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A STUDY OF MATHEMATICAL SKILLS OF STUDENTS AT THE UNDERGRADUATE LEVEL

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Abstract :

Mathematics is one of the subjects in our curriculum, which has the most practical uses either inside or outside the institutes. Mathematics skills have a far and wide relative importance in our daily activities and with other subjects also. As students feel difficulties with numbers and equations, for them home work is a disturbing experience. But even though mathematics isn't exactly an easy subject, there are ways in which the learning of it can be made less problematic and traumatic. Mathematical problem solving is a skill that involves a set of facts and concepts. Studies show that developing Mathematical skills helps anybody for intellectual prosperity which leads to their career and economic enhancement. This paper tries to study the Mathematical skills of K. J. Somaiya College of Arts and Commerce students.

Keywords: Mathematical skills, counting skills, conceptual skills, arithmetical skills, computational skills, logical skills, creative skills, analytical skill and memory skills.

INTRODUCTION

Mathematics is the language of the universe. It is one of the largest fields of study in the world today and considered as the main branch of science. Math is a tool for representing and investigating the nature of the real world. Mathematics is found everywhere in our walk of life. "If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is." (John Von Neumann). Memorizing math facts is the most important step to understanding math. "The formulation of the problem is often more essential than its solution, which may be merely a matter of mathematical or experimental skill." (Albert Einstein). The primary purpose of this research study is to see whether student's self-assessment is projecting their simple Mathematical skill. It was expected that the higher-order thinking process and Mathematical literacy development required for self-assessment. "Mathematics is the cheapest science. Unlike physics or chemistry, it does not require any expensive equipment. All one needs for mathematics is a pencil and paper." (George Polya – Mathematician). Mathematics is more than merely counting. Grasping and applying the basic of math is required to improve anybody's arithmetic skills. Applying mathematics in everyday situations will improve our arithmetic skills.

COUNTING SKILLS: One of the mathematical skills one needs to master to count and understand from sets of objects.

CONCEPTUAL SKILLS: Abilities which allow a person to visualize concepts, see patterns, understand abstract ideas, solve problems, formulate processes and understand how systems, programs and ideas interrelate.

ARITHMETICAL SKILLS: These skills are required for the fundamental calculations such as addition, subtraction, multiplication and division.

COMPUTATIONAL SKILLS: They are the selection and application of arithmetic operations to calculate solutions to mathematical problems. Computational Thinking is the skill of the 21st century. It required innovative and scientific thinking.

ANALYTICAL SKILLS: It is the ability to visualize, articulate, and solve both complex and uncomplicated problems and concepts and make decisions that are sensible and based on available information.

LOGICAL SKILLS: One of the fundamental parts of mathematical thinking is to be able to think logically and rationally, mainly while solving problems, by using left-part of the brain.

CREATIVE SKILLS: These skills are required for making equations, drawing geometrical shapes and graphs etc.

MEMORY SKILLS: Memory refers to the ability to store, retain and recall information, events and math procedures.

LITERATURE REVIEW:

1.Sally Jordan in her book 'Math Skills', described the role of "BODMAS" concepts in elementary arithmetic works. This book contains several problems which shows the importance mathematics skills and concepts such as percentage, ratio, proportion, unit of measurements and mensuration.
2.Miller, O'Neill and Hyde in their book 'Fundamental Mathematical Skills' covers the importance of mathematical skills in daily life and as tool for success in education. It includes arithmetic procedures and their applications in day to day activities.
3.In 'Math Computation Skills & Strategies, Level 4, Ebook', Kent Publishing, narrated mathematical skills through several simple lively problems.
4.Mr. Anjum Pasha in his book 'Speed Math- Quick and Easy Calculations' had come with simple math problems which illustrates basic math skills which require for elementary math simplifications.

OBJECTIVE OF THE STUDY:

To study and understand the basic Mathematical Skills and concepts of students at the undergraduate level.

RESEARCH METHODOLOGY:

The researcher carried out a descriptive research methodology to collect primary data through a questionnaire with a familiar 5 point Likert scale from very poor to very good. The questionnaire also contains 10 objective questions to know their fundamental concepts in Mathematics. To verify their answers about the mathematical skills, other three subjective questions are also incorporated to find Least Common Multiplier (L.C.M), Greatest Common Devisor (G.C.D) and solving simultaneous equations in two variables. A set of 100 primary data are collected randomly from K. J. Somaiya College of Arts and Commerce, Vidyavihar.

