

## How to Develop Institutions by Improving Technical Education

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### *Introduction*

Technology education teaches skills which are directly related to a specific job or profession, as opposed to academic education which looks at a subject in a more abstract way. Technology education emphasizes the understanding and practical application of basic principles of science and industry, rather than the attainment of proficiency in manual skills that is properly the concern of education. Its objectives are the preparation of graduates for occupations that are classed above the skilled crafts but below the scientific or engineering professions. People so employed are frequently called technicians.

Technology occupations are vital in a wide range of fields typically offered in Technology institutes, junior colleges, vocational schools, and regular colleges and universities. Specialists with higher Technology educations are trained in poly- Technology and industrial institutes, specialized higher Technology educational institutions and in the Technology departments of several universities. (Rebecca, 2002)

During the program, students independently carry out a series of assignments and course projects. In the final semesters, students complete three to five course projects in their specialty. Students gain practical experience in student workshops and training grounds and in production training in factories.. Special laboratories and computer centers have been organized to raise the level of scientific research in higher Technology educational institutions. (sambain,2008)

Technology education is the need of the hour. The entire history of the rise, progress and development of advanced countries shows that they have given due consideration and importance to Technology education and all their progress owes a lot to the advancement and priority given to Technology education. In the present day of hard struggle and competition, general education cannot meet the demands and needs of people therefore learning of Technology education has become an important factor and it is in high demand these days. The unemployment problem is increasing day by day which is making people more discontent, restless and worried all the time. In this situation Technology education can help a lot to refrain from this problem. Technology education is also known as vocational education that teaches us how to earn the bread and butter for life. (Mughairi,2001)

Purpose of Technology education is to provide Technology skill and an opening in a practical career for those large numbers of students.

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It is the education which trains a person in one of the different practical and useful arts such as wood working, metal working, electricity and electronics, technology, engineering graphics, arts and crafts etc. (malik,2013)

Effective and good technological education will offer to promise good Technologies which will definitely provide their input in terms of the success of the country. Technology education has been known to increase productivity of individuals, profitability of employers and expansion of national development. A 'knowledgeable' workforce, one that is both highly skilled in a particular occupation and also exhibits flexibility, is seen as the most important human capital required for the development of a country.

The aim of Technology education is to provide instruction and training in skills that have a practical utility. It helps us to meet the needs of the industrial age. Technology education is very important in the modern age. Technology education produces doers and workers. These workers make real and important contribution to the welfare of society. Technology education promotes the material prosperity and economic advancement. People begin to have faith in the dignity of labor. Technology education makes a country rich, prosperous and resourceful.

In Pakistan there is lack of Technology education. People don't consider this field or are ashamed of adopting this field. Researcher should join this field proudly. Today youngsters in Pakistan always think of office jobs and they dislike practical work or to work in factories and this is also one of the reasons that unemployment is widely spread in our country. Poverty is due to the negligence of Technology education.

Technology education will raise the working classes to a self-respect and dignity hitherto unknown among them. The time has come when the discoveries of science will be put into practical shape and the student will be taught to put into practice their theoretical knowledge. This can only be done with the help of Technology knowledge.

Therefore it is necessary that Technology institutes should be developed and secondly the idea of dignity of labor should be popularized. Researcher must keep in mind that progress is only possible through Technology education. It is high time that people should take more and more interest in Technology education to make our country strong technically and economically.

Master in Technology education offered in the institute of education and research department of Punjab University is the only master degree in technical education offered in Pakistan. Due to this unique characteristic it is very important that the training of the students should be up to the mark to fulfill the demand of the industry. But unfortunately the laboratory section of the department is facing serious deficiencies in all aspects.

Lack of up gradation and maintenance of machinery, improper arrangement of ventilation, no assurance of safety measures during work and lack of practical training facilities are some of the major problems which reduce the effectiveness of the program and thus the partially trained students are not capable to compete in their practical competition.

By realizing this situation researcher therefore decided to focus our research thesis to highlight the deficiencies in the existing facilities of the laborites and to give remedies for improvement in all aspects to insure that the upcoming students are trained more effectively which enable them to compete well in the industry.

