

# THE EFFECT OF A READING EFFICIENCY PROGRAM ON VISUALLY IMPAIRED TERTIARY STUDENTS—A PILOT STUDY

KERRY FITZMAURICE HDTs, DipAppSc(Linc), DOBA

JOHN J. KEAST Churchill Fellow  
Melbourne

---

## Abstract

*The aim of the pilot study was to determine if reading and vision training could improve the reading efficiency of a visually impaired person. Vision training included eccentric viewing techniques and maintenance of the eyes at null point where appropriate. Training was given in the use of lighting, reading boards and low vision aids. Exercises were given to increase the field of fixation and improve concentration. The program was found to be of benefit to the students who participated.*

**Key words:** Vision training, eccentric viewing, null point.

---

Visual training programs to help people with visual impairment to maximize the use of their residual vision have been found to be successful both within Australia and overseas. Fridal, Jansen and Klindt<sup>1</sup> cite the case of partially sighted students with reasonable vision experiencing reading difficulties. A course to develop reading efficiency was shown to help these students. Moore<sup>2</sup> notes that visual efficiency may be learned and may be of significant value in enabling patients to get the optimum benefit from low vision aids. Inde<sup>3</sup> notes that once programs were introduced into Sweden, their success in rehabilitation of partially sighted persons is indicated by their expansion into the major hospitals of every country.

One form of visual efficiency training is the use of an eccentric fixation point in the presence

of a central scotoma. Goodrich and Quillman<sup>4</sup> outline a variety of such techniques. The therapist must know the patient's visual acuity and visual field to attempt to enforce an eccentric point as close to the fovea as possible. Further methods of eccentric viewing training have been described by Lederer and Wulff<sup>5</sup> and Wellington.<sup>6</sup> In all cases the need to begin with easy tasks to help master the technique is emphasised. Only when the patient is in control of one task should the difficulty be increased and much verbal encouragement is necessary.

Visual efficiency training may also be helpful to nystagmus patients. In this case the patient is required, with the aid of the therapist, to find the null point. The use of this type of vision training in relation to reading efficiency is described by Inde.<sup>3</sup>

---

John Keast was awarded a Churchill Fellowship in 1981 to study teaching methods for the visually impaired. The study was conducted at the Royal Victorian Institute for the Blind, 557 St. Kilda Road, Melbourne, Vic. 3000.

*Reprint requests to:* Kerry Fitzmaurice, School of Orthoptics, Lincoln Institute of Health Sciences, 625 Swanston Street, Carlton, Vic. 3053.

Following one of the author's (J. Keast) visit to the Low Vision Training School in Stockholm, Sweden, where the program outlined by Backman and Inde<sup>7</sup> is in use, the following course was evolved to determine if a program of visual and reading efficiency will enable a visually impaired person to make better use of their residual vision in relation to reading efficiency.

#### METHOD

*Subjects:* Students were drawn from the Tertiary Resources Service of the Royal Victorian Institute for the Blind. A group of ten tertiary students were chosen for the pilot program on a volunteer basis, after attending a seminar describing the program at the Low Vision Training School, Stockholm. The students varied in age, type of tertiary course, level of course and type of eye problem.

*Apparatus:* Lighting equipment provided consisted of—Planet Ibis F 20w fluorescent lamps with daylight, cool white and warm white fluorescent tubes.

Planet Ibis TFT 2 × 15 fluorescent lamps with two daylight, cool white and warm white fluorescent tubes.

Planet Designer Z incandescent lamps with 100w hot spot globe and dimmer attachment.

Reading boards were Luxo Superholder 1001 with table clamp attachment and air pressure foot pedal to control movement of the line guide.

Visual testing equipment consisted of a Bjerrum one metre field screen and targets, the Farnsworth Panel D-15 colour vision test, a

Snellens distance vision chart and Faculty of Ophthalmologist near vision chart. Both large print playing cards and Field Discovery think link word cards.

