
Theme- Role of Abacus learning in Mathematics

Dr. Manju Gera* & Jasjit Kaur**

*Assistant Professor, Department of Education, University School of Open Learning, Punjab University,
Chandigarh

**Research Scholar, Punjab University, Chandigarh

ABSTRACT:

Abacus is an external agent extensively practiced to teach learn mathematics for children. Studies have shown that abacus not only increases the ability of children in performing mathematics calculation, but also develops memory consistently (Bhaskaran , Sengothiyan , Madhu, Ranganathan 2006). With the help of abacus simple arithmetical functions are easy to learn especially multiplication which may seem easier to an adult to perform but are very difficult for the juvenile to understand (www.abacuslessons.com). This process is easy to adapt for the beginners and puts less stress on the mind of children(www.abacuslessons.com). Abacus training has become increasingly popular in India of late and helps the young minds understand the great number plan on which the universe is being run. The abacus calculation methods help us in learning in number manipulation skills, decimal grasp and digit correlation among other skills(www.maths-n-abacus.co.in)

INTRODUCTION

Abacus is an ancient calculating device used primarily in Asian culture for performing arithmetic processes. Abacus device consists of a wooden or plastic frame with beads sliding on wires. (Heffelfinger and Gary 2004). The word abacus dates before 1387 A.D .in Greek “*abax*” or “*abacon*” means table or tablet. In India, first century sources *abidharmakosa* describes the knowledge and the use of abacus by Indian clerks. Even today abacus is used by shopkeepers, merchants in Asia and china town in North America presently taught in Asia including India in preschool and elementary schools as an aid in teaching arithmetic (Takashi, www.alcula.com).

Memory is an act of an immense process of physiological activities at every act of memorization or information processing approach The information processing approach

divides memory into three general stages Sensory Memory, Short Term Memory, and Long Term Memory (Baddeley,2011).

Today in India, using abacus is an external agent extensively practiced to teach learn mathematics for children. Studies have shown that abacus not only increases the ability of children in performing mathematics calculation, but also develops memory consistently (Bhaskaran , Sengothiyan , Madhu, Ranganahantan 2006).

CALCULATIONS THROUGH ABACUS

To calculate by using Abacus, two fingers, the index finger and thumb are used. Index finger is used to move the four units beads up and down and the thumb is used to move one-unit bead up. For instance-to place the figure 7 on the Abacus, index finger needs two successive motions, first to move down a 5 unit bead and then to move up 2-one unit bead, the movements are performed simultaneously with two fingers. The movements are practiced many times until two fingers are moved nimbly & effortlessly. Beads above the horizontal bar are called Heaven beads and below the bar are called Earth beads (Takashi, www.alcula.com). With this kind of activity, once practiced, Abacus users can calculate simple mathematical problems rapidly and accurately. Further the users also acquire ability of doing mental calculation utilizing mere the Abacus image, which allows quick calculation without actually using the Abacus (Cole 2007). In the abacus method of mental calculation, the learners manipulate Abacus beads in their head to carry out calculation. To do all these proper finger technique is basic in achieving proficiency on the Abacus which becomes the skill(Millers and Stigler,1991). According to Bhaskaran, Abacus helps to visualize and manage calculations with large numbers children use both hands to move the beads for small and large arithmetic calculation. The quick communication between the hands and brain stimulation promotes quick, balanced and whole brain development. Abacus trainee had better visual and auditory memory when compared to non-abacus learners (Bhaskaran , Sengothiyan , Madhu, Ranganahantan 2006).

According to Irwing increase in general intelligence after abacus training for about 34 weeks in Sudanese school children using standard progressive matrices (Irwing,Hamza, Kaleefa, Lynn 2008)

According to ShioLee, effects of skill training, children with mental Abacus and music training compared to their controls showed better performance in all span tests this resulted that domain specific effects of skill training on working memory was better (Lee, Yuh-shivow, Minju 2007).