In conclusion, it is very essential and crucial that effective and good quality Technology education is offered to all the individuals so that they excel in their professional life. Furthermore, this will then promote the name of Pakistan at an international level and will promise to provide positive impact on Pakistan's economy.

### ***Statement of the Problem***

The study is designed to define remedies for Improvement of Master of Technology Education Program: Focus on Wood, Metal and Electricity Laboratories.I.E.R.

### ***Objective of the Study***

The main objectives of the study are as follows:

1. To identify the existing facilities of the laboratories.
2. To know the working conditions of the laboratories.

### ***Significance of the Study***

This study may be helpful to;

1. The administration of the department to improve the facilities of the laboratories
2. The policy makers in their programs to fulfill the requirements of the industry.
3. To highlight the weaknesses of the laboratories for improvement.
4. Generate the new standards for the up gradation of laboratories.
5. Make recommendations for the improvement of laboratories.

### ***Research Questions***

1. What are the existing facilities in wood laboratory?
2. What are the existing facilities in metal laboratory?
3. What are the existing facilities in electricity laboratory?
4. What are the working conditions of wood laboratory?
5. What are the working conditions of metal laboratory?
6. What are the working conditions of electricity laboratory?

General laboratories have a central role in training technology students to provide industrial arts experience in wide variety of industrial activities. Laborites make it possible to offer a more varied program where students may be rotated through the various areas to provide subject matter experiences which have been selected from a wide variety of activities and arranged into a unified course to meet student needs of industry. The general laboratory may have provision for instruction in wood, metal, electricity, drafting, arts and craft.

Quality in the laboratory work is essential to ensure that students can learn accurately and are well trained to meet the market requirements .Laboratory quality can be defined as accuracy, reliability, and timeliness of the laboratory projects. The laboratory work must be as accurate as possible, all aspects of the laboratory work must be reliable, and finishing must be timely in order to make the students punctual. (manpower,2005)

### ***Procedure of the Study***

The review of the related literature and the importance of the laborites in technology education were presented in chapter II.

This chapter describing research methodology and procedure for conducting study, Remedies for Improvement of Master of Technology Education Program: Focus on Wood, Metal and Electricity Laboratories, the following method and procedure was adopted by the researchers in order to collect data and to reach at a reliable conclusion for given recommendations for the improvement of the program.

### ***Population of the Study***

In order to conduct research on the issue, population of the study consist of all the student of Master of Technology Education.

### ***Sample of the Study***

The researchers conducted their research to two hundred male and female students of session 2008-2010, 2009-2011, 2010-2012, 2011-2013 and 2012-2014 of Master of Technology Education, University of Punjab Lahore.

### ***Tool of the Study***

On the basis of the literature review, the researchers developed a comprehensive questionnaire themselves after an extensive study of related literature. The researchers adopted the technique of descriptive research. Descriptive research can be defined as:-

“Descriptive research involves collecting data in order to answer questions concerning the current status of subject of study”.

All the necessary information for the study and views of students obtained through the questionnaire. For the purpose questionnaire were prepared by using Likert scale in which an individual is asked to respond to a series of statement by indicating whether he or she strongly agree (SA), agree (A), neutral (N), strongly disagree (SD) with the each statement. There were three parts in the questionnaire; one was about the wood lab second about metal lab and third about electricity lab. Questionnaire Comprised of thirteen items in each three sections to know the opinion of the students regarding the existing and required facilities in each three laboratories. Respondent were required to tick mark the most suitable response out of the given choices.

### ***Administration of Questionnaire***

Questioners were filled in the presence of the researchers and they administer the questionnaire themselves. In the questionnaire researcher assess the existing facilities of the concern laboratories and give recommendations for improvement.

### ***Data Analysis***

All data was computer by utilized the SPSS-15 software package.

### **Wood laboratory**

#### **Statement no.1**

Lab attendant is good in performing practical work.

