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**APPENDIX I**  
**PERSONAL DATA SHEET**

1. Name of the Student :
2. Class :
3. Gender :
4. Age :
5. Name of the School :
6. Phone number :
7. Address for Communication :

## APPENDIX II

**RATING SCALE TO KNOW THE IMPACT OF TECH AIDED GRADE2  
BRAILLE TUTORING SYSTEM**

S.No	Statements	St.Ag	Agree	Dis.Aa	St.DA
<b>a. Existing Knowledge on Grade II Braille Manual</b>					
1.	VI students use Mechanical brailler for learning				
2.	VI students use braille sheet to read				
3.	VI students use braille sheet to write				
4.	VI students use computers to read				
5.	VI students use computers to write				
6.	VI students use Grade-II Braille to read and write before introduction of tech aided Braille tutoring system				
7.	VI students use Alphabet word signs to read				
8.	VI students use Group signs to read and write				
9.	VI students use Dot5 initial letter, Dot 4-5 initial letter to read				
10.	VI students use short forms to read				
<b>B .Application of Tech aided Grade II Braille tutoring system</b>					
1.	VI students are able to use Grade-II Braille to learn				
2.	Audio format synchronize with the video format				
3.	Standing alone contractions are sequentially graded				
4.	VI students are able to learn word meaning ,spelling in the standing alone contractions				
5.	VI students can learn Alphabet word signs, group signs, short forms to read and write.				
<b>c. Tech aided Grade II Braille tutoring system as a learning tool</b>					
1.	Tool is self Instructional				
2.	Helpful to learn Braille Individually				
3.	Useful to practice Individually				
4.	Tool is self-evaluative				
5.	Time taken to learn braille is lesser than time taken to learn Braille manual script				

S.No	Statements	St.Ag	Agree	Dis.Aa	St.DA
<b>d. Advantages of Tech aided Grade II Braille tutoring system</b>					
1.	No need for Internet Connectivity				
2.	Any time students can practice tool to learn braille				
3.	Minimum computer keys are used to avoid complications				
4.	Students can frequently shift to modes such as Learning ,Practice and Evaluation facilitating learning Braille.				
5.	Tool can be used by all individuals who knows braille				
<b>e. Usability</b>					
1.	Tool is graded and is useful to student teachers for self-learning				
2.	Minimizes the task of teachers to teach				
3.	Poor learners can also use the tool repeatedly to enhance their skills in learning braille				
4.	There is no need to prepare Instructional materials(paperless)				
5.	Effective for use in online teaching				
6.	Instructions can be implemented to many students in one go				
7.	Tool will be helpful when there is scarcity of special teachers				
8.	Tool is helpful in peer tutoring.				
9.	Tool is helpful for Parents to support their wards.				
10.	Tool is helpful to enhance Braille learning and thereby improves Braille literacy .				
<b>f. Challenges</b>					
1.	Basic computer knowledge is required to learn grade-II braille				
2.	Distracted to monotonous voice/Audio clarity				
3.	Tool is one way communication				
4.	Less of interaction with peer group & special teachers				
5.	Limits the tactual mode of learning.				

**APPENDIX III**  
**PRE AND POST TEST TOOL (MANUAL BRAILLE CODES)**

**APPENDIX IV**  
**ALPHABET AND GRADE2 BRAILLE CODES**

**1. Alphabet (26 letters)**

Braille Code	● ○ ○ ○ ○ ○	● ○ ● ○ ○ ○	● ● ○ ○ ○ ○	● ● ○ ● ○ ○	● ○ ○ ● ○ ○	● ● ● ○ ○ ○	● ● ● ● ○ ○
Alphabet word sign	a	b	c	d	e	f	g
Braille cell	1	1-2	1-4	1-4-5	1-5	124	1-2-4-5
Keys corresponding to Braille cell	F	F-D	F-J	F-J-K	F-K	F-D-J	F-D-J-K
Braille Code	● ○ ● ● ○ ○	○ ● ● ○ ○ ○	○ ● ● ● ○ ○	○ ● ● ● ○ ○	● ○ ● ○ ● ○	● ● ○ ○ ● ○	● ● ○ ● ● ○
Alphabet word sign	h	i	j	k	l	m	n
Braille cell	1-2-5	2-4	2-4-5	1-3	1-2-3	1-3-4	1-3-4-5
Keys corresponding to Braille cell	F-D-K	D-J	D-J-K	F-S	F-D-S	F-S-J	F-S-K
Braille Code	● ○ ○ ● ● ○	● ● ● ○ ● ○	● ● ● ● ● ○	● ○ ● ● ● ○	○ ● ● ○ ● ○	○ ● ● ● ● ○	● ○ ○ ○ ● ●
Alphabet word sign	o	p	q	r	s	t	u
Braille cell	1-3-5	1-2-3-4	1-2-3-4-5	1-2-3-5	2-3-4	2-3-4-5	1-3-6
Keys corresponding to Braille cell	F-S-K	F-D-S-J	F-D-S-J-K	F-D-S-K	D-S-J	D-S-J-K	F-S-L
Braille Code	● ○ ● ○ ● ●	○ ● ● ● ○ ●	● ● ○ ○ ● ●	● ● ○ ● ● ●	● ● ○ ● ● ●	● ○ ○ ● ● ●	● ○ ○ ● ● ●
Alphabet word sign	v	w	x	y	z		
Braille cell	1-2-3-6	2-4-5-6	1-3-4-6	1-3-4-5-6	1-3-5-6		
Keys corresponding to Braille cell	F-D-S-L	D-J-K-L	F-S-J-L	F-S-J-K-L	F-S-K-L		

## 2. Alphabet Word Signs (23 words)

	Abbreviation-Alphabet Word Signs					
	but	can	not	people	quite	you
Braille code	● ○ ● ○ ○ ○	● ● ○ ○ ○ ○	● ● ○ ● ● ○	● ● ● ○ ● ○	● ● ● ● ● ○	● ● ○ ● ● ●
Alphabet word sign	b	c	n	p	q	y
Braille cell	1-2	1-4	1-3-4-5	1-2-3-4	1-2-3-4-5	1-3-4-5-6
Keys corresponding to Braille cell	F-D	F-J	F-S-J-K	F-D-S-J	F-D-S-J-K	F-S-J-K-L
	Abbreviation					
	knowledge	like	more	rather	so	that
Braille code	● ○ ○ ○ ● ○	● ○ ● ○ ● ○	● ● ○ ○ ● ○	● ○ ● ● ● ○	○ ● ● ○ ● ○	○ ● ● ● ● ○
Alphabet word sign	k	l	m	r	s	t
Braille cell	1-3	1-2-3	1-3-4	1-2-3-5	2-3-4	2-3-4-5
Keys corresponding to Braille cell	F-S	F-D-S	F-S-J	F-D-S-K	D-S-J	D-S-J-K
	us	very	will	it	as	
	● ○ ○ ○ ● ●	● ○ ● ○ ● ●	○ ● ● ● ○ ●	● ● ● ○ ○ ●	● ○ ○ ● ● ●	
Alphabet word sign	u	v	w	x	z	
Braille cell	1-3-6	1-2-3-6	2-4-5-6	1-2-4-6	1-3-5-6	
Keys corresponding to Braille cell	F-S-L	F-D-S-L	D-J-K-L	F-D-J-L	F-S-K-L	
	do	every	from	go	have	just
	● ● ○ ● ○ ○	● ○ ○ ● ○ ○	● ● ● ○ ○ ○	● ● ● ● ○ ○	● ○ ● ● ○ ○	○ ● ● ● ○ ○
Alphabet word sign	d	e	f	g	h	j
Braille cell	1-4-5	1-5	1-2-4	1-2-4-5	1-2-5	2-4-5
Keys corresponding to Braille cell	F-J-K	F-K	F-D-J	F-D-J-K	F-D-K	D-J-K

**3. Strong Word/Group Signs (17 words)**

	Abbreviation/group signs					
	and	the	ar	gh	er	ow
Braille code	● ● ● ○ ● ●	○ ● ● ○ ● ●	○ ● ○ ● ● ○	● ○ ● ○ ○ ●	● ● ● ● ○ ●	○ ● ● ○ ○ ●
Braille cell	1-2-3-4-6	2-3-4-6	3-4-5	1-2-6	1-2-4-5-6	2-4-6
Keys corresponding to Braille cell	F-D-S-J-L	D-S-J-L	S-J-K	F-D-L	F-D-J-K-L	D-J-L
	for	of	sh	th	st	ou
Braille code	● ● ● ● ● ●	● ○ ● ● ● ●	● ● ○ ○ ○ ●	● ● ○ ● ○ ●	○ ● ○ ○ ● ○	● ○ ● ● ○ ●
Braille cell	1-2-3-4-5-6	1-2-3-5-6	1-4-6	1-4-5-6	3-4	1-2-5-6
Keys corresponding to Braille cell	F-D-S-J-K-L	F-D-S-K-L	F-J-L	F-J-K-L	S-J	F-D-K-L
	with	wh / which	ch / child	ed	ing	
Braille code	○ ● ● ● ● ●	● ○ ○ ● ○ ●	● ○ ○ ○ ○ ●	● ○ ● ● ○ ●	○ ● ○ ○ ● ●	
Braille Cell	2-3-4-5-6	1-5-6	1-6	1-2-4-6	3-4-6	
Keys corresponding to Braille cell	D-S-J-K-L	F-K-L	F-L	F-D-J-L	S-J-L	

**Lower Signs (10 words)**

	Abbreviation-Lower Signs				
	bb be	cc con	dis	enough	his
Braille code	○ ○ ● ○ ● ○	○ ○ ● ● ○ ○	○ ○ ● ● ○ ●	○ ○ ● ○ ○ ●	○ ○ ● ○ ● ●
Braille Cell	2-3	2-5	2-5-6	2-6	2-3-6
Keys corresponding to Braille cell	D-S	D-K	D-K-L	D-L	D-S-L
	in	was	ea	ff	gg
Braille code	○ ○ ○ ● ● ○	○ ● ● ● ○ ○	○ ○ ● ○ ○ ○	○ ○ ● ● ● ○	○ ○ ● ● ● ●
Braille Cell	3-5	2-4-5	2	2-3-5	2-3-5-6
Keys corresponding to Braille cell	s-k	d-j-k	d	d-s-k	d-s-k-l