TABULATION OF DATA:

Table-I

GENDER	NUMBER OF STUDENTS
MALE	58
FEMALE	42

Table-II

COURSE	NUMBER OF STUDENTS
Humanities	37
Commerce	63

Table-III

Mathematical Skills(selected)	Very Poor	Poor	Average	Good	Very Good
Numeric skill	2	4	26	53	15
Conceptual skill	3	10	28	45	14
Arithmetical skill	7	4	18	44	32
Computational skill	5	10	35	33	17
Logical skill	2	4	37	30	27
Analysis skill	3	11	30	33	23
Memory skill	4	10	40	30	16

Table-IV

Mathematical Skills(selected)	Very Poor	Poor	Average	Good	Very Good
Numeric skill	2	4	26	53	15
Conceptual skill	3	10	28	45	14
Arithmetical skill	7	4	18	44	32
Computational skill	5	10	35	33	17
Logical skill	2	4	37	30	27
Analysis skill	3	11	30	33	23
Memory skill	4	10	40	30	16

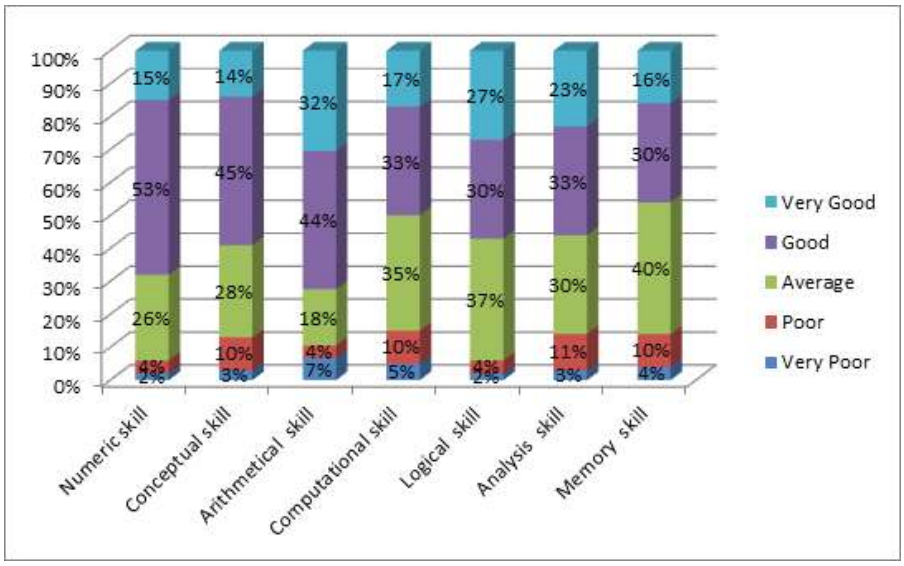
Table-V

SUBJECIVE QUESTIONS	ANSWERS		
	CORRECT	WRONG	I DON'T KNOW
L.C.M	23	20	57
G.C.D	9	5	86
Solving equations	40	29	31

FINDINGS FROM THE RESEARCH STUDY:

