

## **Difficulties Faced by Students in Understanding Word Problems and Translating into Algebraic Equation**

**Mugdha Sangelkar**

Pal Rajendra B.Ed College, Mumbai-400101, Maharashtra, India

---

### **Abstract**

Mathematics is a powerful tool with many applications. Advanced mathematical training can lead to many career opportunities, including business, finance, medicine, engineering, and basic sciences. At the same time, mathematics is a self-contained subject that is worth studying simply for its elegance. While challenging at times, the study of mathematics can bring a tremendous sense of accomplishment. Mathematics is an ideal subject for people who enjoy abstract thinking. Mathematics relies on both logic and creativity, and it is pursued both for a variety of practical purposes and for its intrinsic interest. For some people, and not only professional mathematicians, the essence of mathematics lies in its beauty and its intellectual challenge. For others, including many scientists and engineers, the chief value of mathematics is how it applies to their own work. Because mathematics plays such a central role in modern culture, some basic understanding of the nature of mathematics is requisite for scientific literacy. To achieve this, students need to perceive mathematics as part of the scientific endeavour, comprehend the nature of mathematical thinking, and become familiar with key mathematical ideas and skills. This research paper focuses on mathematics as part of the scientific endeavour and then on mathematics as a process, or way of thinking.

---

## **INTRODUCTION**

### **1.1 Meaning of Mathematics**

Mathematics is an old, broad and deep discipline (field of study) people working to improve math education need to understand “what is mathematics”

Mathematics is the science that deals with the logic of shape, quantity and arrangement. Math is all around us, in everything we do. It is the building block for everything in our daily lives, including mobile devices, architecture (ancient and modern), art, money, engineering, and even sports. Mathematics is the study of the measurement, properties, and relationships between abstract mathematics .

Since the beginning of recorded history, mathematic discovery has been at the forefront of every civilized society, and in use in even the most primitive of cultures. The needs of math arose based on the wants of society. The more complex a society, the more complex the mathematical needs. Primitive tribes needed little more than the ability to count, but also relied on math to calculate the position of the sun and the physics of hunting.

### **1.2 Nature of Mathematics**

Mathematics relies on both logic and creativity, and it is pursued both for a variety of practical purposes and for its intrinsic interest. For some people, and not only

professional mathematicians, the essence of mathematics lies in its beauty and its intellectual challenge. For others, including many scientists and engineers, the chief value of mathematics is how it applies to their own work. Because mathematics plays such a central role in modern culture, some basic understanding of the nature of mathematics is requisite for scientific literacy. To achieve this, students need to perceive mathematics as part of the scientific endeavour, comprehend the nature of mathematical thinking, and become familiar with key mathematical ideas and skills. This chapter focuses on mathematics as part of the scientific endeavour and then on mathematics as a process, or way of thinking. Recommendations related to mathematical ideas are presented in Chapter 9, The Mathematical World, and those on mathematical skills are included in Chapter 12, Habits of Mind.

### **1.3 Need of the study**

When I was teaching in internship I found that many student faced difficulty in word problem. According to me word problem teach children to become creative thinkers.

Mathematics is a powerful tool with many applications. Advanced mathematical training can lead to many career opportunities, including business, finance, medicine, engineering, and basic sciences.

At the same time, mathematics is a self-contained subject that is worth studying simply for its elegance. While challenging at times, the study of mathematics can bring a tremendous sense of accomplishment. Mathematics is an ideal subject for people who enjoy abstract thinking.

The following story illustrates the particular perspective that mathematics offers.

Two anthropologists and a mathematician were arguing about why humans had domesticated fire. One anthropologist argued that humans needed fire primarily to stay warm at night. The other anthropologist insisted that humans needed fire primarily to cook food. The mathematician proposed that some ancient human had been intrigued by fire and decided to figure out how it worked. Only later, suggested the mathematician, did others come along and find uses for fire

### **1.4 Statement of Aim**

Difficulties faced by student in understanding word problem and translating into algebraic equation.