**Table 1.1**

	<b>Frequency</b>	<b>Percent</b>
<b>Strongly Agree</b>	76	38
<b>Agree</b>	116	58
<b>Neutral</b>	8	4.0
<b>Total</b>	200	100.0

*Graphical representation is:*

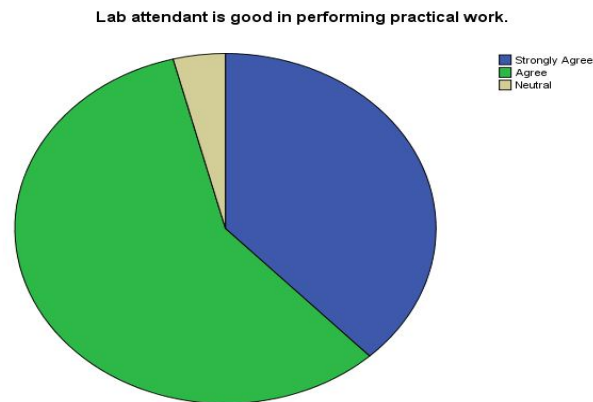


Table 1.1 represent that 38% respondents are strongly agree that Lab attendant is good in performing practical work, 58% respondents are agree and 4% respondents are neutral regarding the statement.

#### **Statement no.2**

Related staff is cooperative.

**Table 1.2**

	<b>Frequency</b>	<b>Percent</b>
<b>Strongly Agree</b>	108	54
<b>Agree</b>	85	42.5
<b>Neutral</b>	7	3.5
<b>Total</b>	200	100.0

*Graphical representation is:*

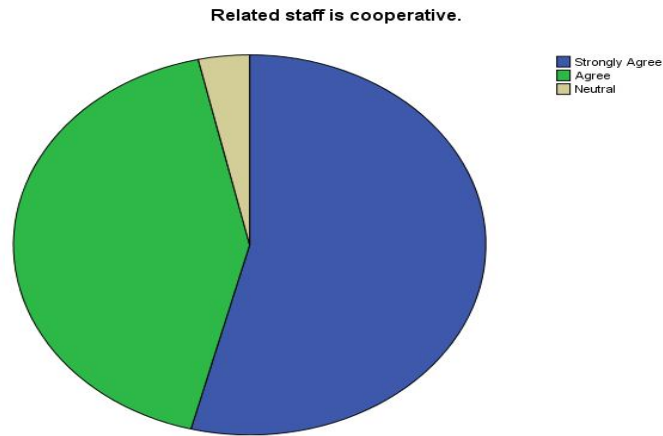


Table 1.2 represent that 54% respondents are strongly agree that related staff is cooperative, 52.5% respondents are agree de and 3.5% respondents are neutral regarding the statement.

**Statement no.3**

Related staff is punctual.

**Table 1.3**

	<b>Frequency</b>	<b>Percent</b>
<b>Strongly Agree</b>	85	42.5
<b>Agree</b>	75	37.5
<b>Neutral</b>	28	14
<b>Disagree</b>	8	4
<b>Strongly Disagree</b>	4	2
<b>Total</b>	<b>200</b>	<b>100.0</b>

*Graphical representation is:*

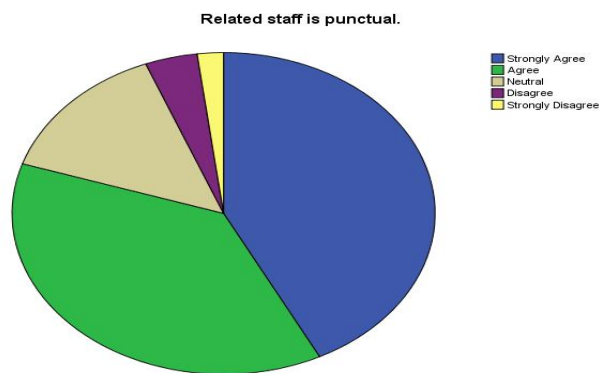


Table 1.3 represent that 42.5%respondents are strongly agree thatrelated staff is punctual,37.5% respondents are agree, 14% respondents are neutral, 4% respondents are disagree and 2% respondents strongly disagree regarding the statement.

#### Statement no.4

Sufficient raw material is available for all students.

