

Learning Letters with the Whole Body: Visuomotor Versus Visual Teaching in Kindergarten

eTale 2022



The present study assessed the impact of a teacher-implemented visuomotor intervention programme of teaching cursive letter knowledge to children aged 5 years. While there was greater improvement in letter recognition following the visuomotor intervention, results were mixed for letter handwriting.

Authors: Florence Bara & Nathalie Bonneton-Botté

Source: Bara, F. & Bonneton-Botté, N. (2018). Learning letters with the whole body: Visuomotor versus visual teaching in kindergarten. *Perceptual and Motor Skills*, 125(1), 190-207. Doi: 10.1177/0031512517742284

The present study assessed the impact of a teacher-implemented visuomotor intervention programme for teaching cursive letter knowledge to children aged 5 years. A programme in which letters were explored with the arm and whole body was compared with a typical visual training programme. There was greater improvement in letter recognition following the visuomotor intervention although results were mixed for letter handwriting. This indicates a combination of both visuomotor and visual training might be the most efficient method.

- Letter knowledge acquisition is an important component of a child's literacy development and is one of the strongest predictors of subsequent reading and spelling abilities.
- When learning involves both perceptual and motor systems, there is an interaction between perception and action.
- Visual representations of letters are linked to motor representations through handwriting.
- Related to perception and the motor interaction process, some studies with young children have shown that overt (rather than just passive) motor action further enhances letter perception.
- Formal pencil-and-paper writing depends upon an accurate visual representation of the letters, a degree of coordination between visual perception and finger movements, and sufficiently developed fine motor skills.
- Impaired handwriting is frequently associated with developmental coordination disorder. In particular, it has been closely linked to fine motor manipulative disability and to coordination problems.
- An efficient letter knowledge intervention must include both handwriting practice and direct instruction in letter knowledge.

What are the subskills of letter knowledge?

- Letter recognition: the ability to recognise the shape of the letter
- Letter naming: associating the shape of the letter to its name
- Letter sound knowledge: finding the sound corresponding to the shape or name of the letter
- Letter writing: the ability to trace the letter with a pen in accordance with its shape and direction



The study

This study investigated a novel kindergarten-level multisensory teaching intervention for letter knowledge, whereby alphabet letters are taught through gross motor movements—pupils are asked to produce letters with their arms or whole body and without using a pencil. As gross motor development occurs earlier than fine motor development, gross motor movements should be particularly helpful for young children or those with disabilities.

Hypotheses:

- A whole-body visuomotor training programme would be more efficient than a visual letter exploration programme.
- An improvement in hand-writing quality and fluency can be expected.

Participants

The study involved 72 normally-developing kindergarten pupils (aged 5 years) living in France, who were assigned to either the whole-body visuomotor or visual exploration training programme.

Interventions

- The pupils were divided into groups of 6–10 and underwent a 45 min session in which two letters were successively learned.
- All children completed six sessions over six weeks.
- The 12 letters used for training sessions and their order of presentation were chosen according to their frequency in the French language and because they represented different types of letters.

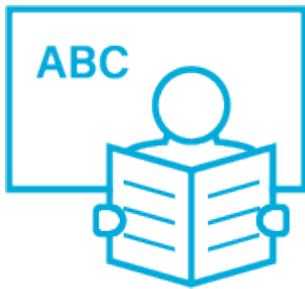
- Each visuomotor and visual training session started by giving the name and the sound of the letter and ended with letter-recognition and letter-handwriting tasks.
- **The visual training sessions** included visual exploration, where a letter was displayed on the board and pupils were asked to draw the letter with their eyes.
- **Whole body visuomotor training sessions** included exploration with the arm (where the teacher drew the letter in the air with their arm and pupils were required to repeat this action) and exploration with the body (where the letter was drawn on the ground and each pupil walked round the outline). These exercises initially conducted with eyes open, then with eyes shut.



Findings

- The students improved their letter recognition score more with the whole body visuomotor training programme than with the visual programme.
- The training groups did not differ in their progress in letter-name knowledge or letter writing under dictation (both improved between the pre- and post-tests in both training programs).
- Mean quality scores and stroke direction (handwriting direction) in letter copying improved more after the visuomotor training programme.
- Mean number of pauses and mean duration of pauses decreased and mean velocity increased between the pre- and post-tests in both training programs; thus, there were no group differences.
- Pupil handwriting fluency improved more in the visual

training programme than in the visuomotor training programme.



Summary

- The main finding was that letter recognition improved more following the visuomotor training programme than with the visual training programme. This implies a strong relationship between the visual and the motor systems in reading and writing processes.
- Regarding the kinematic measures, the visuomotor training programme only had a positive effect on stroke direction. It is interesting to note that a gross motor movement can transfer to a fine motor movement with the hand.
- An unexpected result was that handwriting fluency improved more following the visual training programme than with the visuomotor training programme.
- The present study provides support for a gross-motor visuomotor intervention to promote such specific components of letter learning as improving letter recognition and improving two aspects of letter writing (stroke direction and overall quality). It should be noted that handwriting speed and fluency improved more with a visual instructional method.
- A question emerges as to whether the combined use of visuomotor training and visual letter exploration might prove to be a more effective teaching method than either technique used alone.