## Dot 5 Initial Letter (22 words)

	Abbreviation-Dot 5 + Initial Letter				
	day	ever	father	mother	right
Braille code	○ ○ ● ● ○ ● ○ ● ○ ○ ○ ○	○ ○ ● ○ ○ ● ○ ● ○ ○ ○ ○	○ ○ ● ● ○ ● ● ○ ○ ○ ○ ○	○ ○ ● ● ○ ● ○ ○ ○ ○ ● ○	○ ○ ● ○ ○ ● ● ● ○ ○ ● ○
Braille Cell	5, 1-4-5	5, 1-5	5, 1-2-4	5, 1-3-4	5, 1-2-3-5
Keys corresponding to Braille cell	K,F-J-K	K,F-K	K,F-D-J	K,F-S-J	K,F-D-S-K
	work	character	question	some	time
Braille code	○ ○ ○ ● ○ ● ● ● ○ ○ ○ ●	○ ○ ● ○ ○ ● ○ ○ ○ ○ ○ ●	○ ○ ● ● ○ ● ● ● ○ ○ ● ○	○ ○ ○ ● ○ ● ● ○ ○ ○ ● ○	○ ○ ○ ● ○ ● ● ● ○ ○ ● ○
Braille Cell	5, 2-4-5-6	5, 1-6	5,1-2-3-4-5	5,2-3-4	5,2-3-4-5
Keys corresponding to Braille cell	K,D-J-K-L	K,F-L	K ,F-D-S-J-K	K ,D-S-J	K, D-S-J-K
	under	young	where	name	one
Braille code	○ ○ ● ○ ○ ● ○ ○ ○ ○ ● ●	○ ○ ● ● ○ ● ○ ● ○ ○ ● ●	○ ○ ● ○ ○ ● ○ ● ○ ○ ○ ●	○ ○ ● ● ○ ● ○ ● ○ ○ ● ○	○ ○ ● ○ ○ ● ○ ● ○ ○ ● ○
Braille Cell	5,1-3-6	5,1-3-4-5-6	5,1-5-6	5,1-3-4-5	5,1-3-5
Keys corresponding to Braille cell	K, F-S-L	K ,F-S-J-K-L	K,F-K-L	K ,F-S-J-K	K ,F-S-K
	part	question	some	time	under
Braille code	○ ○ ● ● ○ ● ● ○ ○ ○ ● ○	○ ○ ● ● ○ ● ● ● ○ ○ ● ○	○ ○ ○ ● ○ ● ● ○ ○ ○ ● ○	○ ○ ○ ● ○ ● ● ● ○ ○ ● ○	○ ○ ● ○ ○ ● ○ ○ ○ ○ ● ●
Braille Cell	5,1-2-3-4	5,1-2-3-4-5	5,2-3-4	5,2-3-4-5	5,1-3-6
Keys corresponding to Braille cell	K ,F-D-S-J	K ,F-D-S-J-K	K ,D-S-J	K, D-S-J-K	K, F-S-L
	young	where			
Braille code	○ ○ ● ● ○ ● ○ ● ○ ○ ● ●	○ ○ ● ○ ○ ● ○ ● ○ ○ ○ ●			
Braille Cell	5,1-3-4-5-6	5,1-5-6			
Keys corresponding to Braille cell	K ,F-S-J-K-L	K,F-K-L			

**Dot 4-5 Initial Letter (5 words)**

	<b>Abbreviation-Dot 5 + Initial Letter</b>				
	<b>these</b>	<b>those</b>	<b>upon</b>	<b>whose</b>	<b>word</b>
Braille code	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠
Braille Cell	4-5, 2-3-4-6	4-5, 1-4-5-6	4-5, 1-3-6	4-5, 1-5-6	4-5, 2-4-5-6
Keys corresponding to Braille cell	J-K,D-S-J-L	J-K,F-J-K-L	J-K,F-S-L	J-K,F-S-L	J-K,D-J-K-L

**Dot 5 - 6 Initial Letter (6 words)**

	<b>Abbreviation</b>		
	<b>cannot</b>	<b>had</b>	<b>many</b>
Braille Code	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠
Braille Cell	4-5-6, 1-4	4-5-6, 1-2-5	4-5-6, 1-3-4
Keys corresponding to Braille cell	J-K-L,F-J	J-K-L,F-D-K	J-K-L,F-S-J
	<b>spirit</b>	<b>their</b>	<b>world</b>
Braille Code	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠
Braille Cell	4-5-6, 2-3-4	4-5-6, 2-3-4-6	4-5-6, 2-4-5-6
Keys corresponding to Braille Cell	J-K-L,D-S-J	J-K-L,D-S-J-L	J-K-L,D-J-K-L

**Final Letter (12 words)**

	<b>Abbreviation</b>			
	<b>-ance</b>	<b>-less</b>	<b>-sion</b>	<b>-ful</b>
Braille Code	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠
Braille Cell	4-6, 1-5	4-6, 2-3-4	4-6, 1-3-4-5	5-6, 1-2-3
Keys corresponding to Braille cell	J-L,F-K	J-L,D-S-J	J-L,F-S-J-K	J-L,F-D-S
	<b>-tion</b>	<b>-ment</b>	<b>-ity</b>	<b>-ness</b>
Braille Code	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠	⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠ ⠠
Braille Cell	5-6, 1-3-4-5	5-6, 2-3-4-5	5-6, 1-3-4-5-6	5-6,2-3-4
Keys corresponding to Braille Cell	J-L,F-S-J-K	J-L,D-S-J-K	J-L,F-S-J-K-L	K-L, D-S-J

	<b>-ound</b>	<b>-ount</b>	<b>-ence</b>	<b>-ong</b>
Braille Code	○ ● ● ● ○ ○ ○ ● ○ ● ○ ○	○ ● ○ ● ○ ○ ● ● ○ ● ● ○	○ ○ ● ○ ○ ● ○ ● ○ ● ○ ○	○ ○ ● ● ○ ● ● ● ○ ● ○ ○
Braille Cell	4-6,1-4-5	4-6,2-3-4-5	5-6,1-5	5-6,1-2-4-5
Keys corresponding to Braille Cell	j-l, f-j-k	j-l, d-s-j-k	k-l, f-k	k-l, f-d-j-k

**Short Forms (75 words)**

	<b>Abbreviation</b>		
	<b>about</b>	<b>above</b>	<b>afternoon</b>
Braille code	● ○ ● ○ ○ ○ ● ○ ○ ○ ○ ○	● ○ ● ○ ● ○ ○ ○ ● ○ ● ○ ○ ○ ○ ○ ● ●	● ○ ● ● ● ● ○ ○ ● ○ ○ ● ○ ○ ○ ○ ● ○
Braille Cell	1, 1-2	1, 1-2, 1-2-3-6	1, 1-2-4, 1-3-4-5
Keys corresponding to Braille cell	F,F-D	F,F-D,F-D-S-L	F,F-D-J,F-S-J-K
	<b>blind</b>	<b>braille</b>	<b>conceiving</b>
Braille code	● ○ ● ○ ● ○ ● ○ ○ ○ ● ○	● ○ ● ○ ● ○ ● ○ ● ● ● ○ ○ ○ ● ○ ● ○	○ ○ ● ● ● ○ ● ● ● ● ○ ○ ● ○ ● ● ○ ○ ○ ○ ● ● ○ ○
Braille Cell	1-2, 1-2-3	1-2, 1-2-3-5, 1-2-3	2-5, 1-4, 1-2-3-6, 1-2-4-5
Keys corresponding to Braille cell	f-d,f-d-s	f-d,f-d-s-k,f-d-s	d-k,f-j,f-d-s-l,f-d-j-k
	<b>according</b>	<b>across</b>	<b>after</b>
Braille code	● ○ ● ● ○ ○ ○ ○ ○ ○ ○ ○	● ○ ● ● ● ○ ○ ○ ○ ○ ● ● ○ ○ ○ ○ ● ○	● ○ ● ● ○ ○ ● ○ ○ ○ ○ ○
Alphabet word sign	a,c	a,c,r	a,f
Braille cell	1,1-4	1,1-4,1-2-3-5	1,1-2-4
Keys corresponding to Braille cell	F, F-J	F, F-J, F-D-S-K	F, F-D-J
	<b>afterward</b>	<b>again</b>	<b>against</b>
Braille code	● ○ ● ● ○ ● ○ ○ ● ○ ● ● ○ ○ ○ ○ ○ ●	● ○ ● ● ○ ○ ● ● ○ ○ ○ ○	● ○ ● ● ○ ● ○ ○ ● ● ○ ○ ○ ○ ○ ○ ● ○
Alphabet word sign	a,f,w	a.g	a.g.,st
Braille cell	1,1-2-4,2-4-5-6	1,1-2-4-5	1,1-2-4-5,3-4
Keys corresponding to Braille cell	F, F-D-J, D-J-K-L	F, F-D-J-K	F, F-D-J-K, S-J

	<b>almost</b>	<b>already</b>	<b>also</b>
Braille code			
Alphabet word sign	a,l,m	a,l,r	a,l
Braille cell	1,1-2-3,1-3-4	1,1-2-3,1-2-3-5	1,1-2-3
Keys corresponding to Braille cell	F, F-D-S ,F-S-J	F ,F-D-S, F-D-S-K	F ,F-D-S
	<b>although</b>	<b>altogether</b>	<b>always</b>
Braille code			
Alphabet word sign	a,l,th	a,l,t	a,l,w
Braille cell	1,1-2-3,1-4-5-6	1,1-2-3,2-3-4-5	1,1-2-3,2-4-5-6
Keys corresponding to Braille cell	F, F-D-S ,F-J-K-L	F ,F-D-S, D-S-J-K	F ,F-D-S, D-J-K-L
	<b>because</b>	<b>before</b>	<b>behind</b>
Braille code			
Alphabet word sign	Lower b,c	Lower b,f	Lower b,h
Braille cell	2-3,1-4	2-3,1-2-4	2-3,1-2-5
Keys corresponding to Braille cell	D-S, F-J	D-S, F-D-J	D-S ,F-D-K
	<b>below</b>	<b>beneath</b>	<b>beside</b>
Braille code			
Alphabet word sign	Lower b,l	Lower b,n	Lower b,s
Braille cell	2-3,1-2-3	2-3,1-3-4-5	2-3,2-3-4
Keys corresponding to Braille cell	D-S,F-D-S	D-S, F-S-J-K	D-S, D-S-J
	<b>between</b>	<b>beyond</b>	<b>children</b>
Braille code			
Alphabet word sign	Lowerb,t	Lowerb,y	ch,n
Braille cell	2-3,2-3-4-5	2-3,1-3-4-5-6	1-6,1-3-4-5
Keys	D-S ,D-S-J-K	D-S, F-S-J-K-L	F-L ,F-S-J-K