**Table 1.4**

	<b>Frequency</b>	<b>Percent</b>
<b>Strongly Agree</b>	49	24.5
<b>Agree</b>	94	47.0
<b>Neutral</b>	29	14.5
<b>Disagree</b>	28	14.0
<b>Total</b>	200	100.0

*Graphical representation is:*

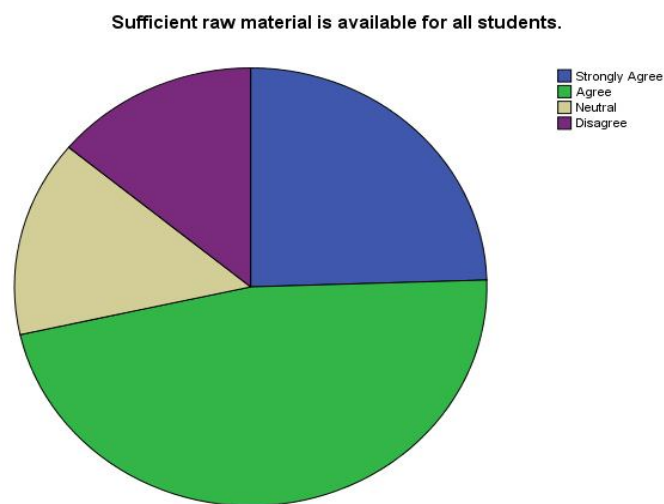


Table 1.4 represent that 24.5%respondents are strongly agree thatsufficient raw material is available for all students,47% respondents are agree, 14.5% respondents are neutral, 14% respondents are disagree regarding the statement.

**Statement no.5**

Sufficient number of tools and machines are available for all students.

**Table 1.5**

	<b>Frequency</b>	<b>Percent</b>
<b>Strongly Agree</b>	40	20.0
<b>Agree</b>	74	37.0
<b>Neutral</b>	31	15.5
<b>Disagree</b>	42	21.0
<b>Strongly Disagree</b>	13	6.5
<b>Total</b>	200	100.0

*Graphical representation is:*

Sufficient number of tools and machines are available for all students.

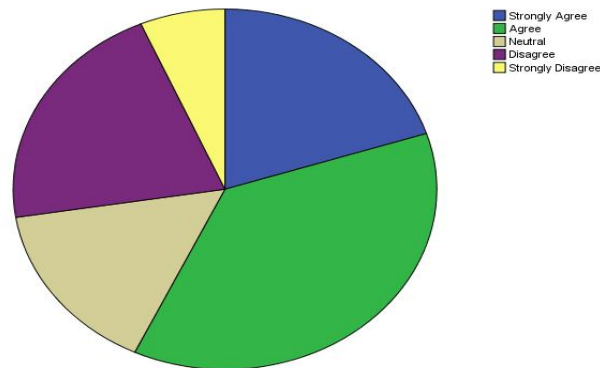


Table 1.5 represent that 20% respondents are strongly agree that sufficient number of tools and machines are available for all students, 37% respondents are agree, 15.5% respondents are neutral, 21% respondents are disagree and 6.5% respondents strongly disagree regarding the statement.

**Statement no.6**

Up gradation and maintenance of machines is done regularly.

**Table 1.6**

	<b>Frequency</b>	<b>Percent</b>
<b>Strongly Agree</b>	9	4.5
<b>Agree</b>	18	9.0
<b>Neutral</b>	24	12.0
<b>Disagree</b>	83	41.5
<b>Strongly Disagree</b>	66	33.0
<b>Total</b>	200	100.0



*Graphical representation is:*

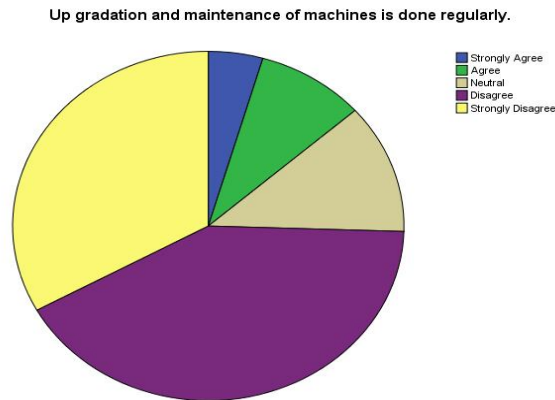


Table 1.6 represent that 4.5% respondents are strongly agree that up gradation and maintenance of machines is done regularly, 9% respondents are agree, 12% respondents are neutral, 41.5% respondents are disagree and 33% respondents strongly disagree regarding the statement.