The location where the program was conducted provided good daylighting and adequate space to allow free movement of the therapist around the student.

*Procedure:* Following selection one student chose not to continue, the remaining underwent a thorough ophthalmological examination and were then placed into one of four categories:

- (a) central scotoma
- (b) nystagmus
- (c) peripheral scotoma
- (d) dense amblyopia due to neglected strabismus (the other eye being no longer viable) or due to high myopia, diabetic retinopathy.

Students attended for a one hour session twice weekly, these sessions being run on a one to one basis with student and therapist. The program ran over a minimum of 15 sessions to a maximum of 22 depending on participants' needs.

Each student was required to do the Co-operative Reading Comprehension Test form M available from ACER, Hawthorn, Victoria (1970). Following the pre test each student was assessed for visual acuity under the working conditions, colour vision and a Bjerrum field was charted for those in the central and peripheral scotoma categories. Students in the nystagmus category were assessed by following a fixation target into the cardinal positions of gaze to determine the null point of their nystagmus. Lighting

TABLE 1  
Comparison of Pre and Post Test Results

Student	Vocabulary % completed		Comprehension % completed		Comprehension % correct	
	Pre	Post	Pre	Post	Pre	Post
1	75	80	38	53	83	78
2	100	100	65	85	63	70
3	43	53	15	33	100	85
4	100	100	85	100	75	73
5	85	100	53	78	73	63
6	100	100	60	78	93	85
7	80	100	53	70	73	83

TABLE 2  
Comparison of reading speed. Tests 1, 2 and 3

Student	Reading speed words/minute per test		
	1	2	3
1	55	57	71
2	144	125	147
3	40	55	56
4	195	166	158
5	160	135	162
6	145	130	145
7	133	138	128

requirements were determined subjectively by the students. Low vision aids, magnifiers and magnilink were available if the students wished to use them. The students then followed the program outlined in Backman O and Inde K.<sup>7</sup> This program included exercises in fixation training, line changing technique and concentration. The program includes three reading tests which the students performed as they progressed. Supplementary exercises were given to re-inforce

TABLE 3  
Comparison of Comprehension Results. Tests 1, 2, 3

Student	Comprehension result % correct per test		
	1	2	3
1	60	91	100
2	60	82	100
3	80	100	100
4	100	82	100
5	80	67	88
6	60	50	100
7	42	58	78

eccentric fixation and null point maintenance. Supplementary exercises were also given in the form of homework at all stages of the program. At the culmination of the training the students did a post test which was the same Co-operative Reading Comprehension Test form M.

Data was collected in the form of test results and a questionnaire on all aspects of the training.

Of the ten students, one chose not to begin due to personal commitments, one withdrew during the program to take up employment. One student has not as yet completed the program.

## DISCUSSION

The aim of this pilot program was to determine if visual efficiency and reading efficiency training could improve a visually impaired student's reading efficiency.

The components chosen to indicate reading efficiency were speed of reading and comprehension of reading material. By comparison of the pre and post tests it can be seen that the reading speed of all but one of the participants on the vocabulary section increased. The one participant who is shown as remaining the same, actually completed the pre test in under the required fifteen minutes and this test was not recorded. Therefore a comparison of pre and post tests for this student was not possible. The comprehension section had a twenty-five minute time limit. None of the participants completed the test in this time at the pre test. Comparison of pre and post tests indicates all participants increased in reading speed of the comprehension section.

The three reading tests administered as a part of the training revealed an overall increase in reading speed with one student remaining the same and two showing a decrease in speed. The three tests varied in length and difficulty and as such were not a controlled measure of reading speed.

The greatest increase in reading speed was shown by the two slowest readers. This may reflect that some students were already reading at close to their maximum efficiency. These results may also be a reflection of course duration. The slowest reading students spent three months on the program and mastered the vision training techniques involved before completion of the program. The students showing a decrease in reading speed spent only two months on the program and had not completely mastered the vision training techniques involved. The need for prolonged re-inforcement in eccentric vision training is consistent with the comments of Wulff<sup>8</sup> and Wellington.<sup>6</sup> The same reinforcement appears necessary to those students learning to maintain their eyes at the null point.

