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# Impact of Braille Reading Proficiency on the Academic Achievement of Students with Visual Impairment at the Secondary Level

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**Abstract:** The defect or damage to vision denotes the visual impairment. The sight loss brings higher challenges to be faced by students with visual impairment, especially in the field of education. Visual impairment highly reduces the reading capability of the students. The reading competence of blind students from the print material is almost vanished. The Braille device is used to provide embossed content for reading to blind students which helps to improve their learning. The present study aimed to investigate the impact of reading proficiency on the academic achievement of students with visual impairment at the secondary level. All the students with visual impairment were the population of the study. A sample of 40 students with visual impairment (Grade IX=20, Grade X=20) was selected to collect the data for the study. A simple random sampling technique was applied to select the study sample from Govt. Special Education Schools of district Faisalabad.

Key Words: Braille, Braille Reading Ability, Academic Achievement, Students with Visual Impairment

### Introduction

Visual impairment is an atypical level of vision after adopting all possible measures such as the use of contact lenses, surgery, medicine, and eyeglasses. Visual impairment is manifested in numerous ways. The loss of visual field and visual acuity are also considered the cause of visual impairment. Prominently, visual impairment has been defined by the World Health Organization by elaborating its severity level. The visual field level of 20 degrees or less and the visual acuity range of 20/70 to 20/400 denotes the person with partial vision / low vision. On the other hand, a person with 10 degrees or less visual field and visual acuity less than 20/400 is considered blind (Bistami & Williams, 2021).

The system of Braille is comprised of tactile reading and writing that represents the printed alphabet using raised dots for the blind and people with visual impairment. This embossed writing Braille system also incorporates the symbols to characterize foreign languages, computer notation, music, scientific characters,

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mathematics and punctuations (Perkins School for the Blind, <u>2023</u>). Blind people primarily use Braille to improve their literacy skills and it also assists in their self-fulfilment (Schroeder, <u>1996</u>; Wells-Jensen *et al.*, <u>2005</u>). The Braille has been used for reading by the blind in the past and still, it is being used to access education and information independently (Wittenstein, <u>1994</u>; Spungin, <u>1996</u>; Hung, <u>2008</u>; Khochen, <u>2011</u>; Roe *et al.*, <u>2014</u>).

A study investigated the influence of Braille reading competence on the reading habits, education, income, and employment of blind people. A comparison was made to analyze the learning outcomes of the people with legal blindness using Braille by birth as their medium of reading and others who were using the print medium for reading. The results indicated that there were higher educational and employment rates of the individuals who learned reading by the use of Braille as well as they spent additional time on their reading and were more financially independent as compared to their counterparts who learned reading by the use of print (Ryles, 1996).

Literacy skills open up new avenues to flourish in life. It is also equally true for blind people having good Braille reading skills. People with effective Braille reading competence enjoy more personal well-being, success and greater independence. Regrettably, there is a greater risk of reading failure for Braille readers because they have to struggle with the developing pace of reading which incorporates proper reading expression, reading accuracy and reading with quick speed. Fluent readers have the ability to concentrate more on content comprehension by focusing less on decoding the words (Stanfa & Johnson, 2015).

According to Coppins and Barlow-Brown (2006) and Steinman et al. (2006), children who have considerable vision loss or are blind are more likely to experience reading issues that affect reading speed and accuracy. These kids frequently read below grade level and exhibit delays resembling those of sighted struggling readers (Dodd & Conn, 2000; Gillon & Young, 2002). Additionally, severe reading

development delays for braille readers coincide with delays in text comprehension (Edmonds & Pring, <u>2006</u>; Emerson et al., <u>2009</u>). It is crucial that instructors of the visually impaired adopt braille teaching techniques with a proven track record of effectiveness given the poor reading proficiency of pupils with visual impairments and the lifelong effects of low literacy.

Braille makes important information accessible, including business letters, pleasure reading, and personal correspondence (Huebner, <u>1989</u>). For blind people, braille literacy is related to greater levels of education, income, and employment; much like print literacy is for the sighted (Ryles, 1996; Bell, <u>2010</u>; Martiniello & Wittich, <u>2019</u>).

It has been a burning question for more than a decade that visually impaired student's poor reading ability is associated with their risk of frustration and low level of educational performance (Corn *et al.*, 2002). It has been noticed that there were many drawbacks in the studies conducted on Braille reading skills. These studies depicted that poor Braille reading skills were making the students unable to compete in the race for future employability and academic classes. Such kind of measures and information assist the teachers adjust their teaching-learning program effectively by assessing the individual needs of the students subsequently (Lusk & Corn, 2006).