**Statement no.7**

Safety measures are ensured while students are at work.

**Table 1.7**

	<b>Frequency</b>	<b>Percent</b>
<b>Strongly Agree</b>	4	2.0
<b>Agree</b>	22	11.0
<b>Neutral</b>	20	10.0
<b>Disagree</b>	102	51.0
<b>Strongly Disagree</b>	52	26.0
<b>Total</b>	200	100.0

*Graphical representation is:*

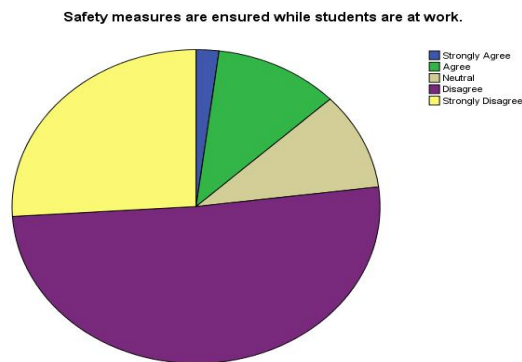


Table 1.7 represent that 2%respondents are strongly agree thatsafety measures are ensured while students are at work,11% respondents are agree, 10% respondents are neutral, 51% respondents are disagree and 26% respondents strongly disagree regarding the statement.

**Statement no.8**

You are provided practical training facilities in your wood laboratory.

**Table 1.8**

	<b>Frequency</b>	<b>Percent</b>
<b>Strongly Agree</b>	12	6.0
<b>Agree</b>	31	15.5
<b>Neutral</b>	70	35.0
<b>Disagree</b>	47	23.5
<b>Strongly Disagree</b>	40	20.0
<b>Total</b>	200	100.0

*Graphical representation is:*

You are provided practical training facilities in your wood laboratory.

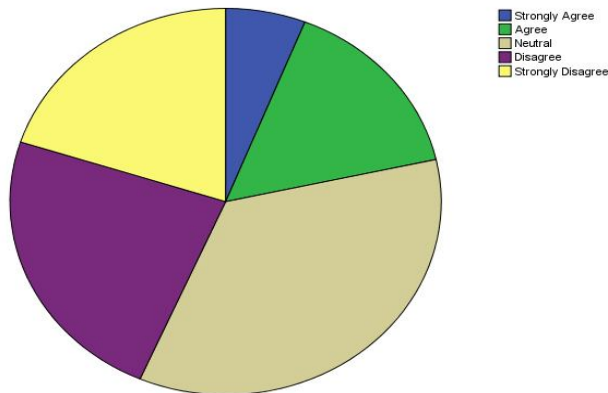


Table 1.8 represent that 6%respondents are strongly agree that they are provided practical training facilities in wood laboratory.,15.5% respondents are agree, 35% respondents are neutral, 23.5% respondents are disagree and 20% respondents strongly disagree regarding the statement.

**Statement no.9**

Arrangement of ventilation is proper while doing work.

**Table 1.9**

	Frequency	Percent
<b>Strongly Agree</b>	31	15.5
<b>Agree</b>	126	63.0
<b>Neutral</b>	13	6.5
<b>Disagree</b>	25	12.5
<b>Strongly Disagree</b>	5	2.5
<b>Total</b>	200	100.0