corresponding to Braille cell			
	conceive	could	deceive
Braille code			
Braille cell	2-5,1-4,1-2-3-6	1-4,1-4-5	1-4-5,1-4,1-2-3-6
Keys corresponding to Braille cell	D-K ,F-J, F-D-S-L	F-J ,F-J-K	F-J-K ,F-J, F-D-S-L
	<b>deceiving</b>	<b>declare</b>	<b>declaring</b>
Braille code			
Alphabet word sign	d,c,v,g	d,c,l	d,c,l,g
Braille cell	1-4-5,1-4,1-2-3-6,1-2-4-5	1-4-5,1-4,1-2-3	1-4-5,1-4,1-2-3,1-2-4-5
Keys corresponding to Braille cell	F-J-K, F-J ,F-D-S-L, F-D-J-K	F-J-K ,F-J, F-D-S	F-J-K ,F-J, F-D-S, F-D-J-K
	<b>either</b>	<b>first</b>	<b>friend</b>
Braille code			
Alphabet word sign	e,i	f,st	f,r
Braille cell	1-5,2-4	1-2-4,3-4	1-2-4,1-2-3-5
Keys corresponding to Braille cell	f-k ,d-j	f-d-j, s-j	f-d-j, sf-d-s-k
	<b>good</b>	<b>great</b>	<b>herself</b>
Braille code			
Alphabet word sign	g,d	g,r,t	
Braille cell	1-2-4-5,1-4-5	1-2-4-5,1-2-3-5,2-3-4-5	1-2-5,1-2-4-5-6,1-2-4
Keys corresponding to Braille cell	F-D-J-K ,F-J-K	F-D-J-K,F-D-S-K ,D-S-K	F-D-K, F-D-J-K-L, F-D-J
	<b>him</b>	<b>himself</b>	<b>immediate</b>
Braille code			
Braille cell	1-2-5,1-3-4	1-2-5,1-3-4,1-2-4	2-4,1-3-4,1-3-4
Keys corresponding to	F-D-K, F-S-J	F-D-K, F-S-J, F-D-J	D-J ,F-S-J, F-S-J

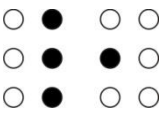
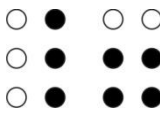
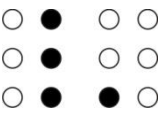
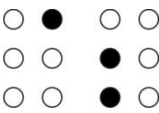
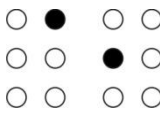
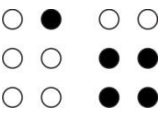
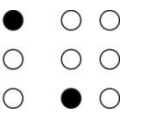
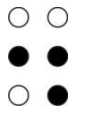
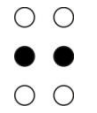
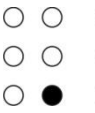
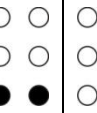
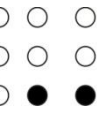
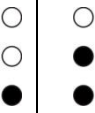
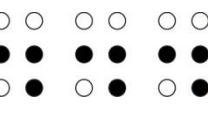
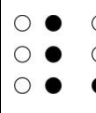
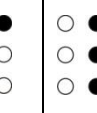
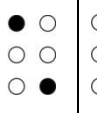
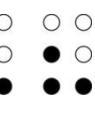
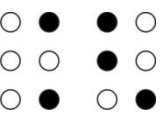
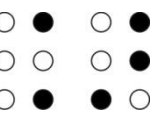
Braille cell			
	<b>its</b>	<b>itself</b>	<b>letter</b>
Braille code	⠠⠊⠎	⠠⠊⠞⠎	⠠⠇⠑⠞⠞⠑⠗
Alphabet word sign	x,s	x,f	l,r
Braille cell	1-3-4-6,2-3-4	1-3-4-6,1-2-4	1-2-3,1-2-3-5
Keys corresponding to Braille cell	F-S-J-L, D-S-J	F-S-J-L, F-D-J	F-D-S, F-D-S-K
	<b>little</b>	<b>much</b>	<b>must</b>
Braille code	⠠⠇⠊⠞⠞⠑	⠠⠇⠑⠞⠞⠑	⠠⠇⠑⠞⠞⠑
Alphabet word sign	l,l	m,ch	m,st
Braille cell	1-2-3,1-2-3	1-3-4,1-6	1-3-4,3-4
Keys corresponding to Braille cell	F-D-S, F-D-S	F-S-J, F-L	F-S-J, S-J
	<b>myself</b>	<b>necessary</b>	<b>neither</b>
Braille code	⠠⠇⠑⠞⠞⠑	⠠⠇⠑⠞⠞⠑	⠠⠇⠑⠞⠞⠑
Alphabet word sign	m,y,f	n,e,c	n,e,i
Braille cell	1-3-4,1-3-4-5-6,1-2-4	1-3-4-5,1-5,1-4	1-3-4-5,1-5,2-4
Keys corresponding to Braille cell	F-S-J, F-S-J-K-L, F-D-J	F-S-J-K, F-K, F-J	F-S-J-K, F-K, D-J
	<b>oneself</b>	<b>ourselves</b>	<b>paid</b>
Braille code	⠠⠇⠑⠞⠞⠑	⠠⠇⠑⠞⠞⠑	⠠⠇⠑⠞⠞⠑
Alphabet word sign	O,n,e,f	ou,r,v,s	p,d
Braille cell	5,1-3-5,1-2-4	1-2-5-6,1-2-3-5,1-2-3-6,2-3-4	1-2-3-4,1-4-5
Keys corresponding to Braille cell	K, F-S-K, F-D-J	F-D-K-L, F-D-S-K, F-D-S-L, D-S-J	F-D-S-J, F-J-K
	<b>perceive</b>	<b>perceiving</b>	<b>perhaps</b>
Braille code	⠠⠇⠑⠞⠞⠑	⠠⠇⠑⠞⠞⠑	⠠⠇⠑⠞⠞⠑
Alphabet word sign	p,er,c,v	p,er,c,v,g	p,er,h
Braille cell	1-2-3-4,1-2-4-5-6,1-	1-2-3-4,1-2-4-5-6,1-4,1-	1-2-3-4,1-2-4-5-6,1-2-

	4,1-2-3-6	2-3-6,1-2-4-5	5
Keys corresponding to Braille cell	F-D-S-J, F-D-J-K-L, F-J, F-D-S-L	F-D-S-J, , F-D-J-K-L, F-J, F-D-S-L, F-D-J-K	F-D-S-J, F-D-J-K-L, F-D-K
	quick	receive	receiving
Braille code	⠠⠠⠠⠠	⠠⠠⠠⠠⠠⠠	⠠⠠⠠⠠⠠⠠⠠
Alphabet word sign	q.k	r,c,v	r,c,v,g
Braille cell	1-2-3-4-5,1-3	1-2-3-5,1-4,1-2-3-6	1-2-3-5,1-4,1-2-3-6,1-2-4-5
Keys corresponding to Braille cell	F-D-S-J-K ,F-S	F-D-S-K ,F-J, F-D-S-L	F-D-S-K, F-J, F-D-S-L, F-D-J-K
	rejoice	rejoicing	said
Braille code	⠠⠠⠠⠠⠠⠠	⠠⠠⠠⠠⠠⠠⠠⠠	⠠⠠⠠⠠
Alphabet word sign	r,j,c	r,j,c,g	s,d
Braille cell	1-2-3-5,2-4-5,1-4	1-2-3-5,2-4-5,1-4,1-2-4-5	2-3-4,1-4-5
Keys corresponding to Braille cell	f-d-s-k, d-j-k ,f-j	f-d-s-k ,d-j-k ,f-j, f-d-j-k	d-s-j ,f-j-k
	should	such	themselves
Braille code	⠠⠠⠠⠠	⠠⠠⠠⠠	⠠⠠⠠⠠⠠⠠⠠⠠
Alphabet word sign	sh,d	s,ch	the,m,v,s
Braille cell	1-4-6,1-4-5	2-3-4,1-6	2-3-4-6,1-3-4,1-2-3-6,2-3-4
Keys corresponding to Braille cell	F-J-L ,F-J-K	D-S-J, F-L	D-S-J-L, F-S-J, F-D-S-L ,D-S-J
	thyslf	today	together
Braille code	⠠⠠⠠⠠⠠⠠	⠠⠠⠠⠠	⠠⠠⠠⠠⠠⠠⠠
Alphabet word sign	th,y,f	t,d	t,g,r
Braille cell	1-4-5-6,1-3-4-5-6,1-2-4	2-3-4-5,1-4-5	2-3-4-5,1-2-4-5,1-2-3-5
Keys corresponding to Braille cell	F-J-K-L, F-S-J-K-L	D-S-J-K, F-J-K	D-S-J-K, F-D-J-K ,F-D-S-K
	tomorrow	tonight	would
Braille code	⠠⠠⠠⠠⠠⠠	⠠⠠⠠⠠	⠠⠠⠠⠠

Alphabet word sign	t,m	t,n	w,d
Braille cell	2-3-4-5,1-3-4	2-3-4-5,1-3-4-5	2-4-5-6,1-4-5
Keys corresponding to Braille cell	D-S-J-K,F-S-J	D-S-J-K, F-S-J-K	D-J-K-L ,F-J-K
	your	yourself	yourselves
Braille code	● ● ● ○ ○ ● ● ● ● ● ● ○	● ● ● ○ ● ● ○ ● ● ● ● ○ ● ● ● ○ ○ ○	● ● ● ○ ● ○ ○ ● ○ ● ● ● ● ○ ● ○ ● ● ● ○ ● ● ● ○
Alphabet word sign	y,r	y,r,f	y,r,v,s
Braille cell	1-3-4-5-6,1-2-3-5	1-3-4-5-6,1-2-3-5,1-2-4	1-3-4-5-6,1-2-3-5,1-2-3-6,2-3-4
Keys corresponding to Braille cell	F-S-J-K-L, F-D-S-L	F-S-J-K-L, F-D-S-K, F-D-J	F-S-J-K-L, F-D-S-K, F-D-S-L, D-S-J

**Module Indicators**

	Abbreviation		
	cap.passage	cap.termin	gr.1 term
Braille code	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ● ○ ● ○ ●	○ ○ ○ ● ○ ○ ○ ○ ○ ● ○ ○	○ ○ ○ ○ ○ ● ○ ○ ○ ● ● ○
Braille cell	6,6,6	6,3	5-6,3
Keys corresponding to Braille cell	L, L, L	L, S	K-L, S
	symbol	word	passage
Braille code	○ ● ○ ○ ○ ○ ● ○ ○ ● ● ○	○ ● ○ ○ ○ ○ ● ○ ○ ● ○ ○	○ ● ○ ○ ○ ○ ● ● ○ ● ● ●
Braille cell	4-6,2-3	4-6,2	4-6,2-3-5-6
Keys corresponding to Braille cell	J-L, D-S	J-L,D	J-L, D-S-K-L
	Abbreviation		
	terminator	symbol	word
Braille code	○ ● ○ ○ ○ ○ ○ ○ ○ ● ● ○	○ ● ○ ○ ○ ● ● ○ ○ ○ ● ○	○ ● ○ ○ ○ ● ● ○ ○ ○ ○ ○
Braille cell	4-6,3	4-5,2-3	4-5,2
Keys corresponding to Braille cell	J-L, S	J-K, D-S	J-K, D
	passage	terminator	symbol
Braille code	○ ● ○ ○ ○ ● ● ● ○ ○ ● ●	○ ● ○ ○ ○ ● ○ ○ ○ ○ ● ○	○ ● ○ ○ ○ ● ● ○ ○ ● ● ○
Alphabet word sign			
Braille cell	4-5,2-3-5-6	4-5,3	4-5-6,2-3

