F, your response answer is required in form of "Yes" or "No". Please (√) in the one column. While in Part – III you have to write your own problems / suggestions.

A. Educational Problems

S. No	Statement	Options
1	You read science.	Due to parents. Due to teachers. Due to your own will.
2	You take much interest in	Biology Mathematics

		Physics Chemistry.
3	Reason of difficulty of subject is	Material of book. Teaching method. Lack of interest
4	You learn science lesson by	Writing. Understanding. Memorization.
5	You do your science practicals	Round the year. At the end of the year. During the summer vacations.
6	Practicals are performed by	Every student. Group. Teacher himself.
7	You want to read	Text – books. Notes. Both.
8	You used unfair means in examination to	Get through.

		Get further admission. Secure good job.

B. Personal Matters

Sr. No	Statement	Yes	No
1	Your parents are educated.		
2	Your parents are invited to inform the results.		
3	You have proper time for reading.		
4	You can meet the expenses incurred on science education.		
5	Medical facilities are provided to you.		
6	You feel hesitate for asking any explanation from your teachers.		

C. Teachers' Attitude

S. No	Statement	Options
1	Your science teacher behave with you	Strictly. Softly. Both ways.
2	You are satisfied by teaching	Yes

		To some extent. Not at all.
3	Your teacher compels you for tuition	Yes No. Against tuition.

D. Laboratory Facilities

S. No	Statement	Yes	No
1	Laboratory has modern facilities.		
2	Laboratory is well equipped.		
3	Demonstration table is available in the science laboratory.		

E. Library Facilities

S. No	Statement	Yes	No
1	You are satisfied with science books in your library.		
2	Debates are arranged on science topics.		
3	Newspapers are supplied regularly.		
4	Science tours are arranged for students.		

F. Syllabus

S. No	Statement	Yes	No
1	Syllabus is long.		
2	Syllabus is short.		
3	Your teachers finish syllabus in time.		
4	Syllabus is easy.		
5	Syllabus is difficult.		

G. Miscellaneous Questions

S. No	Statement	Options
1	You prepare for examination	All chapters. Some chapters. Important topics.
2	Your teachers use A.V.Aids	Some times. Often. Never.
3	Admission policy is based on	Pure merit Interview. Both.

PART - III

PROBLEMS/ SUGGESTIONS

1. Discuss your science problems, if any.

i. ----------

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ii. ----------

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iii. ----------

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2. Give some suggestions, if any.

i. ----------

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ii. ----------

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iii. ----------