*Graphical representation is:*

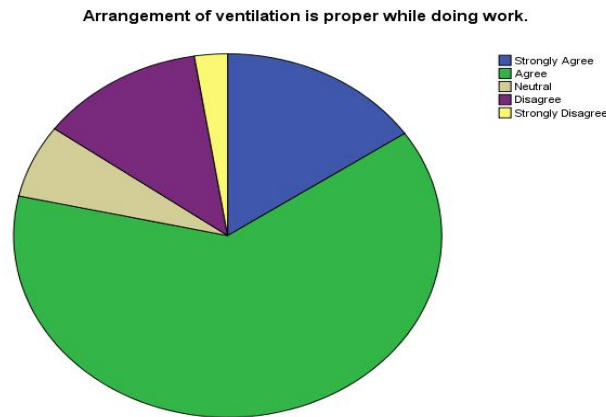


Table 1.9 represent that 15.5% respondents are strongly agree that the arrangement of ventilation is proper while doing work, 63% respondents are agree, 6.5% respondents are neutral, 12.5% respondents are disagree and 2.5% respondents strongly disagree regarding the statement.

**Statement no.10**

Normal temperature is maintained in laboratory during work.

**Table 1.10**

	Frequency	Percent
<b>Strongly Agree</b>	54	27.0
<b>Agree</b>	92	46.0
<b>Neutral</b>	27	13.5
<b>Disagree</b>	20	10.0
<b>Strongly Disagree</b>	7	3.5
<b>Total</b>	200	100.0

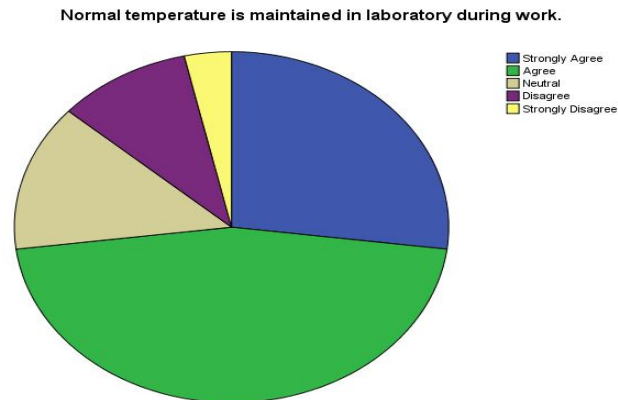
**Graphical representation is:**

Table 1.10 represent that 27% respondents are strongly agree that normal temperature is maintained in laboratory during work, 46% respondents are agree, 13.5% respondents are neutral, 10% respondents are disagree and 3.5% respondents strongly disagree regarding the statement.

**Findings**

Items were analyzed by using SPSS, which were presented in tabular form, finding about the statements were as follows:

1. 38% respondents are strongly agree that Lab attendant is good in performing practical work, 58% respondents are agree and 4% respondents are neutral regarding the statement.
2. 54% respondents are strongly agree that related staff is cooperative, 52.5% respondents are agree and 3.5% respondents are neutral regarding the statement.
3. 42.5% respondents are strongly agree that related staff is punctual, 37.5% respondents are agree, 14% respondents are neutral, 4% respondents are disagree and 2% respondents strongly disagree regarding the statement.
4. 24.5% respondents are strongly agree that sufficient raw material is available for all students, 47% respondents are agree, 14.5% respondents are neutral, 14% respondents are disagree regarding the statement.
5. 20% respondents are strongly agree that sufficient number of tools and machines are available for all students, 37% respondents are agree, 15.5% respondents are neutral, 21% respondents are disagree and 6.5% respondents strongly disagree regarding the statement.
6. 4.5% respondents are strongly agree that up gradation and maintenance of machines is done regularly, 9% respondents are agree, 12% respondents are neutral, 41.5% respondents are disagree and 33% respondents strongly disagree regarding the statement.
7. 2% respondents are strongly agree that safety measures are ensured while students are at work, 11% respondents are agree, 10% respondents are neutral, 51% respondents are disagree and 26% respondents strongly disagree regarding the statement.
8. 6% respondents are strongly agree that they are provided practical training facilities in wood laboratory., 15.5% respondents are agree, 35% respondents are neutral, 23.5% respondents are disagree and 20% respondents strongly disagree regarding the statement.
9. 15.5% respondents are strongly agree that the arrangement of ventilation is proper while doing work, 63% respondents are agree, 6.5% respondents are neutral, 12.5% respondents are disagree and 25% respondents strongly disagree regarding the statement.

