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AN INVESTIGATION INTO UNDERSTANDING OF MATHEMATICAL CONCEPTS AMONG B.Ed. STUDENTS

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ABSTRACT

This paper presents the results of an investigation into understanding of mathematical concepts among B.Ed students. Two hundred B.Ed. students were assessed for their understanding of mathematical concepts. The findings revealed that the B.Ed. students have adequate understanding of mathematical concepts and there was significant difference in the understanding of mathematical concepts among Male and Female B.Ed. students and there was no significant difference in the understanding of mathematical concepts of the Science and Arts B.Ed. students.

KEYWORDS

Mathematical Concepts (Arithmetic, Algebraic, Geometrical)

INTRODUCTION

India has a long history of teaching and learning mathematics dating back to the Vedic Age (1500 to 200 BC). During the period AD 200 to 400, several works on astronomy and mathematics were composed, mainly based on indigenous knowledge. Most notable of this period is the contribution of Jaina mathematicians. The Jaina texts prescribed arithmetic as one of the most essential requirements for children's first education. During the period of AD 400 to 1200, a new branch known as Ganita came into existence with three separate components namely, arithmetic, algebra and geometry. But mathematics received prominence as a separate subject only in the 12th century, as referred to in the Leelavati of Bhaskaracharya. The situation with regard to mathematics education remained unchanged after AD 1200 though there had been epochmaking discoveries. In spite of political instability during the period up to the 18th century, the native system of education maintained its traditional structure up to the advent of British.

In post-independent India, great emphasis has been placed on mathematics teaching and learning. The Education Commission (1964-66) recommended mathematics as a compulsory subject for students at school level. The commission seemed to have been influenced by international opinion at that particular time and favoured 'new mathematics', which later pervaded secondary education. That was the era of sets, and the algebra of sets.

The science of `mathematics education' is still in its infancy. in any curriculum, content and presentation of content are the two most important and inseparable components. The application of learning theories in content presentation is of very recent origin. Research evidence is inadequate to say anything definite about which method is going to be the most effective for presentation of a particular type of content. However, methodology also involves the arrangement of the content in a hierarchical manner. The entire process is composed of complex psychological principles. The com-mission points out that, 'In the teaching of mathematics emphasis should be more on the understanding of basic principles than on the mechanical teaching of mathematical computations'. Commenting on the then prevailing situation in schools, it observed that in the average school today instruction still conforms to a mechanical routine, continues to be dominated by the old besetting evil of verbalism and therefore remains as dull and uninspiring as before'.

The National Policy on Education (1986) has also considered the importance of mathematics in general education and suggests that 'mathematics should be visualized as the vehicle to train a child to think, reason, analyze and to articulate logically. Apart from being a specific subject it should be treated as concomitant to any subject involving analysis and reasoning'. In the recent past there have been tremendous developments in theories of learning and the science of teaching. Though mathematics occupies a place of importance, the re- searches in this area have been scanty.

JUSTIFICATION OF THE STUDY

It is an acknowledged truism that one cannot teach effectively unless one's knowledge extends well beyond the scope of one he is expected to teach. Thereby the teacher of mathematics should himself have love for greater insight into the subject that he strives for in his or life students. Being the pivot of instructional programme the teacher is seriously concerned with this problem. Hence efficiency of a competent mathematics teacher lies in creating interest among the students for the subject; there by enabling them learn fundamental concepts, important rules, formulas and facts as wholes and use them accurately. There are several factors that are responsible for the poor performance of the students in mathematics. But mostly the teachers are blamed for their poor performance. Some of the teachers don't have the basic understanding of concepts, so they fail to teach effectively. Thus the students also fail to grasp the spirit of the subject, the basic concepts and fundamental principles which are essential for clear understanding so, the students take it as a difficult, uninteresting, dull and dry subject. Most of the students develop a negative attitude towards Mathematics. Te students thus indulge in wrong means to get through this subject. Mass copying in examination of Mathematics leads to poor results, there by losing accuracy and logical reasoning. (The investigator wants to ascertain as to what extent the B.Ed. students of Mathematics who are supposed to teach secondary school classes were in possession of the conceptual understanding of mathematical concepts during their training course, it is assumed that they have a sound background of the basic subject upto Plus two level.

LIMITATIONS OF THE STUDY

The present study was confined to 200 B.Ed. students of science and Arts stream of G.N.D.U. Amritsar and the study was limited to understanding of Arithmetic, Algebraic and Geometrical concepts.

OBJECTIVES OF THE STUDY

The present study is completed keeping in view the following objectives:

1. To construct a tool to assess the understanding of mathematical concepts among B.Ed. students.
2. To study the general understanding of mathematical concepts among B.Ed. students.
3. To study the sex variation regarding understanding of mathematical concepts among B.Ed. students.
4. To compare the level of understanding of mathematical concepts among Science and Arts B.Ed. students.