Keys corresponding to Braille cell	J-K, D-S-K-L		J-K ,S		J-K-L, D-S	
	<b>Abbreviation</b>					
	<b>word</b>		<b>passage</b>		<b>terminator</b>	
Braille code						
Braille cell	4-5-6,2		4-5-6,2-3-5-6		4-5-6,3	
Keys corresponding to Braille cell	J-K-L, D		J-K-L, D-S-K-L		J-K-L, S	
	<b>symbol</b>		<b>word</b>		<b>passage</b>	
Braille code						
Braille cell	4,2-3		4,2		4,2-3-5-6	
Keys corresponding to Braille cell	J, D-S		J, D		J, D-S-K-L	
	<b>terminator</b>					
Braille code						
Alphabet word sign						
Braille cell	4,3					
Keys corresponding to Braille cell	J,S					
	<b>period</b>	<b>colon</b>	<b>dash</b>	<b>lg dash</b>	<b>exclam</b>	<b>hyphen</b>
Braille code						
Braille cell	2-5-6	2,5	6,3-6	5,6,3-6	2-3-5	3-6
Keys corresponding to Braille cell	D-K-L	D-K	L,S-L	K,L,S-L	D-S-K	S-L
	<b>ellipsis..</b>		<b>slash</b>	<b>slash</b>	<b>inner q</b>	<b>outer q</b>
Braille code						
Braille cell	2-5-6,2-5-6,2-5-6		4-5-6,3-4	4-5-6,1-6	6,2-3-6	6,3-5-6
Keys corresponding to Braille cell	D-K-L,D-K-L,D-K-L		J-K-L,S-J	J-K-L,F-L	L,D-S-L	L,S-K-L
	<b>[</b>		<b>]</b>			
Braille code						
Braille cell	4-6,1-2-6		4-6,3-4-5			
Keys corresponding to Braille cell	j-l,f-d-l		j-l,s-j-k			

## APPENDIX V

## INSTITUTIONAL HUMAN ETHICAL COMMITTEE CLEARANCE CERTIFICATE

## INSTITUTIONAL HUMAN ETHICS COMMITTEE

**Avinashilingam**

Institute for Home Science and Higher Education for Women  
(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3  
of UGC Act 1956) Re-accredited with 'A+' Grade by NAAC.  
Recognised by UGC Under Section 12 B  
Coimbatore-641 043, Tamil Nadu, India

**Chairman**

Dr. Sudha Ramalingam  
Director-Research & Innovation,  
Professor-Community Medicine,  
PSG Institute of Medical Sciences  
& Research, Coimbatore

**Member Secretary**

Dr.S.Uma Mageshwari  
Professor and Head,  
Department of Food Service  
Management & Dietetics

**Members**

Mr. K.Arulmoli (Legal Expert)  
Dr.Subhashini K. Sripathi  
Dr.A.Saraswathy (Medical Officer)  
Ms.D.Kavitha  
Dr.A.R.Sudamani Ramasamy  
Dr.G.Victoria Naomi  
Dr. Judith Justin  
Dr.Anitha Subash

14<sup>th</sup> December, 2021

To  
Ms./Mrs.R.Vaijayanthi  
Department of Education  
Avinashilingam Institute for Home Science and  
Higher Education for Women  
Coimbatore – 641 043

Dear Vaijayanthi R,

Ref: Your presentation of the proposal No. IHEC/18-19/EDU/04 entitled "Effect of Tech Aided Grade 2 Braille Tutoring System for Students with Visual Impairment"- Full House Presentation on 27<sup>th</sup> November 2019.

The approval for the above study was kept pending for submission of the consent form from Children, communicated to you on 29th November 2019.

You have submitted the pending document of the Informed Consent Form from the children on 10.11.21 for the study and in lieu of this, the Institutional Human Ethics Committee of our University hereby grants approval to your research proposal No. IHEC/18-19/EDU/04 entitled "Effect of Tech Aided Grade 2 Braille Tutoring System for Students with Visual Impairment" submitted by you. The Approval number for the same is AUW/IHEC/EDU-19-20/FHP-03.

Regards,

*S. Uma Mageshwari*  
Dr.S.Uma Mageshwari  
Member Secretary



## ANNEXURE VI

## PLAGIARISM REPORT



**Avinashilingam Institute for Home Science and Higher Education for Women**

(Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD)  
Re-accredited with 'A++' Grade by NAAC. Recognised by UGC Under Section 12 B  
Coimbatore - 641 043, Tamil Nadu, India

**PLAGIARISM CHECK REPORT (THESES)**

1.	Name of the Research Scholar	R. Vijayanthi
2.	Roll No. and Year of Registration	17PHEDP002, 2017
3.	Department	Education
4.	Name of the Research Guide	Dr. G. Victoria Naomi
5.	Title of the Thesis / Dissertation	Effect of Tech Aided Grade 2 Braille (TAG2B) Tutoring System for Students with Visual Impairment
6.	Similarity Content (%) Identified	<b>6%</b>
7.	Software Used	Turnitin
8.	Date of Verification	28-02-2022

**Note :** The report is excluding 14 Consecutive words, Review of Literature and Quoted Materials.

Checked by :

  
28/2/22  
**Information Scientist**

  
**Research Scholar**

  
28.02.2022  
**Assistant Librarian**

  
**Research Guide**

Date: 28-02-2022

# Learning Medium for Students with Visual Impairment

R.Vaijyanthi<sup>1</sup>, Prof.G.Victoria Naomi<sup>2</sup>

<sup>1</sup>Asst Professor, Aviashilingam Institute for Home Science and Higher Education for Women, Coimbatore

<sup>2</sup>Professor & HOD of Special Education, Aviashilingam Institute for Home Science and Higher Education for Women, Coimbatore

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## Abstract

Students with Visual impairment benefit from building a strong foundation of literacy skills during their preschool years, a goal that is often more challenging for young Braille readers who lack access to the incidental learning readily absorbed by typically sighted children. Braille remains the main medium of communication for persons who are blind. The Disability Act of 2003, USA on its part stipulated that Learning Institutions should take into account the special needs for persons with disabilities with respect to the entry requirements, pass marks, curriculum, examinations, auxiliary services, use of school facilities, class schedules and other similar considerations. The Act also emphasized that provisions should be made in all parts of the country for an integrated system of special and non formal education for persons with all forms of disabilities. It also proposed for the establishment where possible of Braille and recorded libraries for persons with visual impairments. Keeping these points in view an attempt was done to know the Braille literacy medium for students with visual impairment. The objectives of the study were to examine the learning medium of students with visual impairment in Inclusive and Special schools and to find out the appropriate educational devices used by visually impaired students. Survey method was used to gather the details. The study was carried out with Ninety four students with visual impairment and thirty five special teachers. Qualitative analysis was done to analyze the learning medium for students with visual impairment. Results revealed that majority of the samples(77.66%) were students with Low vision than totally blind students(22.34% . The study revealed that students with visual impairment use book print ,print& audio ,reader service, digital/recorded books , audio tapes/speech input, large print with/without the aid of magnifiers as their learning medium. Nearly 52.38% of 21 totally visually impaired students used Braille as learning medium.

## Introduction

Learning medium presents multiple challenges for teachers of students with visual impairments , classroom teachers, educational assistants, students' with visual impairments, and for their family members. As the braille code has evolved over the years so does the instructional braille method. The choice of instructional braille method depends on several factors, for example the degree of vision loss, learning styles, needs, and capabilities of students with visual impairments so does the instructional braille method.

Martos (2006) noted that literacy skills are equally important for people with visual impairments. According to the National Braille Press, Boston "there is no substitute for the ability to read other than braille. For people who are blind, braille is an essential tool that aids in the process of becoming literate.

Learning braille also develops self-confidence among students' as they acquire new skills. As students with low vision are encouraged to scribble on paper to practise their

writing skills, young students who learn braille should also be encouraged to scribble on their braille writer, imitating the braille writing.

Students with Low vision use low vision devices such as magnifiers, monoculars, telescopes, and video magnifiers to enhance their ability to read and write visually.

### Need for the Study

Learning medium of totally vision impaired persons is obviously braille though technology play a role to deprive visually impaired persons using Braille. But Braille cannot be substituted by any other mode of learning. Braille is an essential component of any educational program serving students who are visually impaired. Students with total blindness may learn better through a tactile mode and thus braille may be recommended, while students with low vision have sufficient vision to learn to read print. Still others may benefit from dual media, in which they learn both print and braille. Hence an attempt was made in this study to find out the learning medium of students with blindness and Low vision.

The objectives of the study were to

1. examine the learning medium of students with visual impairment in Inclusive and Special schools
2. find out the appropriate educational devices used by visually impaired students in Inclusive and Special schools

### Method of Study

Survey method was used to gather the details of learning medium of students with visual impairment. The Special teachers working for the students with visual impairment were used to collect the data. There were Ninety four students with visual impairment under these 35 special teachers at primary, secondary and higher secondary levels. The students and teachers were from Coimbatore, Erode, Salem, Tirupur, Karur and Dharmapuri districts of Tamil Nadu, India. Questionnaire was prepared to get the demographic details of the students with visual impairment and special teachers. In addition a check list with twelve Yes/No statements was used to examine the learning medium of student with visual impairment.

### Analysis and Interpretation

The sample comprised of twenty one students with total blindness and seventy three students with Low Vision. Qualitative Analysis were used and tabulated as follows.

The findings of the study is discussed as follows

#### 1. Demographic details of students with visual impairment.

**Table 1: Details of the students with Visual Impairment**

Variables	Type	Totally Blind(n=21)	%	Low Vision (n=73)	%
Gender	Boys	6	28.57	32	43.84
	Girls	15	71.43	41	56.16
Class	Primary	6	28.57	7	9.59
	Secondary	14	66.67	55	75.34
	Higher secondary	1	4.76	11	15.07
Locality	Rural	10	47.62	38	52.05
	Urban	11	52.38	33	45.21

Type of residence	Day scholar	9	42.86	63	86.30
	Hostel	12	57.14	10	13.70
Type of school	Inclusive	11	52.38	73	100.00
	Special	10	47.62	0	0.00
Academic achievement	Good	16	76.19	65	89.04
	Average	5	23.81	8	34.78

It can be discussed from the above table that a majority of the students (77.66%) were students with Low vision than totally blind students(22.34%). Among the students with total blindness, girls were comparatively more (71.43%) when compared to boys with total blindness(28.57%). Among the students with Low vision girls (56.16%) were comparatively more than boys with low vision (43.84%).