10. 27% respondents are strongly agree that normal temperature is maintained in laboratory during work, 46% respondents are agree, 13.5% respondents are neutral, 10% respondents are disagree and 3.5% respondents strongly disagree regarding the statement.
11. 20% respondents are strongly agree that they are satisfied with environment of the laboratory, 51% respondents are agree, 13.5% respondents are neutral, 11.5% respondents are disagree and 4% respondents strongly disagree regarding the statement.
12. 47.5% respondents are strongly agree that laboratory is mostly available for work after class time, 40% respondents are agree, 7.5% respondents are neutral, 4.5% respondents are disagree and 0.5% respondents strongly disagree regarding the statement.
13. 13% respondents are strongly agree that they are satisfied with laboratory facilities, 59.5% respondents are agree, 9% respondents are neutral, 12.5% respondents are disagree and 6% respondents strongly disagree regarding the statement.
14. 17% respondents are strongly agree that lab attendant is good in performing practical work., 50% respondents are agree, 20% respondents are neutral, 12% respondents are disagree and 0.5% respondents strongly disagree regarding the statement.
15. 9.5% respondents are strongly agree that related staff is punctual, 30.5% respondents are agree, 12.5% respondents are neutral, 25% respondents are disagree and 22.5% respondents strongly disagree regarding the statement.
16. 16% respondents are strongly agree that related staff is cooperative , 34.5% respondents are agree, 13.5% respondents are neutral, 21% respondents are disagree and 15% respondents strongly disagree regarding the statement.
17. 6.5% respondents are strongly agree that sufficient raw material is available for all students, 34.5% respondents are agree, 11.5% respondents are neutral, 38.5% respondents are disagree and 9% respondents strongly disagree regarding the statement.
18. 8.5% respondents are strongly agree that sufficient number of tools and machines are available for all students, 35.5% respondents are agree, 8.5% respondents are neutral, 21.5% respondents are disagree and 26% respondents strongly disagree regarding the statement.
19. 5.5% respondents are strongly agree that up gradation and maintenance of machines is done regularly, 4% respondents are agree, 7.5% respondents are neutral, 42.5% respondents are disagree and 40.5% respondents strongly disagree regarding the statement.
20. 1.5% respondents are strongly agree that safety measures are ensured while students are at work, 9.5% respondents are agree, 14.5% respondents are neutral, 42% respondents are disagree and 32.5% respondents strongly disagree regarding the statement.
21. 4.5% respondents are strongly agree that they are provided practical training facilities in metal laboratory, 10.5% respondents are agree, 41% respondents are neutral, 25.5% respondents are disagree and 18.5% respondents strongly disagree regarding the statement.
22. 6% respondents are strongly agree that Arrangement of ventilation is proper while doing work, 28.5% respondents are agree, 25.5% respondents are neutral, 28.5% respondents are disagree and 11.5% respondents strongly disagree regarding the statement.
23. 5% respondents are strongly agree that Normal temperature is maintained in laboratory during work, 33.5% respondents are agree, 28.5% respondents are neutral, 22% respondents are disagree and 11% respondents strongly disagree regarding the statement.
24. 6% respondents are strongly agree that they are satisfied with environment of the laboratory, 32.5% respondents are agree, 23% respondents are neutral, 31.5% respondents are disagree and 7% respondents strongly disagree regarding the statement.
25. 14.5% respondents are strongly agree that laboratory is mostly available for work after class time , 69.5% respondents are agree, 8% respondents are neutral, 6.5% respondents are disagree and 1.5% respondents strongly disagree regarding the statement.
26. 6% respondents are strongly agree that they are satisfied with laboratory facilities, 24.5% respondents are agree, 20.5% respondents are neutral, 33.5% respondents are disagree and 15.5% respondents strongly disagree regarding the statement.