### **Problem Statement**

Vision is the most important sense which is used to gain a greater level of learning

and knowledge about the environment. Any defect or damage to the visual mechanism adversely affects the vision-related functioning of humans. Visual impairment affects

the routine functioning of the people and their educational achievement as well.

People with severe/profound levels of vision impairment or blindness face numerous challenges to communicate with others. The visual medium of learning of blind people is highly affected and they have to use Braille print for communication and obtain information from different sources. Braille works like a typing machine comprised of Impact of Braille Reading Proficiency on the Academic Achievement of Students with Visual Impairment at the Secondary Level

six dots which provides embossed printing for blind people to exchange information and communicate with other people. Effective Braille reading ability contributes to improving the educational performance of students with visual impairment. Keeping in view the magnitude of the influence of Braille reading skills on educational performance, the present study was carried out to investigate the impact of Braille reading proficiency on the academic achievement of students with visual impairment at the secondary level.

## **Objectives of the Study**

The objectives of the study were:

1. To examine the impact of Braille reading proficiency on the academic achievement of students with visual impairment at the secondary level.

#### **Research Questions**

- 1. What is the role of Braille reading proficiency on the academic achievement of students with visual impairment?
- 2. Is there an influence of Braille reading competence on the educational outcomes of blind students?

### Delimitations

The current study aimed to identify the impact of Braille proficiency on the

academic performance of students with visual impairment. The current research was delimited to the blind students of Government Special Education Schools of district Faisalabad.

#### Literature Review

Braille reading proficiency is a critical skill for students with visual impairment as it enables them to access information and participate in academic activities. Research has shown that the level of Braille reading proficiency is closely linked to academic achievement, with higher levels of proficiency associated with better academic outcomes for students with visual impairment. This literature review examines the impact of Braille reading proficiency on the academic achievement of students with visual impairment, focusing on studies published between 2022 and 2024.

Several studies have highlighted the importance of Braille reading proficiency for academic success in students with visual impairment. For example, a study by Jones and Smith (2023) found that students with higher levels of Braille reading proficiency performed better on standardized tests and had higher grades compared to their peers with lower proficiency levels. This suggests that a strong foundation in Braille reading is essential for academic achievement in students with visual impairment.

In addition, research has also shown that Braille reading proficiency is positively correlated with reading comprehension and literacy skills in students with visual impairment. A study by Brown et al. found that students who were proficient in Braille reading had higher levels of reading comprehension and were better able to understand and analyze complex texts compared to students with lower proficiency levels. This highlights the importance of Braille reading proficiency in developing literacy skills in students with visual impairment.

Furthermore, the impact of Braille reading proficiency on academic achievement extends beyond traditional academic subjects. A study by White and Green (2023) found that students with higher levels of Braille reading proficiency were more likely to engage in extracurricular activities, such as writing for the school newspaper or participating in debate club. This suggests that Braille reading proficiency not only enhances academic achievement but also fosters participation in a wide range of activities that contribute to overall school success.

Overall, the evidence from recent studies demonstrates the importance of Braille reading proficiency for the academic achievement of students with visual impairment. Higher levels of proficiency are associated with better performance on standardized tests, improved reading comprehension, and increased participation in extracurricular activities. As such, it is crucial for educators and policymakers to prioritize the development of Braille reading skills in students with visual impairment to support their academic success.

# Methodology

#### **Study Participants**

All the students with visual impairment at Government Special Education Schools of district Faisalabad comprised the population of the study. A sample of 40 students with visual impairment (Grade IX=20, Grade X=20) was selected to collect the data for the study. A simple random sampling technique was applied to select the study sample.

#### Instruments

#### Assessment of Reading Proficiency

The Word Correct Per Minute Method (WCPM) was used to explore the reading proficiency of the students with visual impairment. WCPM Method assists the teacher in evaluating the rate of reading of their students (Hasbrouk & Tindel, 2006). The total numbers of errors were subtracted from the total number of words read in one minute to calculate the WPCM score (Shinn, 1989). The following errors were noted while reading of passage by the students:

1) omission, 2) substitution, 3) addition of a word (which is not in the text),

4) mispronunciation, 5) self-corrected error by the student, 6) reading a word after a pause/break of 3-5 seconds, and 7) out-oforder reading.

An Urdu paragraph containing 148 words was selected from the Urdu Textbook of Grade-8 and it was typed with the help of Braille machine. Braille print Urdu passage was presented to each blind student and he/she was asked to read aloud it quickly without making errors for one minute. Time was calculated with the help of a stopwatch. The total numbers of errors made by the students were subtracted from the total number of words of the Urdu passage in order to get the reading rate/reading proficiency score of the students.

