



A Study of the Skills of the Students Related to the Chemistry Laboratory of Higher Secondary School

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Abstract:

Generally it is seen that the students have negative attitude towards Chemistry laboratory and experiments. Moreover, there is risk in working in chemistry lab. The development of quality working skills and safety skills develops positive attitude towards the study of Chemistry and it becomes useful for developing scientific viewpoint. In the present research paper the important skills which are necessary for students in chemistry lab have been discussed.

1. Drawing skills
2. Manipulative and Procedural Skills
3. Observational Skills
4. Cleaning and Safety Skills
5. Reporting and interpretative Skills

The necessary skills of chemistry lab can be categorized in five types. The full fledged development of these skills leads the students at the heights of science education. Thus, for qualitative development of these skills proper teaching methods and evaluation methods for measurement become inevitable.

Keywords: Chemistry, Skill, Laboratory

1. Introduction

Different education commissions have been formed for educational reforms in the world of education both at the national level and international level as well. Lots of money are spends for the purpose but even after that, the real aims and objectives cannot be achieved. Education is becoming just a medium of earning livelihood or money. Now a day the meaning of education for teachers and students is like this: "The teacher emphasizes on teaching the pages of the textbooks for completing the course. And students believe in getting higher scores in examinations by cramming the pages of books." Enabling the students to think, nourishing their curiosity, developing the qualities of perseverance, accuracy, observational skills and decision making skills are becoming secondary thing or given less importance. Why has such condition taken place? The answer to this very crucial question can be given like this: "Our traditional methods of teaching are responsible for it." In today's examination system it seems that the sole focus is on testing the students' memory instead of testing their qualities, skills and abilities.

Even the subject like Science is also taught through lecture method. It is seen that the practicals are done just as a part of curriculum but most of the students and teachers do it without seriousness. Positive attitude towards practical work is necessary to develop scientific attitude and required skills among the students of higher secondary schools. Teacher should also have positive attitude and should motivate the students towards experimentation and practical works. Traditional types of tests can not be useful for testing the students' practical skills required in practical labs of science stream schools. For qualitative evaluation of the students' practical skills the interactive test (action research

type tests) through which the students' practical work can be observed is necessary. In addition to that the safety related skills should also be developed among the students in the practical labs. Along with that its measurement should also be done carefully.

“Chemistry is an experimental Science and its development and Application demands a high standard of experimental work.”

The above mentioned statement indicates the importance of experimental work in the subject of Chemistry. The principles of Chemistry should be explained through experiments and practicals in laboratory. It is only through the experiments that new scientific principles and mysteries can be discovered and established. The qualitative development of experimentation skills and laboratory related skills in the schools motivate the students to become scientists. Very few students prefer Chemistry as a career option. Its one reason is that the students feel it very difficult to learn laboratory related skills of Chemistry at school level. But if from very beginning of the school level proper environment is created to develop laboratory related skills, it can be helpful to develop their aptitude for the subject. Keeping this thing into consideration the special care should be taken personally for the students to develop experimentation skills necessary in chemistry laboratory. These skills have been discussed as under.

2. Drawing Skill

In Chemistry laboratory before arranging the equipments for experiments, they draw them on paper in form of the figure as a part of the experiment. Then they arrange the real equipments according to the steps of experiments. Along with that, the observation table is also prepared to note down the observations during the experiments. The final table is also prepared to note down the findings of the experiments. The skill of preparing the figures, observation table and the finding tables is known as drawing skill. Doing experimentation with the knowledge of indication of different units of the experiments and noting down the observation and findings is a part of drawing skill. This primary skill gives the experimenter a good beginning. It becomes useful to lead the student towards exact and accurate observations and findings.

3. Manipulative and Procedural Skills

Manipulative and Procedural Skills are very useful while working in laboratory. For these types of skills experimenter's intelligence and physical abilities and stamina play an important role. Both knowledge and physical abilities are required for these skills. Proper arrangements of the equipments, identification and finalization of cluster solutions; being careful about safety and knowledge of using particular equipments are included in operating skills of experimentation. The knowledge and acquisition of these skills save the students from the mistakes and faults that arise during the observation and the findings. These skills also cultivate the qualities of perseverance and patience.

4. Observational Skills

Observations of experiments had big effect on the findings and the result in the laboratory. Observational skills help to develop qualities like observation ability and accuracy in students. Correct and accurate observations lead the researcher toward the exact and accurate result. In short the observation decides the findings of the experiment. In this situation it is expected that students must have well developed observational skills. Taking the observations requires cautiousness and care. Even a small mistake of observations may result in wrong findings. Both the knowledge of good observation and correct method of observation are inevitable for accurate and correct observation.

5. Cleaning and Safety Skills

In most of the experiments in chemistry culture solution and water are used. If the skills related to safety and cleanliness are not developed in students, the experiment table remains dirty. If the used equipments are not cleaned before reusing, the chemical side effect of that remains in them affects the result of the experiment. The students have to work with acid-base chemicals. Some chemicals are very poisonous. So it is very essential that the students have safety related quality skills. The cleaning and safety related skills consist of taking culture solutions in byureta, conical flask or beaker; the care taken while mixing the chemicals, identifying the smell of chemicals for the selection, the skills needed for heating up the chemicals, the skills need to clean the equipments after the completion of experiments, hand washing skill, wearing apron, etc.

6. Reporting and Interpretative Skills

At the end of any experiment the skills of report writing and the other related skills are very important. On the basis of the exact observations during the experiment statistical analysis and interpretation is worked out. These types of skills become helpful in developing the students' decision making skills and insight. The lack of effective and significant reporting makes the experiment dull. In such situation preparing a good report and its presentation become very essential. Thus the skills related with reporting and interpretation skills develop decision making skills, insight and the skill of presentation. The student presents his or her findings and result along with exact ground proofs. The skills of balancing the formulas of chemical process, statistical skills and the use of different formulas are included in reporting skill and interpretation skill.

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