27. 9.5% respondents are strongly agree that lab attendant is good in performing practical work, 59% respondents are agree, 8% respondents are neutral, 22% respondents are disagree and 1.5% respondents strongly disagree regarding the statement.
28. 12.5% respondents are strongly agree that related staff is punctual, 40% respondents are agree, 8% respondents are neutral, 23.5% respondents are disagree and 14% respondents strongly disagree regarding the statement.
29. 15.5% respondents are strongly agree that related staff is cooperative, 34.5% respondents are agree, 17.5% respondents are neutral, 21% respondents are disagree and 11.5% respondents strongly disagree regarding the statement.
30. 9% respondents are strongly agree that sufficient circuits are available for all students, 34% respondents are agree, 14% respondents are neutral, 34.5% respondents are disagree and 8.5% respondents strongly disagree regarding the statement.
31. 4% respondents are strongly agree that sufficient numbers of meters are available for all students, 4.5% respondents are agree, 10.5% respondents are neutral, 28.5% respondents are disagree and 54.5% respondents strongly disagree regarding the statement.
32. 2% respondents are strongly agree that safety measures are ensured while students are at work, 18% respondents are agree, 8.5% respondents are neutral, 40% respondents are disagree and 31.5% respondents strongly disagree regarding the statement.
33. 0.5% respondents are strongly agree that they are provided practical training facilities in electricity laboratory., 8% respondents are agree, 33.5% respondents are neutral, 38.5% respondents are disagree and 19.5% respondents strongly disagree regarding the statement.
34. 3.5% respondents are strongly agree that arrangement of ventilation is proper while doing work., 54.5% respondents are agree, 25.5% respondents are neutral, 7.5% respondents are disagree and 9% respondents strongly disagree regarding the statement.
35. 17.5% respondents are strongly agree that normal temperature is maintained in laboratory during work., 49.5% respondents are agree, 14.5% respondents are neutral, 15.5% respondents are disagree and 3% respondents strongly disagree regarding the statement.
36. 13% respondents are strongly agree that they are satisfied with environment of the laboratory, 41% respondents are agree, 15% respondents are neutral, 20.5% respondents are disagree and 10.5% respondents strongly disagree regarding the statement.
37. 3.5% respondents are strongly agree that electricity lab is shock proof, 22% respondents are agree, 8.5% respondents are neutral, 20% respondents are disagree and 46% respondents strongly disagree regarding the statement.
38. 12.5% respondents are strongly agree that laboratory is mostly available for work after class time., 65% respondents are agree, 8% respondents are neutral, 12% respondents are disagree and 2.5% respondents strongly disagree regarding the statement.
39. 3% respondents are strongly agree that they are satisfied with laboratory facilities, 29.5% respondents are agree, 20% respondents are neutral, 26% respondents are disagree and 21.5% respondents strongly disagree regarding the statement.

### ***Conclusions***

In this research the main objective of the researchers is that, to identify all the shortcomings of the respective laboratories and to give remedies for their improvement.

The Conclusions of the research study is that the respondents are well aware about existing facilities of the laboratories and provide quality responses to overcome the shortcomings.

As by the result of the general findings, majority of the respondents are quite satisfied with the facilities of the Wood laboratory while there are few concerns regarding the metal laboratory and electricity laboratory is worst according to the research study.

### ***Recommendations***

Following Recommendations weremade on the bases of the conclusion and findings.

Based on the findings of the study, following Recommendations are offered

- Related Staff should be encouraged and motivated to cooperate with the students.
- Sufficient amount of raw material should be available for students to work.
- Department need to arrange more tools and machines to facilitate students.
- Up gradation and of machines should be done periodically to ensure their smooth working.
- Practical training facilities need to be enhanced to fulfill the student's needs.
- Proper ventilation system is very important for labs to maintain normal temperature during practical work.
- Machines selected for the lab must be fully guarded for safety.
- Lab safety rules should be clear, simply written, and posted in the classroom.
- Wear eye protection, aprons, and gloves when necessary.
- Clean up all work areas and dispose of materials properly.
- Keep work areas neat and organized.
- Don't wear loose or baggy clothing or jewelry when using tools.
- Fire extinguisher(s) should be fully charged and readily available, and staff should be trained to use them. Fire blankets should be within easy reach.
- Ventilation should provide for regular air exchange within the room.
- Students should be supervised by an adult at all times

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