



Braille Reading Efficiency and Achievement Amongst Primary Five Congenitally and Adventitiously Blind Children in School for the Blind, Gindiri

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ABSTRACT

The study investigated braille reading efficiency of the congenital and adventitious blind children in School for the Blind, Gindiri. Braille reading status of congenital and adventitious blind children in the School for the Blind, Gindiri and the extent to which Braille reading efficiency of blind children relate to their reading achievement, constituted the main focus of the study. Twenty (20) children made up of ten (10) congenital and adventitious blind were used for the study. The researcher orally interviewed the children in order to classify the selected eligible ones into congenital and adventitious blind. A cloze reading passage and test administered on the children were used to source data for the study. Children's reading achievement, that is reading and comprehension rates, were determined by computing each child's reading rate and comprehension per minute. Chi-square (χ^2) statistics was used in testing the formulated research hypothesis. The study found out that: Blind children were not efficient readers; reading errors such as omission, substitution, mispronunciation and repetition of words markedly characterized their reading. While the adventitious blind children comprehended the cloze passage at a very low rate; the congenital blind ones did not comprehend it at all. Again, braille reading rates of the children affected their reading comprehension and achievement. Thus, the reading achievement of the adventitious blind children (4.92wpm) was better than those of their congenital blind counterparts (0.77wpm). The implication of these findings, therefore, is that qualitative training should be given

to primary school teachers, especially braille instructors. Also, children should be given enough opportunity to practice reading using recreative, interesting and enjoyable children's literature.

INTRODUCTION

The education of the visually impaired children involves intensive and extensive use of Braille. This fact makes Braille reading one of the basic skills of communication for successive academic prowess by the visually impaired children. "Braille" refers to an embossed system of reading and writing derived from an arrangement of "six dots" known as the braille cell (a pattern of two vertical and three horizontal dots configuration giving a braille version of anything in print when technically arranged). The American Printing House for the Blind (1987) described braille as the best known medium of reading for blind people. Gusen (1991) refers to it as a simple arrangement of six embossed dots that allow the blind to read through the sense of touch. It is usually "written" either by hand with a "stylus" (a bicycle spoke-like thing) or a Perkins braille machine or most currently by the use of an embosser when connected to a computer system. Whichever method used in braille (or writing braille), reading of brailled text is usually done by touch. In this regard, braille reading efficiency becomes an indispensable tool in the mode of learning by individuals with visual impairment. However, efficiency in reading would depend on how relevant the reader's background knowledge

is, to the content of the brailled text (Iroegbu, 2001). This invariably implies that braille reading is particularly significant in teaching Nigerian children.

STATEMENT OF THE PROBLEM

Braille reading appears to be two or more times slower than print reading. Differentiating braille from print, Abang (2005) observes that braille reading as compared to print is not only a slow process, but also a difficult, frustrating and dull activity. Based on this, it is imperative that slow rate affects rate of reading comprehension. So, braille as a system of reading would undoubtedly affect the reading achievement of the congenitally and adventitiously blind children in a given context.

Apart from the difficulties involved in braille reading, two categories of the blind (congenital and adventitious) exist congruently. These two – congenital and adventitious blind, differ psychologically and experientially from one another. This implies that they have their individual differences, most especially in braille reading. What would then be the braille reading status of blind children in School for the Blind, Gindiri? Is there any relationship in braille reading efficiency and reading achievement of the congenitally and adventitiously blind children?

PURPOSE OF THE STUDY

The purpose of this study is to investigate the braille reading efficiency of the congenitally and adventitiously blind children in the School for the Blind, Gindiri in relation to their reading achievement. Specifically, the study is intended to:

- (1) Identify the braille reading status of congenitally and adventitiously blind children in Gindiri School for the Blind.
- (2) Investigate the relationship between braille reading efficiency and reading achievement of congenitally and adventitiously blind children in the study location.

