The Effects of Abacus Training on Right Brain Development

According to the theory of left-brain or right-brain dominance, each side of the brain controls different types of thinking. A person who is "left-brained" is often said to be more logical, analytical and objective, while a person who is "right-brained" is said to be more intuitive, thoughtful and subjective.

The right brain-left brain theory grew out of the work of Roger W. Sperry, who was awarded the Nobel Prize in 1981.

More recent research has shown that abilities in subjects such as math are actually strongest when both halves of the brain work together.

At KIDS A+, we teach children how to train both left and right hemispheres of their brain to rapidly solve arithmetic problems.

Benbow reported that “mathematically-gifted” children (i.e., scoring at least 700 on the math portion of the S.A.T. before age 13) possessed a certain collection of attributes - suggestive of enhanced right brain development. He found that heightened development of the right brain enhanced the child’s predictors of superior mathematical reasoning ability (Benbow, 1988). Further studies demonstrated the right brain of the mathematically-gifted child is unusually engaged and relied upon during information processing.

Current research on left and right brain activity has consistently shown that differences are related to individual cognitive abilities. For example, there is growing evidence that children with a mathematically-gifted brain may process information differently than children of average math ability. Specifically, development of the right brain - together with rapid and coordinated exchange of information between the left and right brain, may be unique characteristics of the mathematically-gifted brain (O’Boyle et al., 2002).

Recent studies have shown that children learning the abacus method of mental calculation are effective in the development of the right brain with a “ripple effect” on other disciplines.
Title: EVALUATION OF MEMORY IN ABACUS LEARNERS
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Abstract: Abacus is a method used by Chinese, Japanese and Koreans to improve mathematical skills.

The improvement in mathematical skills is said to be due to a coordinated functioning of both right and left hemisphere. As learning and memory in any field is achieved by coordinating and analyzing the different sensory inputs, whether an abacus trainee would also improve the short term memory as a whole was evaluated in our study.

50 children of average IQ between 5 and 12 years from 2 regular schools and 50 from an abacus institute were evaluated for short term memory before and after a period of one and two years. The memory tests were taken from Wechsler memory scale, Mini mental state examination, Mann-Buitar visual memory screen for objects.

The results showed that the abacus learners at the end of one and two years had a better visual and auditory memory when compared to non-abacus learners.

Conclusion

Our study conducted over a period of two years show that the abacus trainees had a better visual and auditory memory when compared to non-abacus learners. We therefore believe that a student of abacus will perform better in his environment or in his study of subjects other than mathematics which requires concentration of auditory and visual inputs.
Title: Effects of abacus learning on 3rd-graders' performance in paper-and-pencil tests of calculation.
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Source: Japanese Psychological Research; ISSN:0021-5368; VOL.31; NO.4; PAGE.161-168; (1989)

Abstract: This study was aimed at investigating effects of after-school abacus learning on paper-and-pencil calculation.

Two speeded tests of basic calculation, “power tests” of multi-digit addition, subtraction, open sentence problems and word problems involving addition and subtraction, and comprehension of the “trade” principle between columns were given to 110 3rd-graders, 53 of whom were learning abacus outside the school.

The abacus learners (a) were much quicker in basic calculation, (b) made more correct responses in multi-digit subtraction, and (c) more often wrote a mathematical expression and identified the missing number correctly. All these differences remained significant even when school grade in language entered analyses as a covariate. However, when the speed of basic calculation was partialled out, differences in other tests became insignificant. No difference was observed in comprehension of the trade principle. Abacus learning seemed to have influenced paper-and-pencil calculation not through conceptual understanding, but through proficiency in shared component skills.

“The present study, using a quasi-experimental design, revealed that abacus learning did improve performance on paper- and-pencil Multi-digit subtraction under a lenient time limit, and the effect extended to the Open sentence and Writing expression problems. In other words, the effects of abacus learning upon paper-and-pencil calculation were fairly far-reaching and substantial. The extent of transfer could have been even greater if abacus learners had had a longer period of practice than seven months.”