### **1.5 Objectives of the study:**

1. To identify the difficulties in translating word problem in algebraic equations faced by 8<sup>th</sup> standard of English medium students.
2. To provide remedial measures for difficulties in translating word problems in algebraic equations among 8<sup>th</sup> standard English medium students.
3. To find out the difference between the pre-test and post-test scores of 8<sup>th</sup> standard English medium student in translating word problems in algebraic equations,

## 1.6 Hypothesis of the study:

### Null hypothesis:

- 1.HO<sub>1</sub>: English medium student of 8<sup>th</sup> standard do not face any difficulties in translating word problem in algebraic equations.
- 2.HO<sub>2</sub>: There is no difference between the pre-test scores and post- test scores of 8<sup>th</sup> Standard English medium student in translating word problem in algebraic equation.

## 1.7 Delimitation of the study:

- The present study is limited to only one school of Mumbai city i.e **Pal Rajendra English High School**
- The present study is focused only on the 8<sup>th</sup> B standard English medium student.
- The present study is limited to the difficulties related to translating word problem in algebraic equations.
- The study consists of only **25** students.
- This study is limited to the students of **2017-2018**.

## 1.8 Keywords

**Word Problem:** word problem is a mathematical exercise where significant background information on the problem is presented as text rather than in mathematical notation

**Algebraic Equation:** Statement of the equality of two expressions formulated by applying to a set of variables the algebraic operations, namely, addition, subtraction, multiplication, division, raising to a power, and extraction of a root

## 2. Review of related literature

The review of related literature is the most essential step when undertaking a research project. It provides a brief and critical appraisal of related studies and shows how the study contributes to the knowledge available in this particular field. It is as valuable as it helps the researcher to understand useful concept, tools, techniques and the method which they are used in the study. Related literature forms the necessary background for the research and serves as a guidance of required knowledge with which the researcher must be acquainted.

The following Literature was reviewed the researcher-

1. Title of the study -: student difficulty in translating word problem into mathematics symbol
2. Name of the researcher -: St. Paul Minnesota
3. Year -: May 2011
4. Sampling & Method -: Fourth Grade

5. Research Methodology- : Co-Operating learning

6. Tools used - : Pretest – Posttest

7. Objectives - : To identify problem face by student in translating word problems into mathematical symbol

### **Conclusion-**

Researcher conducted math language is challenging in word problem because the text is dense and concept loaded short texts are used to convey larger meaning which must be read carefully for accurate comprehension of the problem to be solved.

But after apply co-operative learning strategy and tools student improves understand of word problem and student are able to translate in mathematical symbol.

### **2<sup>nd</sup> Review**

The review of related literature is the most essential step when undertaking a research project. It provides a brief and critical appraisal of related studies and shows how the study contributes to the knowledge available in this particular field. It is as valuable as it helps the researcher to understand useful concept, tools, techniques and the method which they are used in the study. Related literature forms the necessary background for the research and serves as a guidance of required knowledge with which the researcher must be acquainted.

The following Literature was reviewed the researcher-

1. Title of the study - : Enhancing word problem solving skill of student

2. Name of the researcher- : Lenar d. L Baird

3. Year - : March 1983

4. Sampling & Method - : Seventh Grade

5. Research Methodology- : Question nearly

6. Tools used - : Paper pencil and video read life exarp

7. Objectives - : To difficulty faced by student solving word problem into eq<sup>n</sup> form

### **Conclusion**

Concluded that from this research student's ability to solve word problem depends on how they translate phrases into mathematical symbols and tool of constructive teaching and learning approaches used to enhanced the ability to identify a problem and to state

it's component and improved the ability to formulate hypotheses about the problem to eliminate various possible solutions. And after using tools and method student are able to check that the attempted solution against the problem requirements and to see the correctness of the solution.