A majority of the students with Low vision (75.34%)and totally blind students(66.67) belonged to secondary level. Students with total blindness at primary level were28.57% and more when compared to students with low vision(9.57%)and at higher secondary level, the students with low vision were more(15.07%) compared to students with total blindness(4.76%)

There were equal percentage of distribution of the samples in urban(49.79%) and rural areas(49.83%).

A majority of the students with Low vision were day scholars (86.30)as against totally blind students (57.14)who stayed in hostel. All the students with low vision were in the inclusive school set up and 52.38% of students with total blindness were in special schools.

A majority of the students with low vision were good in their academic performance (89.04%) than students with total blindness(76.19) and only 35percent of the students with low vision were average in their studies compared to students with total blindness(23.81)

## 2. Details of Resource teachers

**Table 2: Details of Teachers (N=35)**

Variables	Type	Response	Percentage
Gender	Male	0	0
	Female	35	100.00
Class handled	Primary	5	14.29
	High school	20	57.14
	Higher secondary	15	42.86
Number of students	Totally blind	10	28.57
	Low vision	25	71.42
Years of experience	1-5	3	8.57
	6-10	8	22.86
	11-15	14	40.00
	16-20	10	28.57
Qualification	B.a/b. Sc	2	5.71
	M.a/m. Sc	3	8.57
	B.a/b. Sc with b. Ed	28	80.00
	M.a/m. Sc with m. Ed	2	5.71
	Diploma	0	0.00
Income	20,000-25,000	35	100.00
Rci registered		30	85.71

Cent percent of the resource teachers were female teachers. More than fifty percent of the teachers handled students at high school level and 42.86% of teachers handled students at

higher secondary level. The majority of the teachers (71.42%) handled students with low vision than students with total blindness(28.57%).

Forty percent of the teachers had 11-15 years of teaching experience followed by teachers with 16-20 years and 22.86% of teachers with 6-10years of teaching experience. About 80% of teachers were undergraduates with B Ed and few were Post graduates. Above 80% of the teachers were registered with RCI. Cent percent of the teachers had an income of Rs 20,000-25,000.

### 3. Learning Medium of Students with Visual Impairment

The study comprised of 94 students with visual impairment of which 13 students were at the primary level,69 students were at the secondary level and 12 students were at the Higher secondary level.

**Table 3: Learning Medium of Students with Visual Impairment**

S. N	Learning medium	Primary(N=13)				Secondary(N=69)				Higher secondary(N=12)			
		T.B N=6	%	N=7	%	T.B N=14	%	L.V N=55	%	N=1	%	L.V N=11	%
1	Braille	3	50	-	-	7	50	-	-	1	100	-	-
2	Large Print with aid of magnifiers	-	-	3	42.85	-	-	20	36.36	-	-	4	33.33
3	Large Print without aid of magnifiers	-	-	4	57.14	-	-	35	63.63	-	-	7	58.33
4	Book Print	-	-	7	100	-	-	55	100	-	-	11	100
5	Braille & Print	3	50	-	-	-	-	-	-	-	-	-	-
6	Braille & Audio	3	50	-	-	7	50	-	-	1	100	-	-
7	Print & Audio	-	-	7	100	-	-	55	100	-	-	-	-
8	Reader service	6	100	7	100	14	100	55	100	1	100	11	100
9	Computer with large character display	-	-	-	-	-	-	20	36.36	-	-	2	16.66
10	Computer with voice synthesis	-	-	-	-	-	-	10	18.18	-	-	4	33.33
11	Digital/recorded books	6	100	7	100	14	100	30	54.54	1	100	11	100
12	Audio tapes/speech input	6	100	7	100	14	100	45	81.81	1	100	11	100

It can be interpreted from the above table that all the students with total blindness at the primary used reader service, digital/recorded books and audio tapes/speech input. About 57% percent of them used braille & print and Braille& audio .Only 33.33 percent of the totally blind students were using Braille at the primary school level.

Cent percent of the totally blind students at the secondary level used reader service, digital/recorded books and audio tapes/speech input followed by fifty percent of them used Braille and Braille & Audio. It was alarming to note that none of the students at primary and secondary level used Computer with large character display and Computer with voice synthesis. cent percent of the totally blind students at the higher secondary level used Braille, reader service, digital/recorded books and audio tapes/speech input.

Cent percent of the students with Low vision at the primary level used book print ,print& audio ,reader service, digital/recorded books and audio tapes/speech input. Around 57percent of students with Low vision at the secondary level used Large Print without aid of magnifiers and42 percent of them used Large Print with the aid of magnifiers. Cent percent of the students with Low vision at the secondary level used book print ,print& audio and reader service, .Around 63.63 percent of students with Low vision at the secondary level used Large Print without aid of magnifiers and36.36 percent of them used Large Print with the aid of magnifiers.

Approximately eighty one percent of the students with low vision used audio tapes/speech input and 54.54 used digital/recorded books. Less than forty percent of the students with Low vision used computers as their literacy medium. . Cent percent of the students with Low vision at the higher secondary level used book print ,print& audio reader service, audio tapes/speech input and digital/recorded books. .Around 58.33 percent of students with Low vision at the secondary level used Large Print without aid of magnifiers and33.33percent of them used Large Print with the aid of magnifiers. Less than forty percent of the students with Low vision used computers as their literacy medium.

### **Results and Findings**

The major results and findings of the study are as follows:

1. A majority of the students(77.66%) were students with Low vision than totally blind students(22.34%). Among the students with total blindness ,girls were comparatively more (71.43%) when compared to boys with total blindness(28.57%). The students with Low vision girls (56.16%)were comparatively more when compared to boys with low vision (43.84%).
2. A majority of the students with Low vision (75.34%)and totally blind students(66.67) belonged to secondary level. Students with total blindness at primary level were28.57% and more when compared to students with low vision(9.57%)and at higher secondary level the students with low vision were more(15.07%) compared to students with total blindness(4.76%)
3. All the Special teachers were female teachers. More than fifty percent of the teachers handled students at high school level and 42.86% of teachers handled students at higher secondary level. The majority of the teachers(71.42%) handled students with low vision than students with total blindness(28.57%).Forty percent of the teachers had 11-15 years of teaching experience followed by teachers with 16-20 years and 22.86% of teachers with 6-10years of teaching experience.
4. Cent percent of the students with blindness at the secondary level used reader service, digital/recorded books . It was alarming to note that none of the students at primary and secondary level used Computer with large character display and Computer with voice synthesis audio tapes/speech input followed by fifty percent of them used Braille and Braille &Audio. cent percent of the totally blind students at the higher secondary level used Braille ,reader service, digital/recorded books and audio tapes/speech input.
5. Cent percent of the students with Low vision at the primary level used book print , print& audio ,reader service, digital/recorded books and audio tapes/speech input. Around 63.63 percent of students with Low vision at the secondary level used large print without aid of magnifiers and36.36 percent of them used Large Print with the aid of magnifiers.

### **Conclusion**

The study revealed that students with visual impairment use book print ,print& audio ,reader service, digital/recorded books , audio tapes/speech input, Large Print with/without the aid of magnifiers as their learning medium. Since these students are expected to develop

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competency skills which could facilitate their functional integration, learning Braille is essential and mandatory .It is also recommended by various policies that Education and, training should be in tune to provide Braille reading and writing to develop independence, freedom and confidence of the students with Visual Impairment. The special teachers should ensure that large print or braille texts, supplementary materials, educational aids and equipment are required for the visually impaired students so that the student's maximum participation is met in all classroom activities.

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**CHALLENGES IN LEARNING BRAILLE FOR LEARNERS WITH VISUAL  
IMPAIRMENT-PERCEPTION OF SPECIAL TEACHERS AND PARENTS**

**R. Vaijyanthi**, Asst. Professor, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. Email: vairangarajuu@gmail.com

**Prof. G. Victoria Naomi**, Professor & HOD of Special Education, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. Email: gvnaomi@gmail.com

**Abstract**

Literate individuals can excel in school and enter adulthood with a competitive advantage in employment and in life, which is not the case for individuals with low or no literacy skills. For Learners with visual impairment, literacy skills are equally significant. Although the manner in which learners with visual impairment acquire and develop these skills may vary, the goal is the same: to use reading, writing and other literacy tools to obtain and understand important information for their own benefit and that of others (Spungin, 2012). Braille is vital to all visually impaired individuals and it's the only system through which visually impaired children can learn to read and write, yet the rate of Braille literacy among visually impaired people belonging to developing countries including Tamil Nadu is alarmingly low. Visually impaired child also needs educational support from the parents and it is the responsibility of the parents to always keep the morale up of their visually impaired child in all situations and provide him/her a barrier free environment. Keeping these points in view an attempt was done to know the perception of special teachers and parents on challenges in learning Braille for learners with visual impairment. The objectives of the study were 1. To analyze the perceptions of special teachers and parents on challenges in Braille instruction for learners with visual impairment in Inclusive and Special schools and 2. To find out the use of Braille and assistive technology for learners with Visual Impairment. Survey method was used to gather the details. The study was carried out with thirty five Special teachers and twenty Parents of learners with visual impairment. Qualitative and quantitative analysis was done to analyze the perception of special teachers and parents of Learners with Visual Impairment. Results revealed that the Special teachers expressed that Learners with Visual Impairment use Print as an easier solution than attempting to provide Braille instruction and Braille material and the students were highly dependent on technology and the special teachers felt it as the major challenge faced by the learners with visual impairment. The Parents expressed that learner with visual impairment access to many of the same visual materials as her /his peers. The second challenge is that the parents felt that Braille is a valuable tool but needs to be taught during the early grades and deciding to teach Braille to a learner should be based on the individual needs of the child.

**Introduction**

Literate individuals can excel in school and enter adulthood with a competitive advantage in employment and in life, which is not the case for individuals with low or no literacy skills. For Learners with visual impairment, literacy skills are equally significant. Although the manner in which learners with visual impairment acquire and develop these skills may vary, the goal is the same: to use reading, writing and other literacy tools to obtain and understand important information for their own benefit and that of others (Spungin, 2012). Braille is vital to all visually impaired individuals and it's the only system through which visually impaired children can learn to read and write, yet the rate of Braille literacy among visually impaired people belonging to developing countries including Tamilnadu is alarmingly low. Ndung'u (2011) argues that, Braille will always be more than a medium of literacy for persons with visual impairment. It seeks to represent competence, independence and equality. Since its invention as a communication skill, Braille codes have been developed for many languages, covering a range of subject areas such as mathematics, music, computing, science, chess and knitting patterns. Braille is also incorporated into products such as clocks, watches and timers, games and maps. It is the primary tool for literacy available to people who are blind, deaf blind, or who have severe vision impairment.