The comprehension component as tested by the pre and post tests indicated an overall

decrease in comprehension with only two students showing improvement. The three reading tests indicated an overall improvement in comprehension. The lack of improvement between the pre and post tests may have been due to students concentration on maintaining their vision technique whilst reading as quickly as possible. Extension of the program so that vision techniques become automatic is desirable, followed by a further re-assessment of both speed and comprehension. The improvement in comprehension shown by the three reading tests may have been due to the students' skills at anticipating the questions. The comprehension questions of each test were of a similar bias.

The reading efficiency of visually impaired students was able to be improved in terms of reading speed following reading and vision training. This is consistent with the results of Fridal, Jansen and Klindt.<sup>1</sup>

Components of the program that were not objectively measured but were revealed subjectively to be of great benefit should also be discussed.

The following is a summary of responses to a questionnaire administered to the students at the conclusion of the program.

1. **Lighting:** All but one student chose a reading lamp to suit their needs. One student found the 2 x 15w cool white fluorescent satisfactory but preferred to work with the natural lighting within the room. None of the students had been aware of the type of lighting available before the program or how to combine background and lamp lighting. All students indicated they would like to continue using the lighting provided by the program for their studies, leisure or work.
2. **Reading Boards:** All of the students found the reading boards were useful aids. Particular reference was made to increased comfort in the reading position, especially alleviation of back and neck cramps. The reading boards allowed easy placing of material so that the student could sit comfortably and place the reading material in the best position for them to see it, i.e. in the position of gaze of the null

point, to allow maximum use of restricted field of vision. Most of the students were unaware of the existence of the boards before the program and all indicated they would like to continue using one.

3. **Vision Training and Explanation:** Five of the seven students were required to learn a new technique to maximize use of their residual vision. One student used an eccentric fixing technique in relation to central scotoma. The remaining four students had nystagmus and therefore needed to maintain their eyes at the null point. The student with the central scotoma was aware of using an eccentric point before the program, however this student felt she was using this technique more effectively after the program. This student was able to identify words within the reading material more accurately and was also applying the technique to her general environment quite successfully. Two of the students with nystagmus were placing material so that their eyes approached the null point, however they were unaware that they were doing this. The other two with nystagmus were not aware of this technique but at the completion of the program were able to place their eyes at the null point and were aware of the difference in the clarity of their vision with their eyes still.

All of the participants felt the time spent, in careful explanation of their eye problems in relation to the vision techniques and reading techniques they were to use, was essential. This pilot program has demonstrated that it is possible to improve the reading efficiency of visually impaired tertiary students. Such a program could be applied with some modification to primary and secondary level students. The vision training aspects of the program could also be applied to leisure activities, general mobility, the work place and daily living skills.

#### References

1. Fridal G, Jansen L, Klindt M. Courses in reading development for partially sighted students. *J Vis Impair Blindn* 1981 (Jan): 4-7.

2. Moore MW. Visual efficiency training with low vision children. *Am Orthopt J* 1972; 22: 68-70.
3. Inde K. Low vision training in Sweden. *J Vis Impair Blindn* 1978 (Oct): 307-10.
4. Goodrich GL, Quillman RD. Training eccentric viewing. *J Vis Impair Blindn* 1977 (Nov): 377-81.
5. Lederer J, Wulff J. No vision ahead. Proceedings 1st Aust-Pac Conf Low Vis, Melb, May 1980.
6. Wellington R. Further roles of the orthoptist in the rehabilitation of the partially sighted. *Aust Orthopt J* 1980-81; 18: 28-9.
7. Backman O., Inde K. Low vision training. Liber Hermods Malmo, 1979.
8. Wulff J. The orthoptist's role in rehabilitation of the partially sighted. *Aust Orthopt J* 1977-80; 17: 59-61.