RESEARCH QUESTIONS

- (1) What is the braille reading status of congenitally blind children in the School for the Blind, Gindiri?
- (2) What is the braille reading status of adventitiously blind children in the School for the Blind, Gindiri?

- (3) To what extent does braille reading efficiency of congenitally and adventitiously blind children relate to their reading achievement?

RESEARCH HYPOTHESES

The two hypotheses formulated were stated in the null form, because they are involved in the statistical testing and data that would be generated and used to either accept or reject the null hypotheses, to support or not to support them (Gay, 1996). Consequently, the two hypotheses are to guide the study:

1. There is no significant difference between braille reading efficiency of congenitally and adventitiously blind children in the School for the Blind, Gindiri.
2. There is no significant relationship between braille reading efficiency and reading achievement of the blind children in the School for the Blind, Gindiri.

METHODOLOGY

Research Design:

The study is comparative in nature. The choice of this research design was to enable the researcher to compare the braille reading efficiency of congenitally and adventitiously blind children in the School for the Blind, Gindiri in relation to their Braille reading achievement.

Population and Sample

The target population of this study is the School for the blind Children, Gindiri in Mangu Local Government Area of Plateau State. It is a special residential primary school, which runs a special mainstreaming (i.e. admitting sighted children as well in the same academic environment) programme. A sample of twenty (20) blind children was drawn for the study using simple random sampling technique. The sample comprised of ten (10) congenitally and adventitiously blind pupils from the population respectively. This was done to ensure that the two samples (congenitally and adventitiously blind children) have equal chances of being a representative of the population from which they were selected.

Instruments for data collection

Two researcher-developed and validated instruments were used for the data collection.

These were interview and cloze test. While the interview schedule elicited information on the age of onset and nature of pupils' blindness as well as their reading instructional mode, the cloze test was used to determine the braille reading efficiency of the two categories of the blind (congenital and adventitious) respectively. The researcher asked the children the following four uniformed questions in order to identify the congenitally and adventitiously blind amongst them:

- (1) When did you become blind?
- (2) What medium do you use in reading?
- (3) What braille grade can you read?
- (4) Do you have any problem(s) reading braille?

Procedure for data collection

The participants were interviewed in their dormitories by the researcher on one-to-one basis in order to discover the congenitally and adventitiously blind children amongst the school population; while the cloze test was administered on the twenty eligibly selected participants by the researcher with the assistance of a competent research assistant.

At the end of the interview, the children's responses were scrutinized and grouped accordingly; and a cloze test was administered in braille to them. This was done to enable them read the brailled passage themselves. However, the researcher ensured that a relatively easy and interesting passage was taken from the Bible. Thus, it was a sample of the level of reading material they would normally read independently.

Each of the selected blind children was first given the brailled cloze passage to read once

only. The children were instructed to verbalize their reading and ensure that they understand what they read; as they would be required to answer some comprehension questions afterwards. This was done in order that the researcher or the research assistant would listen to each child as he/she reads. Also, to enable the researcher or his assistant notes each child's reading efficiency. In this regard, the time each reader started and ended reading was recorded. That is to say that each child was clocked and observed to keep accurate reading rate while ensuring that none reads the passage twice. Thereafter, brailled questions based on the passage read were given to the children to answer. The test consisted of ten (10) subjective questions.

Method of data analysis

Each child's reading rate was computed by calculating the number of words read per minute. Rate of comprehension was then determined by multiplying the number of comprehension questions answered correctly, divided by total number of comprehension questions asked. The results were tabulated and analyzed based on the research questions formulated to guide the study. The chi-square (χ^2) statistics was used in testing the hypotheses.

RESULTS

Research Question I

What is the braille reading status of congenitally blind children in School for the Blind, Gindiri?