### **3<sup>rd</sup> Review**

The review of related literature is the most essential step when undertaking a research project. It provides a brief and critical appraisal of related studies and shows how the study contributes to the knowledge available in this particular field. It is as valuable as it helps the researcher to understand useful concept, tools, techniques and the method which they are used in the study. Related literature forms the necessary background for the research and serves as a guidance of required knowledge with which the researcher must be acquainted

The following Literature was reviewed the researcher-

1. Title of the study -: Enhancing student problem solving performance and reorientations .
2. Name of the researcher -: Jonathan D. Bostic
3. Year -: August 2011
4. Sampling & Method -: Sixth Grade
5. Research Methodology -: Mean Method
6. Tools used -: Pre test and post test
7. Objectives -: Difficulties faced by student translating word problem into algebra expression.

### **Conclusion**

To translating word problem into equation form in one or two variable the mean difference showed. That the intervention tool of constructive teaching and learning approaches used to improved student's algebraic knowledge and formed algebraic expression used of real life example under the study. And after using tools and method the students are able to form algebraic expression of word problem and student developed abstract thinking for solving word problem in mathematics.

## **3. RESEARCH METHODOLOGY**

### **3.1 Meaning and types of research method:**

Once i have identified the problem area for study and specified the goals and objectives for study. I come to the core of the study which is research methodology. The methodology is the most important phase of the research process. In that it gives guidance as to how the study will be conducted.

Research method can be called as planning and execution undertaken by me to solve a specific research problem. It involves research method, purposive sampling, tools for research, data collection and data analysis method. The research problem can be past oriented, present oriented or future oriented. Thus on the basis of the conclusions, the research method are divided into three categories as given under.

- **Historical Method**
- **Descriptive Method**
- **Experimental Method**

**Historical Method:** Historical Method provides a method of investigating to discover and describe and interpret with existed in the past. Historical research attempts to establish facts so as to arrive at conclusion concerning past event.

To conduct historical research primary sources of data are commonly used. They are the eye witness account. Primary sources of data include

**Relics or remain, document such as laws, official minutes, films, recording and research report etc.**

**Descriptive method:**According to John w. Best, '*A descriptive study describe and interprets what is?*' It is concerned with conditions and relationship that exist, opinions that are held, processes that are going on, effect that are evident or trends that are developing. It is primarily considered with present, although it often considers past event and influences as they relate to current conditions. Generally survey method is used for data in this type of research study.

**Experimental Method:**The research in which effect of one factor on the other studied is called the experimental research. In scientific terms, experimental research means examining the hypothesis, indicating the cause and effect relation.

According to kerlinger(1953) "An experiments taken to make an scientific investigation in which investigator manipulates and controls one or more independent variables and observe the dependent variable or variables for variation concomitant to the manipulation of the independent variable."

It is only method of research that can truly test the hypothesis concerning the cause and effect relationship. It represents the most valid approach to the solution of educational problems both practical and theoretical and to the advancement of education as a science.

Experimental design in the blue print of the procedures that enable the researcher to test hypothesis by reaching valid conclusion about relationship between independent and dependent variables.

- **Pre – experimental design**
- **True – experimental design**
- **Quasi – experimental design**

Selection of a particular design is based on the purpose of experimental, the type of variables to be manipulated and the conditions or limiting factors under which it is conducted.

### 3.2 Selection of Research Methodology:

Experimental research method was chosen to conduct the present study. Within the experimental research design pre experimental design i.e one group pretest posttest design is used.

#### One- group pretest- posttest design

In this design the researcher administers a pretest, then the treatment and finally a posttest. The effects of treatment are judged by the difference between the pretest and posttest scores. The design is represented as follows.

$O_1 \quad X \quad O_2$

Where  $O_1$ - Pretest      X-Treatment       $O_2$ -Post test

### 3.3 Sample and Sampling Technique

#### 3.3.1 Sample..

A sample is small portion of the population that is selected for observation and analysis. The sample comprises of 25 students of std.8<sup>th</sup> from B.