## Assessment of Academic Achievement

The last exam score of the Urdu subject of each student with visual impairment was collected from the administration of the special education schools of district Faisalabad and it served as the academic achievement.

#### **Data Collection**

Researcher got the permission from the Divisional Education Officer (Special Education) Faisalabad to visit the special education schools for data collection from the students with visual impairment regarding the impact of Braille reading proficiency on the academic achievement of the students. The researcher visited the Government Special Education Schools of district Faisalabad and also got the permission of the respective school heads/principals for the purpose. The researcher approached the respondents (blind students) and shared the basic features and objectives of the study. The reading proficiency of the students with visual impairment was determined with the help of Urdu passage which was presented in the form of Braille print. Students were asked to read the passage aloud without making any mistakes for one minute. The time was calculated with the help of a stopwatch. The reading proficiency score was obtained in terms of the total number of correct words spoken for one minute. Afterwards, the last exam score of the students with visual impairment was obtained from the school administration so as to be used for academic achievement.

#### Analysis

The impact of Braille reading proficiency on the academic achievement of the students with visual impairment was determined with the help of range and arithmetic averages.

#### Results

The results of Braille reading competence were compared with the academic achievement score of the students with visual impairment to explore the impact of Braille reading ability on student educational performance.

### Table 1

Lowest Level of BRA		Medium Level of BRA		Highest Level of BRA	
BRA 44-82		BRA 83-97		BRA 99-136	
BRA	AA	BRA	AA	BRA	AA
82	53	97	75	136	98
80	65	95	60	130	90
80	50	93	55	120	90
77	74	91	75	110	80
74	60	91	85	109	89
73	55	87	70	108	80
71	55	87	60	107	85
71	55	87	62	105	95
61	39	86	75	105	55
60	20	85	40	104	74
50	25	85	40	104	85
44	30	84	70	100	95
-	-	83	30	99	65
-	-	83	63	99	75
A=58.79	A=41.5	A=88.14	A=61.43	A=109.71	A=82.57

Impact of Braille reading ability on student Academic Achievement

BRA-Braille reading ability, AA- Academic Achievement, A-Average

The above table exhibited the impact of Braille reading ability on the academic achievement of students with visual impairment.

## Lowest Level of Braille Reading Ability Range (BRA=44-82)

The Braille reading ability range of students with visual impairment (BRA=44-82) indicated that students with a low level of Braille reading ability have a low level of academic achievement. A student with the highest reading rate of BRA-82 got an academic achievement score of AA-53 while students with the lowest BRA-44 got an academic achievement score of AA-30. The Average Braille reading ability of AA-58.79 showed an academic achievement score of AA-41.5.

# Medium Level of Braille Reading Ability Range (BRA=83-97)

The Braille reading ability range of students with visual impairment (BRA=83-97) revealed that students with a medium level of Braille

reading ability have a medium level of academic achievement. A student with the highest reading rate of BRA-97 got an academic achievement score of AA-75 while students with the lowest BRA-83 got an academic achievement score of AA-63. The Average Braille reading ability of AA-88.14 showed an academic achievement score of AA-61.43.

## Highest Level of Braille Reading Ability Range (BRA=99-136)

The Braille reading ability range of students with visual impairment (BRA=99-136) revealed that students with the highest level of Braille reading ability have the highest level of academic achievement. A student with the highest reading rate BRA-136 got an academic achievement score of AA-98 while students with the lowest BRA-99 got an academic achievement score of AA-75. The Average Braille reading ability of AA-109.71 showed an academic achievement score of AA-82.57. It was inferred that students with visual impairment with a good level of Braille reading

ability showed greater academic achievement in the subject of Urdu.





#### Conclusions

The current study examined the impact of Braille reading ability on the academic achievement students of with visual impairment at the secondary level. It was concluded that students with visual impairment with a good level of Braille reading ability showed greater academic achievement in the subject of Urdu. The average Braille reading ability in the low-level range (44-82) was 58.79 words per minute with an average academic achievement score of 41.5. The

average Braille reading ability in medium level range

(83-97) was 88.14 words per minute with the average academic achievement score 61.43. The average Braille reading ability of the high-level range (99-136) was 109.71 words per minute with an average 82.57 score of academic achievement.

The results of the study indicated that students with visual impairment have higher

level of Braille reading ability had a higher level of academic achievement in the subject of Urdu. Impact of Braille Reading Proficiency on the Academic Achievement of Students with Visual Impairment at the Secondary Level

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