Table I: Reading Achievement of the Congenitally Blind Children on the Cloze Passage Test. N = 10

S/N	No. of words read	Rate in minutes	Words per minute (n_1)	No. of questions asked (x)	No. of questions answered correctly (n_2)	Rate of comprehension (RC)
1	200	23	8.7	10	2	1.74
2	200	20	10	10	6	6
3	200	30	6.7	10	0	0
4	200	48	4.2	10	0	0
5	200	20	10	10	0	0
6	200	35	3.7	10	0	0
7	200	40	5	10	0	0
8	200	35	5.7	10	0	0
9	200	40	5	10	0	0
10	200	30	6.7	10	0	0

200 words frequency table

$$\text{Mean Reading Rates } \frac{(\sum n_1)}{N} = \frac{65.7}{10} = 6.57\text{wpm}$$

$$\text{Mean Comprehension Rates } \frac{(\sum RC)}{N} = \frac{1.80}{10} = 0.77\text{wpm.}$$

Table 1 indicates that the mean reading rates of the congenitally blind children on the cloze passage test was 6.57wpm. When this was adjusted to reflect their rate of comprehension (RC), it fell to 0.77 words per minute (wpm).

Research Question 2

What is the braille reading status of adventitiously blind children in the School for the Blind Children, Gindiri?

Table 2: Reading Achievement of the Adventitiously Blind Children on the Cloze Passage Test. N = 10

S/N	No. of words read	Rate in minutes	Words per minute (n ₁)	No. of questions asked (x)	No. of questions answered correctly (n ₂)	Rate of comprehension (RC)
1	200	45	4.4	10	0	0
2	200	15	14.3	10	0	0
3	200	15	14.3	10	8	11.44
4	200	20	10.0	10	9	9
5	200	32	6.3	10	7	4.41
6	200	20	10.0	10	8	8
7	200	15	14.3	10	4	5.72
8	200	40	5.0	10	9	4.5
9	200	58	3.5	10	6	2.1
10	200	30	6.7	10	6	4.02

200 words frequency table

$$\text{Mean Reading Rates } \frac{(\sum n_1)}{N} = \frac{88.8}{10} = 8.88\text{wpm}$$

$$\text{Mean Comprehension Rates } \frac{(\sum RC)}{N} = \frac{49.19}{10} = 4.92\text{wpm.}$$

Table 2 indicates that the mean reading rates of the adventitiously blind children on the cloze passage test is 8.88 words per minute (wpm). When the mean reading rate was adjusted to reflect their rate of comprehension (RC), it fell to 4.92wpm.

Research Question 3

To what extent does braille reading efficiency of congenitally and adventitiously blind children relate to their reading achievement?

Table 3: Mean Reading Rates of the Congenitally and Adventitiously Blind Children Compared.

	Congenitally Blind	Adventitiously Blind
Mean Reading Rates	6.57wpm	8.88wpm

Table 3 compared the mean reading rates of the congenitally and adventitiously blind children. The Table indicates that congenitally blind children read at the rate of 6.57wpm what the

adventitiously blind children read at 8.88pwm. This implies that the adventitiously blind children read faster than their congenitally blind counterparts. The implication of this result is that children in the

School for the Blind, Gindiri do not read braille efficiently since their reading rates could not measure to 90wpm what authorities (Harley;

Henderson; & Truan, 1979) considered about average for readers in the upper elementary grades.

Table 4: Mean Reading Comprehension of the Congenitally and Adventitiously Blind Children Compared.

Mean Comprehension Rates	Congenitally Blind	Adventitiously Blind
	0.77wpm	4.92wpm

Table 4 compared the mean rates of comprehension of the congenitally and adventitiously blind children under study. The Table shows that the mean rate of comprehension of the congenitally blind children is 0.77wpm whereas that of the adventitiously blind children is 4.92wpm. This means that the adventitiously blind children comprehended the cloze passage at a very low rate whereas the congenitally blind children did not comprehend the cloze passage. This result indicates that the blind children in the study location are generally not efficient braille readers. However, from the two mean scores of rate of comprehension, it is deducible that reading achievement of the adventitiously blind children (4.92wpm) is better than those of their congenitally blind counterparts who comprehended the cloze passage at 0.77wpm. This could be attributed to factors such as the fact that the adventitiously blind children had already

developed and/or mastered reading readiness skills before they lost their sight. Also, the area that directly affects the reading achievement of the children under study was the quality and nature of reading instruction at the primary school level. For instance, Dakur (1983) observed that very little silent reading is carried out in the classroom, while chorus reading was in vogue with the class reading after the teacher. Iroegbu (2001) contributed that reading instructional practices in many Nigerian Primary Schools largely emphasize oral reading and pronunciation rather than comprehension. This situation was evident in the present study location.

