



A STUDY TO EVALUATE THE EFFECTIVENESS OF ABACUS TRAINING ON MATHEMATICS LEARNING AMONG SCHOOL CHILDREN AT AN ABACUS TRAINING INSTITUTE IN GUWAHATI, ASSAM

Physiology

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ABSTRACT

Background: The Abacus is a simple tool with vertical rods on which beads move up and down on a frame designed for performing rapid arithmetic calculation. It was invented by Charles Babbage. With movement of fingers over the beads and talking aloud while solving the mathematical problems, there is coordination of visual, auditory and motor skills. Abacus learning involves both the hemispheres of brain and highly effective in improving the concentration level of children. The aim of the present study is to evaluate the effectiveness of Abacus training on mathematics learning among school children at an Abacus training institute in Guwahati City. **Methodology:** A total of 110 healthy children aged between 5 to 12 years enrolled for Abacus training were selected for the study. The marks obtained in SIM-1 before joining the Abacus training were used as pre-test scores, while marks obtained in SIM-2 after completing the 4th level (16 months) of Abacus training were used as post-test scores. Readings were analyzed for statistical significance. **Results:** Out of 110 students, 65 students (59%) obtained scores more than 40 in SIM-2 as compared to SIM-1. Thus, there was a significant improvement in the post-test scores as compared to pre- test scores (P value of <0.05). **Conclusion:** In the present study, it was seen that Abacus training shows a significant improvement in mathematical calculation skill of school children in terms of speed and precision.

KEYWORDS

Abacus, SIM-1, SIM -2, pre test scores, post test score

INTRODUCTION

Abacus is a kind of traditional calculator that has been used in China, Korea, Japan and India for rapid precise arithmetic calculation.¹ Abacus contains vertical rods on which beads move up and down on a frame. Abacus training can improve cognitive skills.⁸ With movement of fingers over the beads and talking aloud while solving the mathematical problems, there is coordination of visual, auditory, and motor skills. This in turn induces increase in synaptic connection⁴. Abacus learning involves both the hemispheres of brain⁷ and highly effective in improving the concentration level of children. After long term Abacus training one can imagine an Abacus in mind and can perform arithmetic calculation rapidly and precisely⁹. The present study was done with the aim to evaluate the effectiveness of Abacus training on mathematics learning among school children at an Abacus training institute in Guwahati city.

METHODS

A total of 110 healthy children aged between 5 to 12 years enrolled for Abacus training were selected for the study. The marks obtained in SIM-1 before joining the Abacus training were used as pre-test scores, while marks obtained in SIM-2 after completing the 4th level (16 months) of Abacus training were used as post-test scores. Readings were analysed for statistical significance.

Inclusion Criteria:

- Children between age group 5 to 12 years.
- Students enrolled for 4th level (16 months) level Abacus training.
- Willingness to participate in the study.
- Students with above moderate IQ.

Exclusion Criteria:

- Children of non-graduate parents.
- Students not willing to participate.

RESULTS

In the present study mean and the standard deviation was taken, and P-value was estimated using paired t-test and value of <0.05 was taken as significant. Out of 110 students, 65 students (59%) obtained scores of mean 46.93 with a standard deviation of 16.70 in SIM-2 as compared to SIM-1 where the mean scores were 4.96±4.62. Thus there was a significant improvement in the post-test scores as compared to pre- test scores (P value of <0.05).

Table 1 Showing Scores Obtained In Pretest (SIM-I) And Post-test (SIM-II)

Score	Marks (Mean±std)	p-value
Pre-test (SIM-I)	4.96±4.62	0.01*
Post- test (SIM- II)	46.93±16.70	

*p-value<0.05 is significant

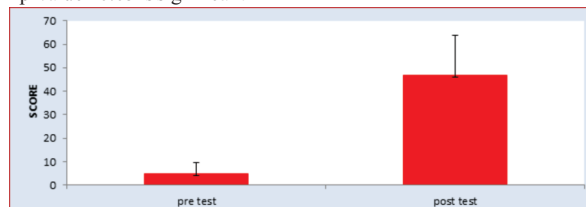


Figure 1 Showing Mean Scores And Its Standard Deviation Obtained In Pretest (SIM-I) And Post-test (SIM-II)

DISCUSSION

The primary purpose of our study was to evaluate the effectiveness of abacus training on mathematics learning by the students. The study showed that abacus learning had helped the students to improve the skill of mathematical calculation significantly.^{2,5,10} There was also an increase in speed of calculation. Learning mathematics by using Abacus has several effects on learning ability of children particularly when it is practiced regularly. Recent studies have proved that abacus method of mental calculation is extremely effective in activating the right brain.³ Not only it enhances concentration and but also improves numerical memory. Because, students practicing abacus place the numbers on the abacus image in their heads as they mentally calculate with the abacus method.⁶ Abacus helps the students to make learning interesting, full of fun & lively.

CONCLUSION

In our study, it was seen that Abacus training shows a significant improvement in mathematical calculation skill of school children in terms of speed and precision.

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