#### 3.3.2 Sampling Technique:

Sampling technique is the strategy chosen for selecting samples based on logistics, ethics and paradigm of the research. Generally two types of sampling techniques are used which are as follows.

#### 1. PROBABILITY SAMPLING

- Simple random sampling
- Systematic sampling
- Stratified sampling
- Cluster sampling
- Multi stages sampling

#### 2. NON PROBABILITY SAMPLING

- Quota sampling
- Incidental sampling
- Convenience or chunk sampling
- Purposive sampling
- Judgemental sampling

Purposive sampling technique was applied to select school **Pal Rajendra English High School** and class **8<sup>th</sup> /B**. Student were chosen by using **Purposive sampling technique**

### 3.4 Data Collection

The data was collected from 25 student.

#### 3.4.1 Tools for data collection.

The researcher used self-constructed pre test and post test questionnaire. Following questionnaire (Appendix A and B ) were used for data collection.

#### 1.Pre test Questionnaire.2.Post test questionnaire

#### 3.4.2 Administration of tools:

At first permission was sought from the principal of the school to conduct the present study.

Then the class was contacted and permission was to administer the tool was taken from him/her. The researcher gave necessary instruction to the student regarding the pretest or posttest questionnaire. The data was collected from 25 students. (Appendix C)

### 3.5 Method of data analysis:

**Mean** was used to analyses the pretest and posttest scores of students.

## 4. Analysis and Interpretation of Data

Objective1: to identify the difficulties faced by 8<sup>th</sup> standard English medium students in understanding word problem and translating in algebraic equation.

HO1: English medium students of standard 8<sup>th</sup> do not face any difficulties in understanding word problem and translating in algebraic equation.

**Table4.1**

### ANALYSIS OF PRE-TEST SCORES OF THE STUDENTS

Sr NO.	Test	Total Number of the students (N)	Mean (M)
1	Pre-test	25	10.44

#### Interpretation:

Table 4.1 shows that the pre-test scores of class 8<sup>th</sup> B who faces problem in understanding word problem and translating in algebraic equation in mathematics \_\_\_\_\_. The mean score acquired by the students is \_10.44\_. The null hypotheses 1 is rejected .

2) Objective2: to provide remedial teaching for difficulties in translating word problem in algebraic equation.

**Table 4.2**

**MEAN VALUE OF THE SCORE ACQUIRED BY THE STUDENTS IN POST-TEST**

Sr No.	Test	Total Number of students (N)	Mean (M)
1	Post-Test	25	14.96

**Interpretation:**

Table 4.2 shows the post-test scores of class 8<sup>th</sup>B\_\_who faces problem in understanding word problem and translating in algebraic equation in mathematics. The mean score acquired by the students is 14.96\_\_.

Objective3 to find out the difference between the pre-test and post-test scores of 8<sup>th</sup>standard English medium students in understading word problem and translating in algebraic equation in mathematics.

Hypotheses2 there is no difference between the pre-test scores and post-test scores and post- test scores of 8<sup>th</sup>standard English medium in understanding word problem and translating in algebraic equation in mathematics.