Hypothesis 1

There is no significant difference between braille reading efficiency of the congenitally and adventitiously blind children in the School for the Blind, Gindiri.

Table 5: Summary of Chi-square (χ^2) Analysis of Differences in Braille Reading Efficiency of Congenitally and Adventitiously Blind Children in the Study Location.

Sample	f_o	f_e	$f_o - f_e$	$(f_o - f_e)^2$	$\frac{\sum (f_o - f_e)^2}{f_e}$
Congenitally Blind	6.57	5.36	1.21	1.46	0.27
Adventitiously Blind	8.88	10.09	- 1.21	1.46	0.15
Total					0.42

Table 5 above shows the chi-square (χ^2) analysis of differences in Braille reading efficiency of congenitally and adventitiously blind children in the study location. The Table indicates that the calculated chi-square (χ^2) is 0.42. But the critical (or table) value of χ^2 at 0.05 level of significance at 1 degree of freedom (df) is 3.84; hence the null hypothesis which stated that "There is no significant difference in between braille reading

efficiency of congenitally and adventitiously blind children in School for the Blind, Gindiri is retained."

Hypothesis 2

There is no significant relationship between braille reading efficiency and reading achievement of the blind children in the School for the Blind, Gindiri.

Table 6: Summary of Chi-square (χ^2) Analysis of Relationship in Braille Efficiency and Achievement of Congenitally and Adventitiously Blind Children in School for the Blind, Gindiri.

Category	f_o	f_e	$f_o - f_e$	$(f_o - f_e)^2$	$\frac{\sum (f_o - f_e)^2}{f_e}$
Congenitally blind	6.57	5.36	1.21	1.46	0.27
	0.77	1.98	-1.21	1.46	0.74
Adventitiously blind	8.88	10.09	-1.21	1.46	0.14
	4.92	3.71	1.21	1.46	0.39
Total					1.54

Table 6 indicates that the computed (calculated) chi-square (χ^2) is 1.54.

Hence the critical value of χ^2 at 0.05 level of significance at 1 degree of freedom (df) = 3.84. So, from Table 6 analysis, the computed χ^2 (1.54) is less than the critical value of χ^2 (3.84). Therefore, the null hypothesis, which stated that "There is no significant relationship between braille reading efficiency and reading achievement of blind children in School for the Blind, Gindiri" is retained.

DISCUSSION OF FINDINGS

The results of the present study clearly indicates that there is a serious need to improve the reading (efficiency) of blind children in our schools, most especially in the study location. Specifically, two problems emerged: (1) the mean reading rates (not taking comprehension into consideration) were 8.88 and 6.57 wpm for the adventitious and congenital blind children respectively. This reading rate is so low that it would seriously and negatively affect the ability of the children to cover any assigned text effectively. Citing Smith (1978), Iroegbu (2001) reiterates that a reading rate below 200 words per minute interferes with comprehension. No wonder this study found that on the average, the readers comprehended only 4.92 (for the adventitious blind) and 0.77 (for the congenital blind) word per minute of the passage read. (2) Reading errors such as omission, substitution, mispronunciation and repetition of words were conspicuously observed during the reading test amongst the selected blind children used in the study with particular reference to the congenitally blind ones.