NEED OF ABACUS

There may arise a question in one's mind that why is there a need to teach children to use abacus or to teach them solving arithmetical problems using abacus in this time of advanced technology. But the fact is that even if the advancements are made in the technology making it possible for human beings to perform complex calculations and to explore new dimensions in the field of knowledge, the mind of the child is completely empty and it is to be written on. Child's mind could grab some things with difficulty and has the tendency of forgetting learnt topics after some time (www.abacuslessons.com).

With the help of abacus simple arithmetical functions are easy to learn especially multiplication which may seem easier to an adult to perform but are very difficult for the juvenile to understand (www.abacuslessons.com). Sometimes it is needed to teach children how to use abacus. For instance blind children are taught to use abacus because they cannot perform calculations on the paper. Abacus has proved out to be an ideal tool for those people as it allows them to calculate easily and quickly while being reliable. The use of abacus is easy to understand for the new beginner and it also helps in developing the mind of the children(www.abacuslessons.com).

At the initial learning stage of a child it is almost impossible to learn all of the things in a flash. Abacus has this innate tendency to design the model for the good development of a child's brain. The study has shown that the children which have used abacus in their past could perform arithmetical calculations more quickly and comfortably when they are grown ups. This is due to the fact that they have the golden rule of calculating long figures with the help of broken packets of that figure in their minds and it allows them to perform more conveniently in the later stage of their life (www.abacuslessons.com)

LEARN WHILE PLAYING

Nowadays abaci are also used as toys by children. These are among the things that they see quite often and are familiar with them. When children are asked to learn arithmetical calculation on their abaci they feel like playing and in this way they learn a lot without being bored at all. Children feel happy with something like abacus because of its shape. Anything, which has rods and beads attached to it, makes them feel good and relaxing while learning (www.abacuslessons.com).

This process is easy to adapt for the beginners and puts less stress on the mind of children. Every bead of the abacus is assigned a particular value and it is relatively easy to learn those values and keep performing calculations on the device, as the beads are assigned certain values therefore there is no need to keep anything in mind rather keep fingers on the beads and place beads in their calculated positions. The result can be easily inferred from the positions of the beads on the rod(www.abacuslessons.com).

IMPORTANCE OF ABACUS FOR MATHEMATICAL DEVELOPMENT **WWW.MATHS-N-ABACUS.CO.IN**

The abacus was invented by Charles Babbage though it's now being used by the entire world to turn on the mental abilities of young brains. Abacus training sharpens our memory and increases our ability to perform mental calculations. Abacus was designed in such a manner so that the brain visualizes the abacus while performing calculations which automatically activates the right part of our brain especially when we move our fingers over the beads and talk aloud while solving the problems. However, one needs to enjoy the abacus education training process, only then will one be able to truly benefit from the technique. The energy and abilities of our mind are not limited – it is the master organ which takes all the decisions of the body. The left brain is also known as the digital brain whereas the right brain helps in creative pursuits. Both sides of our brain need to work in sync with each other and that is where abacus training helps us. Abacus training has become increasingly popular in India of late and helps the young minds understand the great number plan on which the universe is being run. The abacus calculation methods help in learning in number manipulation skills, decimal grasp and digit correlation among other skills. While electronic calculators need

numbers as inputs, in abacus education, children learn to convert the beads into numbers and thus arrive at a result. The chain just goes on, the abacus sharpens the brains and the brain thus gains more expertise in solving mathematics problems using abacus. Even the most brilliant students find the use of abacus a great help while solving problems. The students can use the abacus training to calculate arithmetical problems rapidly. Later on, the students can also perform the calculations without using the abacus, by just visualizing the abacus in their minds. Abacus education also helps them develop new and innovative methods of mastering arithmetic, rather than being dependent on just the orthodox methods of learning calculations otherwise taught by the conventional education system. Abacus answers the primary need of the students to make fast and accurate calculations.

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