*Review of literature*

Rodaina Khader AlTarawneh, Rabah Majali (2021) in their study on “**Effectiveness of a Braille Training Program for teachers**” in Jordan aimed to know the effectiveness of a braille training program for the teachers (15) in Jordan. The findings indicated that the program was effective, and it contributed to increasing teachers' knowledge about reading and writing braille.

Xiaomeng Chen, Lelin Liang and Minghui Lu (2021) in their study on “**Braille Reading Accuracy in Chinese Students with Visual Impairments: The Effects of Visual Status and Braille Reading Patterns**” explored the effects of visual status and braille reading patterns on the reading accuracy of students with visual impairments in China. The sample consisted of 121 students aged 10–19 years: 48 were students with congenital visual impairments, 25 were students with adventitious visual impairments, and 48 were sighted students. Students with visual impairment read braille and sighted students read printed materials, whilst both reading materials have same content. The participants' reading accuracy was measured by assessing the number and range of errors. The types of error identified included mispronunciation, omission, repetition, substitution, self-correction, and insertion. The study had two main conclusions. (1) Type of vision status had a significant effect on reading accuracy. More specifically, the reading accuracy of the sighted students was significantly higher than that of the students with visual impairments. Furthermore, repetition was the most common type of reading error made by the two groups of students with visual impairments, whereas self-correction was the most common type of reading error made by the sighted students. (2) Braille reading patterns had a marginally significant effect on reading accuracy. The participants who used cooperative and one-handed patterns were more accurate than the students who used the other braille reading patterns. Specifically, the participants using cooperative and one-handed patterns made significantly fewer mistakes in the repetition category than the students using marker and parallel patterns, but this difference did not exist for the other types of reading errors.

Serah Wanjai, Margaret Murugami, Beatrice Bunyasi (2021) conducted the study on “**Braille Literacy Levels Among Learners With Visual Impairment In Special Schools In Kenya**”. Effective education ensures that students are able to fully participate and benefit from it, regardless of whether they have impairments or not. Good vision is important for students at all stages of learning as it helps them reach their academic potential. It is paramount that students with visual impairment are proficient in Braille so that they are not disadvantaged academically since Braille remains their main medium of communication. Previous studies have ventured into academic performance of learners with visual impairment, however, nothing much is known about their Braille proficiency level. Braille reading tests were administered to forty-seven class eight and form four students in special schools for learners with visual impairments to establish their Braille literacy level. Semi structured interviews were used to solicit more information from four head teachers and a questionnaire used for sixteen teachers in the schools under study. Data was analyzed qualitatively along the common themes identified. The results established that Braille literacy level among primary school children was rather low. However, the case was quite different among high school students. There was no uniformity in the way schools arranged to teach their students Braille. Braille literacy could be improved if strategies were set to teach children with visual impairment Braille and ensure that they were proficient in it.

Suraj Singh Senjam (2019) in the study on “**Assistive Technology for People with Visual Loss**” quoted that Assistive technology for people with visual disability is growing rapidly over the past few years around the world. Such technology enhances the functioning and performance of daily living skills, thereby improves the independent living. These technologies range from low cost to high end and expensive which include mobility, reading, writing, daily living, and communication technologies.. The present paper highlights various type assistive technologies in which few of them incorporate with illustrations so the readers understand easily.

Dewi Juwita Susanti and Sari Rudyati (2018) emphasized that Student with visual impairment have special needs in the form of Braille to support their reading and writing skills. The ability to read and write Braille is a basic thing that must be mastered by student as the basic skill in the learning process. The purpose of this study to examine various ways to learn writing and reading Braille

include strategy, method, approach and media. This study was designed to do a systematic review method by analyzing 13 articles related to the topic by analyzing data using descriptive analysis. The results of the data analysis in this article focus on the Braille learning to teaching reading and writing Braille as basic asset in the learning process.

Ivy, Sarah & Guerra, Jennifer & Hatton, Deborah. (2017) in their on **Procedural Adaptations for Use of Constant Time Delay to Teach Highly Motivating Words to Beginning Braille Readers**". Constant time delay is an evidence-based practice to teach sight word recognition to students with a variety of disabilities. To date, two studies have documented its effectiveness for teaching braille. The Method adopted in this was a multiple-baseline design, which evaluated the effectiveness of constant time delay to teach highly motivating words to three beginning braille readers with developmental disabilities. Procedural variations included a pre-teaching and assessment tool, a higher criterion for mastery, an increased number of trials per session, and remediated instructional feedback. Results revealed that a functional relation was established for all three participants. Students reached mastery in four to 12 sessions in less than one hour of instruction. Although the number of correct responses decreased over time, long-term maintenance was demonstrated. It was discussed that constant time delay was a promising strategy for teaching highly motivating words to early braille readers and Replication was required to establish constant time delay as an evidence-based practice for braille literacy. Nannemann, Allison C.; Bruce, Susan M.; Hussey, Colleen; Vercollone, Becky S.; McCarthy, Mary (2017) in their study **"Oral Braille Reading Decoding Strategies of Middle School Students Who Are Blind or Have Low Vision"**. Students who are visually impaired may face unique literacy challenges as they learn to read and write braille. One such challenge relates to slower reading speeds for students who read braille as compared to those who read print. In addition to learning letters, sounds, grammar, and spelling, braille readers must learn contractions and composition signs and the rules for using such symbols. This extra hurdle influences the decoding skills of braille students. This study was conducted as collaborative action research, which involved two teachers of students with visual impairments and one university professor. The findings of this study yielded a number of implications for practice and further research that included: (1) Analysis of decoding errors and strategies utilized in designing individualized reading instruction, and (2) Focus more specifically on the types of errors that students make while reading. In addition, research should consider whether decoding and instructional strategies have a positive impact on reading.

Wandera Roberts Otyola, Grace Milly Kibanja, Anthony M. Mugagga (2017) conducted the study on **"Challenges Faced by Visually Impaired Students at Makerere and Kyambogo Universities"**. This study aimed at investigating the challenges faced by visually impaired students in Makerere and Kyambogo Universities. The study followed a cross-sectional survey design and involved 200 respondents (50 visually impaired students, 50 lecturers, 50 university administrators and 50 students who were not visually impaired). Data was collected using questionnaires, interviews and document review. The findings revealed that the visually impaired students receive bursaries and allowances from government and non-government organizations; meals, accommodation and scholastic materials from their universities; extra time during examinations; oral examinations; and buddy support. However, constraining limitations in the methods of instruction and assessment used and the instructional materials provided were noted. On the basis of these findings, recommendations towards the better education of the visually impaired students are made.

### *Need for the Study*

Though it is obvious that literacy is a key factor in determining success in life, including employment, it would appear that Braille literacy has declined dramatically in the past few decades and is now at a critically low level worldwide. Yet in spite of all this, Braille will remain relevant so long as print is relevant and is unlikely to be replaced by other technologies for the foreseeable future, since it is a foundational skill for literacy, numeracy and information access for people who are blind (Vision Australia, July, 2011). The present study was therefore conceptualized to analyze Parents and Special teachers' perceptions on factors influencing Braille literacy, grade I & grade II

Braille, Braille and print literacy for learners with low vision (dual media) and relationship between Braille and technology. Since learners who are blind achieve their literacy through Braille, knowledge of what Special teachers think and feel about Braille literacy in schools for learners with visual impairment is of paramount importance in addressing concerns about the decline in Braille in Tamil Nadu and beyond. Hence, an attempt was made to Know the parents and special teachers' views and feelings about the status of Braille literacy instruction in schools for learners with visual impairment is likely to enhance the quality of literacy through Braille and promise higher prospects for learners with visual impairment.

*Objectives* of the study were to

1. To analyze the perception of special teachers on challenges in Braille for learners with visual impairment.
2. To establish the perception of special teachers on teaching grade I and grade II English Braille code for learners with visual impairment.
3. To determine the perception of special teachers on provision of print and Braille for learners with visual impairment.
4. To find out perceptions of special teachers on the use of Braille and assistive technology for learners with visual impairment.
5. To analyze the perceptions of parents on challenges in learning Braille for their children with visual impairment.

### *Method of Study*

Survey method was used to gather the details of perceptions of Special teachers and Parents on challenges in learning Braille for their learners with visual impairment. The Special teachers and Parents of the learners with visual impairment were used to collect the data. There were thirty five special teachers and twenty parents of learners with visual impairment. The Parents and Special teachers were from Coimbatore, Erode, Salem, Tirupur, Karur and Dharmapuri districts of Tamil Nadu, India. Questionnaire was prepared to get the demographic details of the Special teachers and parents of learners with visual impairment. In addition a check list comprising of twelve statements with three point Likert's scale was used to analyze the challenges in Braille instruction for their learners with visual impairment.

### *Analysis and Interpretation*

The sample comprised of thirty five Special teachers and twenty parents of learners with visual impairment. Qualitative and quantitative Analysis were used and tabulated as follows.

#### **1. Demographic details of special teachers and parents of learners with visual impairment.**

Cent percent of the resource teachers were female teachers. More than fifty percent of the teachers handled students at high school level and 42.86% of teachers handled students at higher secondary level. Forty percent of the teachers had 11-15 years of teaching experience followed by teachers with 16-20 years and 22.86% of teachers with 6-10 years of teaching experience. About 80% of teachers were undergraduates with B Ed and few were Post graduates. Above 80% of the teachers were registered with RCI. This is in line with Kamunge (1998) who asserts that quality of teaching is determined by the level of academic professional qualification and training of a teacher in order to achieve objectives and policies of education. Cent percent of the teachers had an income of Rs 20,000-25,000. Majority of the parents (75%) were illiterates and twenty five percent were literates.

#### **2. Special teachers' Perception on Challenges in Braille literacy for learners with visual impairment**

To find the major challenge faced by Special teachers in providing braille literacy for learners with visual impairment, Weighted Average rank test was employed. The following table illustrates the result of the study.