Nevertheless, it was noted earlier that rate of comprehension (i.e. reading efficiency in

this context) is affected by text and reader factors, such as the interaction between the reader and text. It appears that the area that directly affects the reading performance of school children is the quality and nature of reading instruction at the primary school level. For instance, Dakur (1983) observed that very little silent reading is carried out in the classroom, while chorus reading was in vogue with the class reading after the teacher. Iroegbu (2001) contributed that reading instructional practices in many Nigerian Primary Schools largely emphasize oral reading and pronunciation rather than comprehension. This situation is evident in the present study location. It is however, important to note that it is at the primary level that educational foundation is laid. Whatever reading skills and habits developed at this foundational level, are automatically carried over to secondary school.

Poor reading habit could be remedied by improving the quality of training given to primary school teachers, especially those handling braille reading instruction. To achieve this, it is recommended that a separate course in developmental reading instruction be incorporated into all training programmes for primary school teachers. Besides, children (including the blind) should be provided with abundant opportunity to practice reading materials, which are at their independent reading levels. Research (Laberge & Samuels, 1985) has it that practice in reading relatively easy materials helps a reader to develop automaticity in word recognition. This implies that the reader develops the skill of recognizing unfamiliar words in variety of different contexts without interrupting his thought-flow to observe individual words in an attempt to pronounce them.

Difficult textbooks do not motivate independent reading. On the other hand, children's literature which is recreational in nature could be interesting and enjoyable. Such literature could help a great deal in developing reading habit in children and subsequently enhance their reading efficiency.

CONCLUSION

Braille is to the blind what print is to the sighted. Though the braille reader may be 2 or 3 times slower than the print reader, the ability to read braille avails the blind a bank of information for effective communication and functioning in the society. However, braille efficiency by the blind may differ from one individual to another inasmuch as no two individuals are psychologically the same. Besides, reading and/teaching method that suits child "A" may not profit "B".

The teacher, as an important factor in the teaching-learning activity, needs to develop and encourage braille reading proficiency in the blind children. This he could do through motivation, training in words and character recognition, innovations in Braille reading mechanics and presentation of short but interesting reading materials. Also, individualized education plan (IEP) among other teaching methods could enable the teacher identify problems in braille reading amongst the blind children and to select suitable approach that would enhance meaningful reading by this category of readers.

RECOMMENDATIONS/ SUGGESTIONS

Based on the findings of the present study; the following recommendations/suggestions are tenable:

- (1) Beginning reading materials should be designed to minimize ambiguities caused by contractions and to emphasize experience common to the blind.
- (2) The number of uses and meanings assigned to contractions should be reduced to facilitate braille reading efficiency (i.e. speed and comprehension).
- (3) Emphasis should be laid on character recognition in the early stages of reading instruction, especially with the congenitally blind child.

- (4) More cues for recognition of word-signs or short form words should be provided to the blind reader.
- (5) Reading efficiency (i.e. reading speed and comprehension) should be emphasized at all levels of education of the blind.

REFERENCES

- Abang, T.B. (2005). *The exceptional child: A handbook of special*. Jos: FAB Educational Books.
- American Printing House for the Blind (1987). *Serving visually impaired people since 1858*. New York: APHB.
- Dakur, M. (1983). An investigation into reading instruction in some selected primary schools in Jos Metropolis. Unpublished B.Ed. Project, University of Jos.
- Gay, L.R. (1996). *Educational research: Competences for analysis and application*. New Jersey: Prentice-Hall.
- Gusen, N.J. (1991). The teaching of braille: A case study of selected schools in Plateau State, Nigeria. Unpublished B.Ed. Project, University of Jos.
- Harley, K.R.; Henderson, M.F. & Truan, B.M. (1979). *The teaching of braille reading*. Illinois: Charles C. Thomas.
- Iroegbu, U.V. (2001). A comparative study of the effect of braille reading ability on the academic performance of the congenital and adventitious blind students in the University of Jos. Unpublished M.Ed. Thesis, University of Jos.
- Laberge, D. & Samuels, S.J. (1985). Toward a theory of automatic processing in reading. In H. Singer & R. Ruddel (Eds.). *Theoretical models and processes of reading*. Newark, DE: International Reading Association.