1 . PERCENTAGE BAR DIAGRAM REGARDING DIFFERENT MATHEMATICAL SKILLS IN STUDENTS

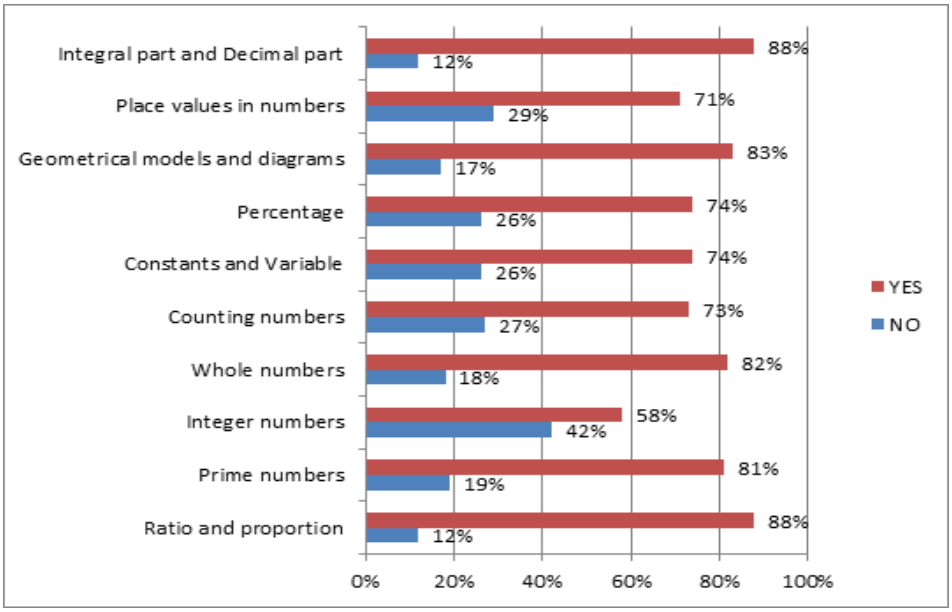
Different Math Concepts	NO	YES
Ratio and proportion	12	88
Prime numbers	19	81
Integer numbers	42	58
Whole numbers	18	82
Counting numbers	27	73
Constants and Variable	26	74
Percentage	26	74
Geometrical models and diagrams	17	83
Place values in numbers	29	71
Integral part and Decimal part	12	88



INTERPRETATION OF DATA-(1) (REFERENCE TO TABLE-III):

Result-1: About 11% students show below average Mathematical skill.
Result-2: About 33% students show average Mathematical skill.
Result-3: About 56% students show above average Mathematical skill.

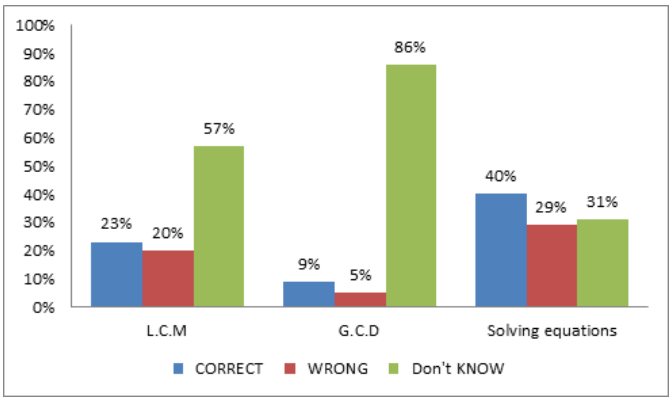
2. MULTIPLE BAR DIAGRAM REGARDING DIFFERENT MATHEMATICAL CONCEPTS IN STUDENTS



INTERPRETATION OF DATA-(2) (REFERENCE TO TABLE-V):

Result-4: On average 23% students responses are "No" to several basic Math concepts.
Result-5: About 40% students respond to "No" to the integer concept.
Result-6: About 29% students respond to "No" to the place value concept in integers.

3. MULTIPLE BAR DIAGRAM SHOWING PERCENTAGES OF RESPONSES IN THE SUBJECTIVE QUESTIONS



INTERPRETATION OF DATA-(3) (Reference to Table-IV):

Result-7: Only 23% students got the correct answer of L. C. M of numbers 3, 4 and 5
Result-8: Only 9% students got the correct answer of G.C.D of numbers 12, 30 and 66 .
Result-9: Only 40% students got the solution of the equations $2x + 3y = 13$ and $x - 3y = -7$.

CONCLUSION:

The study reveals that about 44% students have poor Mathematical conceptual skills. On an average 23% of the student's responses are "No" to several basic Mathematical concepts. The answers of the three subjective questions provide support to these comments. About 26% the students don't have the

concept of constants, variables and percentages. Approximately 20% of the students don't have the concept of counting number, whole number, integers and prime numbers, which are using very often in any of the under graduate studies. It is noticed that, they are either afraid or hesitate, even to start and solve the problem. Overall 12% students are not very much clear about the concept of integral and decimal part of a number and ratio and proportion.

SUGGESTIONS:

Studying any mathematical concept without any practical aspect is worthless. Initiating a positive attitude towards Mathematics is one of the best ways to improving anybodies Mathematical skills. Students should not show any negative approach whenever they see any arithmetic. Building up students' confidence and gaining a positive attitude towards Mathematics is very important. Teaching practical oriented Mathematics will create interest in Mathematics and can overcome math phobia gradually.

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