

LETTER TO EDITOR

Dear Editor,

Sub: Review of article entitled 'Effect of Abacus training on numerical ability of students with hearing loss' by A. K. Jadhav and Varsha Shriram Gathoo, in Disability, CBR & Inclusive Development Journal

The above article has been systematically written and work carried out is methodical. The paper is sufficiently detailed with clear objectives. The readability of paper is high. The theme of work is of high relevance. However, the reviewer has the following to point out in various headings.

1. **Sample:** The authors should specify how many total students with hearing loss were available in the 'randomly selected schools'. Secondly, on what basis were these selected 90 students finalized to be included in the sample? Thirdly, the distribution of male and female students is quite unequal in experimental groups, no reason has been cited for this inequality. Also, the distribution of sample is highly unequal in experimental and control groups (35 versus 55). If the subjects were available, then why are groups unequal in size? Fifthly, the level of hearing loss has not been specified in the sample subjects. It is possible subjects with different level of hearing loss would benefit from different pedagogy or differently from same pedagogy.
2. **Hypotheses:** In abstract, there is a mention of objectives and six null hypotheses. Reviewer could not find them anywhere in the text of the paper.
3. **Statistical analysis:** Authors mention that equal variances was assumed for t-test. Why was it not tested and just assumed? More specifically, when sample distribution is unequal? It has been mentioned (page 60, second last line), that the " pre-existing superior abilities of the boys on word problems may have been enhanced due to.....". If it was so, then ANCOVA should have been used. The values of standard deviation in two compared groups are seen to be fairly uneven (table 4). In that case, assumption of equal variances was not valid to make to start with.
4. **Parsimony:** Consider Table 5. Caption of table can just read 'Overall gain in numerical ability w.r.t gender'; 'In the Experimental group' can be deleted, since Group EG is mentioned in table. Strangely, mention of CG and details is not there. Critical value is repeated three times in table 4 and table 5. One

single mention of this value at bottom of table would suffice. Thirdly, word significant is repeated three times, it can just be indicated by putting an asterisk on significant values. This applies to table 4 and 5 both. Column of retained/ rejected is redundant.

5. **Language:** Consider first page, first paragraph of introduction, second last line. It is not language which is key barrier to success but deficiency in language which is a key barrier.
6. **Role of kinesthesia in learning of mathematics:** Consider page 68, second paragraph, third last line which reads “since no kinesthetic sense is used, students may not be able to apply their knowledge, when it comes to word problems.” Reviewer has the following points to make
 - It is assumed that sample subjects can see since only their hearing loss is mentioned. When one sees while working, vision dominates (Posner, Nissen and Klein, 1976; Smyth 1978) so much that it is difficult to focus on modality of kinesthesia. It hinders the use of feedback mechanisms (e.g. kinesthesia) emanating during learning.
 - Secondly, is kinesthesia facilitatory for learning or retention of learnt word problems? It may help in spelling or recognition of digits and alphabets or basic addition but not in word problems where cognition and central processing is required. Kinesthesia is related to memory of movements, it more relates to sense of position and movement of body (Edwards, 2011; Stelmach, 2014).
 - Reviewer is of the view that learning of word problems would require central processing capacity. Kinesthesia is feedback oriented (Bansal, 1984; Wikipedia, 2022). There is compelling evidence (Laszlo, 1966) which is still quoted today (Stelmach, 2014) that central programming mechanisms operate independently of peripheral feedback.
 - Kinesthesia may benefit persons who need assistance in activities of daily living (ADL), who need somatic feedback to reduce the physical effort required to move (Wikipedia, 2022)
7. **Reference work:** Works of Gregory, Pagliaro, Bellonio and Shwalb cited in other journals may bear the years for the benefit of consumer to know the recency of works. Secondly, on page 62, second paragraph, various authors’ first names are given in the text, the practice is to give only surnames. Thirdly,

references of Froeble, Montessori, Piaget, Dienes and Bruner found in text are missing from list of references given in the end.

8. References:

- Bansal, R.K. (1984). Role of vision and Kinethesis in short term recall of movements. Unpublished Ph.D. dissertation, Department of Humanities and Social Sciences, Indian Institute of Technology, Powai, Mumbai, India.
- Edwards, W.H. (2011). Motor learning and Control: From Theory to Practice (76-78). Belmont, CA: Wadsworth Cengage Learning.
- Laszlo, J.I. (1966). The performance of a simple motor task with kinesthetic sense loss. *Quarterly journal of experimental Psychology*, 18, part 1, pp 1-8. <https://doi.org/10.1080/14640746608400001>
- Posner, M.I., Nissen, M.J. and Klein, R.M. (1976). Visual Dominance: An information processing account of its origins and significance. *Psychological Review*, 83,2, pp 157-171. <https://doi.org/10.1037/0033-295X.83.2.157>
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- Stelmach, G.E. (2014). *Motor Control: Issues and Trends*. US: Academic Press.
- Wikipedia : <https://en.wikipedia.org/wiki/Kinaesthetics> retrieved on September 7th, 2022

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