**TABLE:1 CHALLENGES IN BRAILLE LITERACY-PERCEPTION OF SPECIAL TEACHERS**

Particulars	Agree	Neutral	Disagree	Total	Mean Score	Mean	Rank
Learners with VI use print as an easier solution than attempting to provide Braille instruction and Braille material	30	0	5	35	95	2.71	1
	90	0	5				
Learners with VI are reluctant to learn or use Braille because of a preference for recorded materials and technology with speech output	25	5	5	35	90	2.57	2
	75	10	5				
Complexity of the Braille code	0	20	15	35	55	1.57	6
	0	40	15				
Stigma associated with Braille use	0	20	15	35	55	1.57	6
	0	40	15				
Significant vision loss necessitating the learning of braille	15	10	10	35	75	2.14	3
	45	20	10				
Inadequate trained Braille instructor	0	25	10	35	60	1.71	5
	0	50	10				
Dependence on Technology	25	10	0	35	95	2.71	1
	75	20	0				
Services provided are associated with the goodwill of administrators	0	20	15	35	55	1.57	6
	0	40	15				
Offered for the chance to be excused from submitting assignments in Braille, learners with VI almost always opt for less work	0	10	25	35	45	1.29	7
	0	20	25				
Limited time to work directly with learners with VI in such specialized areas as Braille instruction	20	15	0	35	90	2.57	2
	60	30	0				
Limited resources available in schools than with the actual needs of the learners with VI	5	20	10	35	65	1.86	4
	15	40	10				
Learners with VI are served through the itinerant model	10	20	5	35	75	2.14	3
	30	40	5				
Adaptation of syllabus for the learners with visual impairment	0	5	30	35	40	1.14	8
	0	10	30				

It can be discussed from the above table that the Special teachers expressed that learners with visual impairment use print as an easier solution than attempting to provide Braille instruction and Braille

material and highly dependent on technology as the main challenge faced by the learners with visual impairment.

The second challenge is that the learners show reluctance to learn or use Braille because of a preference for recorded materials and technology with speech output and the Special teachers have limited time to work directly with students in such specialized areas as Braille instruction.

The third challenge reported is that due to significant vision loss, learning of braille becomes necessary and most of learners with visual impairment were served through the itinerant model.

The other challenges expressed by the Special teachers were limited resources available in schools than with the actual needs of the learner, inadequate trained braille instructor followed by complexity of grade II braille code, stigma associated with the use of braille and when learners are offered for the chance to be excused from submitting assignments in Braille, learners with VI almost always opt for less work.

### Parents' Perception on Challenges in Braille literacy for learners with visual impairment

To find the major challenge faced by parents of learners with visual impairment, Weighted Average rank test is employed. The following table illustrates the result of the study.

**TABLE:2 CHALLENGES IN BRAILLE LITERACY-PERCEPTION OF PARENTS**

Particulars	Agree	Neutral	Disagree	Total	Mean Score	Mean	Rank
Implementation of inclusion of learners who are visually impaired	15	0	5	20	50	1.43	4
	45	0	5				
Increased VI learners dependence on recorded materials and technology using speech	3	5	12	20	31	0.89	8
	9	10	12				
Critical shortage of Special teachers of VI	0	0	20	20	20	0.57	10
	0	0	20				
Inadequate time to practice braille	0	5	15	20	25	0.71	9
	0	10	15				
Itinerant teacher spend less time adapting materials and teaching Braille code	5	5	10	20	35	1.00	7
	15	10	10				
The VI Learners access to many of the same visual materials as her /his peers	18	2	0	20	58	1.66	1
	54	4	0				
Special teachers can provide more immediate support for the literacy program than if the student used Braille	8	6	6	20	42	1.20	6
	24	12	6				
Coping with visual impairment in the regular classroom involved stress on a daily basis	5	5	10	20	35	1.00	7
	15	10	10				
Getting school work completed takes longer for learners with VI than it does for their sighted peers	10	2	8	20	42	1.20	6
	30	4	8				
Using Braille was valuable in providing relief from the visual and physical strain increasing reading endurance	8	12	0	20	48	1.37	5
	24	24	0				
Using Braille is a valuable tool but needs to be taught during the early grades	16	4	0	20	56	1.60	2

	48	8	0				
Learning Braille should be an option for learners in addition to print	3	5	12	20	31	0.89	8
	9	10	12				
Deciding to teach Braille to a learner should be based on the individual needs of the child	13	7	0	20	53	1.51	3
	39	14	0				

It can be discussed from the above table that the Parents expressed that learners with visual impairment access to many of the same visual materials as her /his peers. The second challenge is that the parents felt that Braille is a valuable tool but needs to be taught during the early grades and deciding to teach Braille to a learner should be based on the individual needs of the child. The third challenge expressed was that Implementation of inclusion of learners who are visually impaired was a positive way to equal rights to education in par with the sighted learners. The fourth challenges expressed by the parents were ‘using Braille was valuable in providing relief from the visual and physical strain increasing reading endurance ’among their children.

The others challenges expressed by parents were that getting school work completed takes longer for learners with VI than it does for their sighted peers and that the special teacher can provide more immediate support for the literacy program than if the learner used Braille. Parents too expressed that special teachers spend less time with their children and coping with visual impairment in the regular classroom involved stress on a daily basis.

### **Results and Findings**

The major results and findings of the study are as follows:

1. All the Special teachers were female teachers. More than fifty percent of the teachers handled students at high school level and 42.86% of teachers handled students at higher secondary level. Forty percent of the teachers had 11-15 years of teaching experience followed by teachers with 16-20 years and 22.86% of teachers with 6-10years of teaching experience.
2. Special teachers expressed that learners with visual impairment use print as an easier solution than attempting to provide Braille instruction and Braille material and highly dependent on technology is the main challenge faced by the learners with visual impairment. The second challenge is that the learners show reluctance to learn or use Braille because of a preference for recorded materials and technology with speech output and the Special teachers have limited time to work directly with students in such specialized areas as Braille instruction
3. The third challenge reported is that due to significant vision loss, learning of braille becomes necessary and most of learners with visual impairment were served through the itinerant model. The other challenges expressed by the Special teachers were limited resources available in schools than with the actual needs of the learner, inadequate trained braille instructor followed by complexity of grade II braille code, stigma associated with the use of braille and when learners are offered for the chance to be excused from during assignments in Braille, learners with VI almost always opt for less work.
4. Parents expressed that learner with visual impairment access to many of the same visual materials as her /his peers. The second challenge is that the parents felt that Braille is a valuable tool but needs to be taught during the early grades and deciding to teach Braille to a learner should be based on the individual needs of the child. The third challenge expressed was that Implementation of inclusion of learners who are visually impaired was a positive way to equal rights to education in par with the sighted learners.
5. The fourth challenges expressed by the parents were ‘using Braille was valuable in providing relief from the visual and physical strain increasing reading endurance ’among their children .The others challenges expressed by parents were that getting school work completed takes longer for learners with VI than it does for their sighted peers and that the special teacher can provide more immediate support for the literacy program than if the learner used Braille. Parents too expressed

that special teachers spend less time with their children and coping with visual impairment in the regular classroom involved stress on a daily basis

### **Conclusion**

The study revealed that as per the perception of special teachers and parents there exist significant number of learners with visual impairment who face barriers in accessing quality education. For instance, due to frequent change of curriculum, teaching/learning materials, especially production of braille books, has become expensive leading to inadequacy. Furthermore the distribution of Braille machines is grossly inadequate given the number of schools and potential users. In addition, teaching staff, pupils and school management committees have been stigmatizing students with visual impairment due to lack of understanding of their needs and potentials. Inclusion is about the child's right to participate in education and the school's duty to accept and ensure this right. It is thus, about rejecting exclusion of learners, restructuring school policies, curricula and practices so that all learning needs can be met. Only by removing physical and social barriers to learning can we create truly inclusive classrooms and societies and speak of **Education for All** in a holistic sense.

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## ENHANCING COMPETENCY IN LEARNING CONTRACTED BRAILLE AMONG STUDENT TEACHERS

R. Vaijyanthi and G. Victoria Naomi

Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore

### ABSTRACT

Education system needs to nurture the 21st century skills in the student teachers to prepare them as competent and responsible global citizens. The teacher is no more the sole transformer of information. In fact, he/ she is more of a co-learner, motivator and director of students' learning endeavors (Patil and Baviskar,2019).The teacher for the new era needs to be a facilitative teacher to promote enquiry, reflection, experimentation as well as problem solving and creativity among the learners. Hence professional development of Student Teacher needs to be upheld through Teacher Education Program. Teachers of Visually Impaired Students now-a-days have minimal training in braille in the teacher training program. Hence in this study the authors adopted Braille Premier Manual to teach Contracted Braille among Student Teachers. To study the impact of training in Contracted Braille, Student Teachers (104) specialized in Visual Impairment have been selected from B.Ed institutions in and around Coimbatore city .The design adopted in the study is Quasi experimental study. Here Pre test and Post test were done besides treatment. Analysis of Performance of scores revealed that there was a significant impact of learning of Contracted Braille among Student Teachers.

**Keywords:** Braille literacy, Contracted Braille, Special teachers ,Student Teachers, Learners with Visual Impairment

### Introduction

Education system needs to nurture the 21st century skills in the student teachers to prepare them as competent and responsible global citizens. The teacher is no more the sole transformer of information. In fact, he/ she is more of a co-learner, motivator and director of students' learning endeavors (Patil and Baviskar,2019). The teacher for the new era needs to be a facilitative teacher to promote enquiry, reflection, experimentation as well as problem solving and creativity among the learners. Hence professional development of Student Teacher needs to be upheld through Teacher Education Program.Braille is not a code to be deciphered but it is a method of reading and writing that is equal in value to print for sighted people. The way in which blind and partially sighted people develop literacy skills may differ, but the goal is the same: to use reading, writing, and other literacy tools to gather and understand important information and to convey important information to themselves and to others.Teachers of Visually Impaired students now-a-days have minimal training in braille in the teacher training program. They may not have hands-on-training using slate and stylus in today's context. This lack of training directly

impacts the braille learning of visually impaired students. Globally it is addressed that braille teaching has not been given significance on the paradigm of using tactile mode that has been shifted to audio mode with technology addition.But discussions and questions have raised about the level of proficiency teachers in Braille.In the teacher training program there is no uniformity on teaching braille proficiency. Hence in this study the authors adopted Braille Premier Manual to teach Contracted Braille among Student Teachers.To study the impact of training in Contracted Braille, Student Teachers (104) specialized in Visual Impairment have been selected from B.Ed institutions in and around Coimbatore city .The design adopted in the study is Quasi experimental study. Here Pre test and Post test were done besides treatment.Analysis of Performance of scores revealed that there was a significant impact of learning of Contracted Braille among Student Teachers.

### REVIEW OF LITERATURE

Wittenstein, S. H. (1994)in his study on "**Braille literacy: Preservice training and teachers'**attitudessurveyed a national sample of 1,663 teachers of blind and visually impaired students to know about their perceptions of their competence in braille and

in teaching braille, their attitudes toward braille, and their training in braille. The majority of the teachers were confident in their braille abilities, clearly recognized the importance of braille, and strongly supported the use of braille with their students. Ss' type of braille training was related to feelings of competence in their braille skills, to ability to teach braille, and to attitudes toward braille as a learning medium for students. Further, preservice programs that placed greater emphasis on methodology of teaching braille reading produced teachers who were more likely to feel competent in their braille skills and in their ability to teach braille. So this training also had more positive attitudes toward braille.