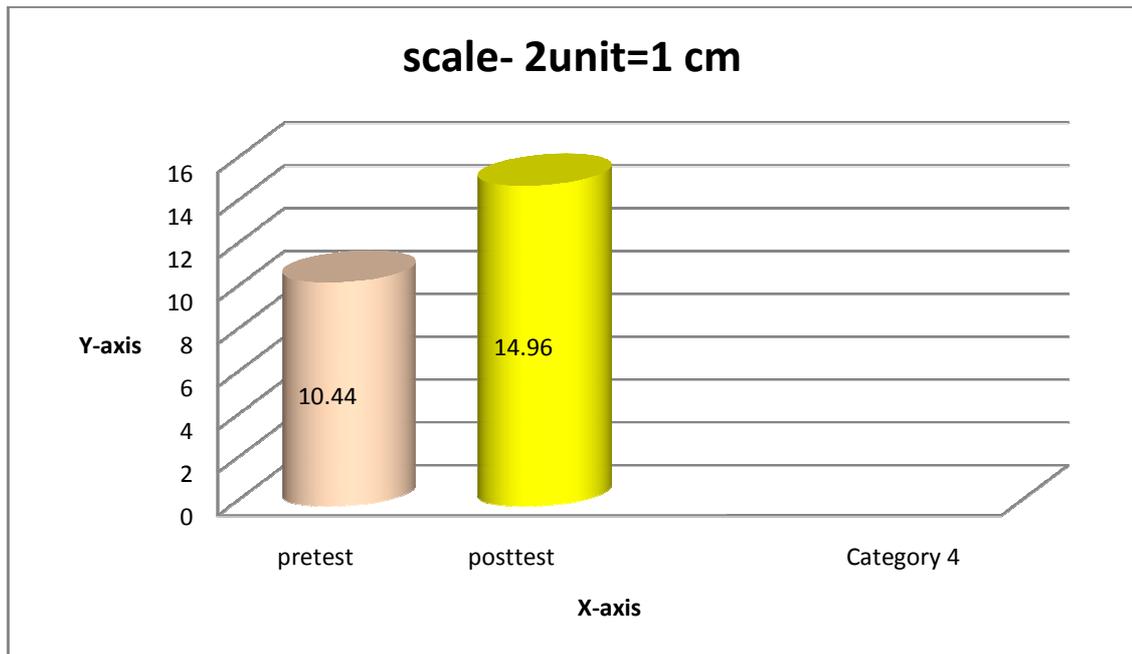
**Table 4.3**

**DIFFERENCE BETWEEN MEAN VALUE OF THE SCORES ACQUIRED BY STUDENTS IN PRE-TEST AND POST –TEST**

Sr.no	Test	Total no. of Students	Mean	Difference of Mean (M2-M1)
1	Pre –Test	25	10.44	14.96 – 10.44 =4.52
2	Post -Test	25	14.96	

**Interpretation :**

Mean of the pre-test and post-test of students is calculated in table 4.3. It is clear that mean of post-test scores (\_14.96\_)is higher than that of mean of pre-test scores (\_10.44\_).The difference in the mean is(\_4.52). The null hypotheses 3 is rejected .The graphical representation is give below.



**Figure 1**

**DIFFERENCE BETWEEN MEAN VALUE OF THE SCORES ACQUIRED BY STUDENTS IN PRE-TEST AND POST –TEST**

**Conclusion and Summary**

**5.1 Introduction**

The current action researcher on “Difficulty faced by student in understanding word problem and translating into algebraic equation”. The student when introduced about word problem translating into algebraic equation in 8<sup>th</sup>std first time faced difficulties in understanding word problem in math. Mathematics is the abstract science of number quantity and space either as abstract concept (pure mathematics) or as applied to other discipline such as physics and engineering. Mathematics makes our life orderly and prevents chaos. Certain qualities that are nurtured by mathematics are power of reasoning, creativity, abstract, critical thinking.

**5.2 Objectives**

1. To identify the difficulties faced by 8<sup>th</sup> standard English medium students in understanding word problem and translating into algebraic equation.
2. To improve the difficulties / to provide remedial measures for difficulties in 8<sup>th</sup> standard English medium students in understanding word problem and translating in algebraic equation.
3. To find out the difference between the pre- test and post – test scores of 8<sup>th</sup> standard English medium students in understanding word problem and translating in algebraic equation.

### 5.3 Hypotheses of the study

Ho1- Directional Hypothesis

Ho2- Null Hypothesis

HO1- Students of English medium 8<sup>th</sup> standard do not face any difficulties in understanding in word problem translating in algebraic equation.

