

## LETTER TO EDITOR

---

Dear Editor,

### **Adapted Science Experimental Aids for Students with Visual Impairment**

It has been proved that science subjects can be taught to students with visual impairment. According to Mani (1992), science education is meant to help students understand the natural world in which they live and to recognise the importance of scientific developments. It also helps students with visual impairment to understand concepts and to develop social interactions with sighted students (Wild and Koehler, 2012).

Students with visual impairment learn science concepts by using their auditory, kinesthetic and olfactory senses, with appropriate modification and adaptation. Adapted teaching aids involve special approaches and presentation styles to provide them optimal learning experience in the regular classroom. The necessary changes are made through processes such as duplication, modification, substitution and omission without changing the instructional objectives. While students with visual impairment can understand theory, difficulties arise with experiments; however, they are able to understand experimental concepts clearly when adapted experimental aids are used. To illustrate this, the author carried out a study using 12 scientific experiments with experimental aids with 30 students with visual impairment (13 girls and 17 boys) studying in classes 7 to 9 from Coimbatore and Nilgiri Districts of Tamil Nadu state in India.

Table 1 shows experiments and adaptations used.

**Table 1: Experiments and Mode of Adaptation Used**

Subject	Name of the Experiment	Mode of Adaptation Used
Physics	Pressure	Kinesthetic
	Archimedes' principle	Kinesthetic
	Electric circuit	Auditory
	Expansion of gases	Kinesthetic
Chemistry	Oxygen is required for burning	Kinesthetic
	Elements and compounds	Kinesthetic
	Physical status of matters	Kinesthetic
	Chemical equation and structure	Tactile

Biology	Human respiratory system	Kinesthetic
	Osmosis	Kinesthetic
	Human excretory system	Kinesthetic
	Human digestive system	Kinesthetic

There was a significant difference between the pre- and post- test scores in the performance of experiments with adapted experimental aids by the students, showing that the adapted experimental aids enhanced and developed their learning skills and understanding of concepts. This is supported by the research of Chevins and Nacer (2007), in which a year's experience in preparing and delivering teaching materials specially designed for students with visual impairment, including blind students, had shown that these students were capable of achieving many of the learning outcomes expected of sighted students. Studies conducted by Doin et al (2000) and Bulbul (2013) also support these findings.

It can be concluded that the use of adapted aids for students with visual impairments will enable them to perform science experiments and to understand the concepts without getting confused. This demonstrates the importance of adapting experimental aids according to the specific needs of these students. It will lead to the development of self-confidence and independence among students with visual impairment.

## REFERENCES

- Bulbul MS (2013). A description of a blind student's science process skills through health physics. *European Journal of Physics Education*; 4(2): 6 – 13.
- Chevins P, Nacer A (2007). Teaching biological science to blind students. *The Science Learning and Teaching Conference*, 2007.
- Doin M, Hoffman K, Matter A (2000). Teachers' manual for adapting science experiments for blind and visually impaired students. <http://www.trinity.edu/org/sensoryimpairments/VI/TA/VI%20-%20Final%20Ch%205%20Activities%20-%20Science.pdf>.
- Mani MNG (1992). *Techniques of teaching blind children*. New Delhi: Sterling Publishers Private Limited.
- Wild T, Koehler K (2012). Teaching science to students with visual impairment. <http://www.deficienciavisual.pt/txt-teachingscience.htm>

J B Dheesha\*

\*Corresponding Author: Assistant Professor, Department of Visual Impairment, Faculty of Disability Management and Special Education, Ramakrishna Mission Vivekananda University, Coimbatore, Tamil Nadu, India. Email:dheeshabojan@gmail.com