HYPOTHESIS OF THE STUDY

In order to achieve the above objectives the following hypotheses have been framed:

1. The B.Ed. students have adequate understanding of mathematical concepts.
2. There is no variation regarding understanding of mathematical concepts among Male and Female B.Ed. students.
3. There is no difference regarding understanding of mathematical concepts among Science and Arts B.Ed. students.

METHODOLOGY

Considering the nature of the problem under investigation and the nature of the data for the study, descriptive Survey method was used for data collection.

SAMPLE

The sample consisted of 200 B.Ed. students studying in eight different colleges of Education of Science and Arts stream who have opted for Mathematics as teaching subject in B.Ed. of Guru Nanak Dev University, Amritsar was selected by Random sampling method.

TOOLS USED

The investigator used self made questionnaire for assessing the understanding of mathematical concepts. The questionnaire contained 60 multiple choice questions related to Arithmetic, Algebraic and Geometric concepts. There were four probable answers for each question and the students had to select one of them.

STATISTICAL TECHNIQUES USED

The bearing of data on objectives and hypotheses of study have been determined by employing technique of Mean, Standard Deviation and t-test.

ANALYSIS AND INTERPRETATION

Hypothesis-I "The B.Ed. students have adequate understanding of mathematical concepts."

Table 1: Showing the level of understanding of mathematical concepts.

Mathematical concepts Level	Number of B.Ed. students	Percentage
High Understanding (Total score ≥ 42)	48	24%
Average Understanding (Total score between 30-40)	107	53.5%
Low Understanding (Total score ≤ 30)	45	22.5%

53.5% of the sample have average understanding of mathematical concepts, 24% of the sample have high understanding of mathematical concepts and only 22.5% of the sample have low understanding of mathematical concepts, therefore the hypothesis "The B.Ed. students have adequate understanding of mathematical concepts" stands accepted.

Table 2: Showing significant difference between understanding of Arithmetic andAlgebraic concepts.

Concepts	N	Mean	S.D	t-value	Level of significance
Arithmetic	200	12.52	3.06	1.19	Insignificant at 0.05 level
Algebraic	200	12.9	3.3		

Table 2 shows that the calculated t-value is 1.19, which is less than corresponding table value at 0.05 level of significance. From this we infer that there is no significant difference in the understanding of Arithmetic and Algebraic concepts among B.Ed. students.

Table 3: Showing significant difference between understanding of Algebraic and Geometric concepts.

Concepts	N	Mean	S.D	t-value	Level of significance
Algebraic	200	12.9	3.3	3.7	Significant at 0.01 level
Geometric	200	11.61	3.67		

Table 3 shows that the calculated t-value is 3.7, which is more than corresponding table value at 0.01 level of significance. From this we infer that there is significant difference in the understanding of Algebraic and Geometric concepts among B.Ed. students.

Table 4: Showing significant difference between understanding of Arithmetic and Geometric concepts.

Concepts	N	Mean	S.D	t-value	Level of significance

Arithmetic	200	12.52	3.06	2.68	Significant at 0.01 level
Geometric	200	11.61	3.67		

Table 4 shows that the calculated t-value is 2.68, which is more than corresponding table value at 0.01 level of significance. From this we infer that there is significant difference in the understanding of Arithmetic and Geometric concepts among B.Ed. students.

Hypothesis-II "There is no variation regarding understanding of mathematical concepts among Male and Female B.Ed. students."

Table 5: Showing significant difference between understanding of mathematical concepts of Male and Female B.Ed. students.

Concepts	N	Mean	S.D	t-value	Level of significance
Male	100	37.83	6.77	2.80	Significant at 0.01 level
Female	100	35.07	7.16		

Table 5 shows that the calculated t-value is 2.80, which is more than corresponding table value at 0.01 level of significance. From this we infer that there is significant difference in the understanding of mathematical concepts of Male and Female B.Ed. students.

Hypothesis-III "There is no difference in understanding of mathematical concepts among Science and Arts B.Ed. students."

Table 6:Showing significant difference between understanding of mathematical concepts of Science and Arts B.Ed. students.

Concepts	N	Mean	S.D	t-value	Level of significance
Science	100	37.08	7.34	1.26	Insignificant at 0.05 level
Arts	100	35.82	6.81		

Table 6 shows that the calculated t-value is 1.26, which is less than corresponding table value at 0.05 level of significance. From this we infer that there is no significant difference in the understanding of mathematical concepts among Science and Arts B.Ed. students.

CONCLUSION

The purpose of the present study was to investigate the understanding of mathematical concepts among B.Ed. students and the study indicated significant relationship among the variables. The study may find some usefulness in the field of mathematics education and the findings of this study may serve as a database for further research.

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