HO2- there is no difference between the pre-test scores and post-test scores of 8<sup>th</sup> standard English medium students in understanding in word problem translating in algebraic equation.

### 5.4 Conclusion:

The researcher conducted this study “Difficulties faced by student in understanding word problem and translating in algebraic equation.

- 1) Table 4.1 and Graph 4.1 : Objective 1 Hypothesis 1  
Student of English medium 8<sup>th</sup> std do not face any difficulty in translating word problem in algebraic equation.
- 2) Table 4.2 and Graph 4.2 : Objective 2 Hypothesis 2  
To provide remedial measures for difficulties faced by student in understanding word problem and translating in algebraic equation among 8<sup>th</sup> std English medium students.
- 3) Table 4.3 and Graph 4.3 : Objective 3 Hypothesis 3  
There is no difference between pre- test and post test scores of 8<sup>th</sup> std students.

According to the objectives, we wanted to identify problems faced by student of 8<sup>th</sup> std in mathematics. So first I took pre- test in 8<sup>th</sup> std. The mean for pre-test score was 10.44 and 52.2%. Then I provided remedial measures by using questionnaire strategy technique. After that I took the post-test for the same students. the mean score was 14.96 and 74.8%. Hence, we concluded that student of 8<sup>th</sup> std faced difficulties in understanding word problem and translating in algebraic equation. But after provided remedial measures for improvement there was significant improvement, in performance of 8<sup>th</sup> std mathematics students and they are able to solve the word problem and translating in algebraic equation.

### 5.5 Suggestion

- 1) The school teacher/ Principal should give remedial teaching classes.
- 2) The school teacher/principal should organized mathematics club, quize, puzzle, games
- 3) The school/ principal should provide mathematics club and appropriate material to make Mathematics subject exciting to learn.
- 4) The school should arrange field trips like banking for creative learning.

### **5.5.1 General.**

#### **For students**

- 1) The students should first understand the basic concept of word problem for translating in Algebraic equation
- 2) Students should pay attention for application based type question.
- 3) Students should listen to their teacher and their difficulties in class itself as practicing For the Equation will make them better in understanding the concept.

#### **For teacher.**

- 1) The teacher should clear the concept of previous standard first then he/she should Relate the previous concept with new.
- 2) Teacher should use different methods like games, puzzle for the better Understanding of Concept of word problem.
- 3) Using different real life object in mathematics classes will help students to develop better Understanding of the word problem and translating in algebraic equation.

#### **For Parents.**

- 1) Parents should interact with teacher to check the progress of his/her child regularly.
- 2) Parents should check their children's note book and work every day.
- 3) Parents should need to co-operate with the school and teacher for wider implementation of such model and strategy.
- 4) Parents should need to appreciate new learning technique strategies used by School To help their wards achieve academic success and encourage.

#### **Suggestion for further student:**

- 1) The researcher faced some difficulties in making the students Understanding how To identify data of word problem and their translations. Specially those are Weak in mathematics.
- 2) A lot of practice needs to be given to the students.
- 3) Researcher can be also chosen samples from ICSE and CBSC board rather than Any aided school
- 4) Study can be also based on higher secondary students.
- 5) The study can be based on more or less than 25 students.
- 6) Similarly study can be taken on other subject like physics, chemistry, Biology etc.

**REFERENCES:**

1. Ramachandran, B (2017) from SNTD, Mumbai, A study of effectiveness of flipped classroom model for teaching unit from mathematics.
2. Krishnaswamy, O R, Reddy D(2012) Research Methodology and Statistical analysis ,Himalaya Publishing House, New Delhi.

**WEBSITES:**

- 1) [www.hamline.edu](http://www.hamline.edu)
- 2) [Ufdcimages.uflib.ufl.edu](http://Ufdcimages.uflib.ufl.edu).
- 3) [Watermark.silverchair.com](http://Watermark.silverchair.com)