NavinkumarJadamali and etal., in their study on "**Electronic Progressive Braille Learning Kit for Blind**" (Low Cost, All Languages and Multiline Braille Screen) stated that Learning the Braille script is not an easy task for Visually Impaired students. Visually Impaired students have to memorize/remember various patterns of keys of Braille matrix assigned for different letters/words/symbols in Braille script to read and write effectively. The electronic Braille kit is for helping them out with the more difficult stages of learning Braille to expand their knowledge and assistance in orientation and mobility. Braille Keypad, which can be used to help users learn Braille by tactile signals, and also hearing it read out to them. The keypad allows visually impaired users to enter Braille characters into the system easily for different use and works. The integration of physical activity and hearing can facilitate easy learning of Braille Script (all languages). It consists of a keypad same as Braille Cell which is based on the Braille matrix (3\*2 matrixes) with two extra control keys. The user first listens to the instructions and gets the training from the kit, then enters the combination of keys in compliance with internationally accepted Braille matrix/script, the device in turn pronounces corresponding output of letter/word/symbols/contractions (flexible for all languages). The study is an attempt to utilize technology to educate the visually impaired students.

Mehak Khurana and Jyotika Pruth in their study on "**A New Multimedia Approach to Combat Illiteracy in blind Children**" stated that Less than 3% of the 145 million blind people living in developing countries are literate. This low literacy rate is partly due to the lack of trained teachers and the challenges associated with learning Braille on a traditional slate and stylus. The solution to this problem is to develop a prototype of a cost effective and user friendly device, capable of facilitating Braille tutoring among the blind. The proposed device aims to incorporate tactile, audio and visual output for the user that can be used for both self and peer-to-peer learning. The prime feature of this -system is 3D pattern formation in Braille language for different alphabets and numbers to facilitate Braille learning through a sense of touch. This device opens up the possibility of an adult who does not have formal Braille training but can assist and help the blind student to learn Braille and also assess their learning levels. This paper provides an overall survey about problems faced using conventional methods for teaching and an insight into developing an effective tutor system for the blind

Sheila Amato in the study on "**Standards for Competence in Braille Literacy Skills in Teacher Preparation Programs**" reports on a descriptive study of standards and criteria for competence in braille literacy within teacher preparation programs and the specific role played in the achievement of proficiency in braille literacy by university teacher preparation programs in blindness and visual impairment. It contains a summary of the need for such research, historical background, research methods, and a discussion of standards and implications for personnel preparation. Abstract

Vaijayanthi, R and Victoria Naomi in their study on "**Teachers' and Parents' Perceptions on challenges in Learning Braille for Learners with Visual Impairment**" reports that Braille is vital to all visually impaired individuals and it's the only system through which visually impaired children can learn to read and write, yet the rate of Braille literacy among visually impaired people belonging to developing countries

including Tamil Nadu is alarmingly low. Visually impaired child also needs educational support from the parents and it is the responsibility of the parents to always keep the morale up of their visually impaired child in all situations and provide him/her a barrier free environment. Keeping these points in view an attempt was done to know the teachers' and parents' perception on challenges in learning Braille for learners with visual impairment. The objectives of the study were to analyze special teachers' perceptions and parents' perception on challenges in Braille instruction for learners with visual impairment in Inclusive and Special schools and to find out the use of Braille and assistive technology for learners with visual impairment. Survey method was used to gather the details. The study was carried out with thirty five Special teachers and twenty Parents of learners with visual impairment. Qualitative and quantitative analysis was done to analyze the perception of special teachers and parents of learners with visual impairment. Results revealed that the Special teachers expressed that learners with visual impairment use print as an easier solution than attempting to provide Braille instruction and Braille material and highly dependent on technology as the main challenge faced by the learners with visual impairment. The Parents expressed that learner with visual impairment access to many of the same visual materials as her /his peers. The second challenge is that the parents felt that Braille is a valuable tool but needs to be taught during the early grades and deciding to teach Braille to a learner should be based on the individual needs of the child.

### **Need for the Study**

Literacy has become a high priority for all school systems. The educational options for students who are blind and visually impaired also reflect this increased concern for the educational competence of our school-age population. Though it is obvious that literacy is a key factor in determining success in life, including employment, it would appear that Braille literacy has declined dramatically in the past few decades and is now at a critically low level worldwide. States are becoming concerned about the competence of Braille

teachers and the depth of their knowledge of the Grade 2 Braille code, their ability to teach Braille competently, and their ability to acquire or produce instructional materials in Braille. Yet in spite of all this, Braille will remain relevant so long as print is relevant and is unlikely to be replaced by other technologies for the foreseeable future, since it is a foundational skill for literacy, numeracy and information access for people who are blind (Vision Australia, July, 2011). The review of researches revealed that there are no such specific researches yet regarding the training of contracted braille through online mode of studentteachers through teacher education programe. Hence this research holds unique significance in experimenting the trainingprograme for student teachers. The present study was therefore conceptualized to enhance competency in learning contracted Braille among student teachers. Since Braille literacy in schools for learners with Visual impairment is of paramount importance in addressing concerns about the decline in Braille in Tamil Nadu and beyond. Hence, an attempt was made to know the status of Braille literacy instructionamong student teachers and to enhance the quality of literacy through training in Contracted Braille and promise higher prospects for Student Teachers and learners with Visual Impairment.

**Objectives of the study** were to

1. To analyze the knowledge and skill of Contracted Braille among Student Teachers
2. To find out the impact of Online instruction using Braille Premier Module in learning Contracted Braille among Student Teachers.

### **Method of Study**

To study the impact of training in Contracted Braille, Student Teachers specialized in Visual Impairment have been selected from B.Ed institutions in and around Coimbatore city. The sample consisted of 104 student teachers. The design adopted in the study is Quasi experimental study. Here Pre test and Post test were administered besides treatment.

**Administration of Tool**

1. A Personal data bank was developed to know the general information of the Student Teachers
2. Preparation of Training Modules on Contracted Braille for Student Teachers

Contractions have the categories such as Alphabet word signs, Strong word, Lower word, Dot 5 initial letter, Dot 4-5 initial letter, Dot 4-5-6 initial letter, Final letter, Short form words, Indicators, Punctuation and Grouping punctuation. About 12 modules were prepared based on the Training Manual on BRAILLE PRIMER with exercises published by Royal institute for the Blind. The Student Teachers were trained with Contracted Braille in sessions with 40 hours of instruction (Table-1). Pre test and Post test were done besides treatment.

**Table1: Grade 2 Braille Contractions**

S.No	Grade 2 Braille Contractions	Number
1.	Alphabet Whole word contractions	23
2.	Special word signs	06
3.	Simple upper group signs & Word signs	11
4.	Lower Group signs	10
5.	Punctuation	17
6.	Compound Signs-Initial Word signs With Dot 5	22
7.	Initial Word signs With Dot 4 5	05
8.	Initial Word signs With Dot 4 5 6	06
9.	Final group signs	12
10.	Composite punctuation signs	08
11.	Short forms	75
12.	Indicators	25
	Total	220

**Analysis and Interpretation**

The sample comprised of One hundred and four student teachers. Qualitative and Quantitative Analysis were used and tabulated as follows.

**1. Demographic details of the sample**

Cent percent of the sample were female Student Teachers holding an Undergraduate

degree. About sixty one percentage of Student Teachers were from rural areas as against 39% of them were from urban areas. Cent percent of the Student Teachers were specialized in Visual Impairment.

**2. Analysis of Overall Performance of Contracted Braille among Student teachers**

**Table 2: Testing wise Mean, SD, df and correlated t-value of Overall Scores**

Overall Scores	Test	N	df	Mean	SD	t-Value
	Pre	10	10	70.05	59.98	2.83*
	Post	4	3	50.22	45.49	

**\*\* Significant at 0.01 level**

From the above table, it is evident that the t-value is 2.83 with df=103 for the overall scores which is significant at 0.01 level. It indicates that pre and posttest score of all components differ significantly. It means that there was a significant impact of Online Instruction using Braille Premier Manual in learning Contracted Braille Words among Student Teachers. In the light of the null hypothesis that **“there is no significant difference in mean of Overall Scores of Contracted Braille among Students teachers”** is rejected. It may therefore be said that training enhanced the performance of Contracted Braille among Student Teachers.

**3. Analysis of Performance of Lower Signs among Student Teachers**

**Table 3: Testing wise Mean, SD, df and correlated t-value of Lower Signs**

Lower Signs	Test	N	df	Mean	SD	t-Value
	Pre	104	103	2.52	2.91	3.24**
	Post			3.88	3.48	

**\*\* Significant at 0.01 level**

From the table 3 it is evident that the t-value is 3.24 with df=103 for the Lower Signs is significant at 0.01 level. It indicates that pre and posttest score of Lower Signs differ significantly. It means that there was a significant impact of Online Instruction using Braille Premier Manual in learning Lower Signs among Student Teachers. In the light of the null hypothesis that **“there is no**

**significant difference in mean scores of Lower Signs among Student Teachers”** is rejected. It may therefore be said that the training enhanced the Performance of Lower sign words among Student Teachers.

#### 4. Analysis of Performance of Short forms among Student teachers

**Table 4: Testing wise Mean, SD, df and correlated t-value of Short Forms**

Short Forms	Test	N	df	Mean	SD	t-Value
	Pre					
Post	26.56	25.10				

\*\* *Significant at 0.01 level*

From the table 4, it is evident that the t-value is 2.69 with  $df=103$  for the Short Forms which is significant at 0.01 level. It indicates that pre and posttest score of Short forms differ significantly. It means that there was a significant impact of Online Instruction using Braille Premier Manual in learning Short form Contracted Braille words among Student Teachers. In the light of the null hypothesis that **“there is no significant difference in mean of Short Form Contracted Braille words among Student teachers”** is rejected. It may therefore be said that the training enhanced the performance of Short forms among Student teachers.

#### RESULTS AND FINDINGS

The major results and findings of the study are as follows:

1. Cent percent of the sample were female student teachers holding an undergraduate degree. About sixty one percentage of

student teachers were from rural areas as against 39% of them were from urban areas. Cent percent of the teachers were specialized in Visual Impairment

2. It is evident that the t-value is 2.83 with  $df=103$  for the overall scores is significant at 0.01 level which indicates that there was a significant impact of Online Instruction using Braille Premier Manual in learning Contracted Braille words among Student Teachers .
3. Analysis of Performance of Lower Signs among Student teachers indicates that there was a significant impact of Online Instruction using Braille Premier Manual in learning Lower sign Braille words among Student Teachers (t-value is 3.24).
4. Analysis of Performance of Short forms among Student teachers indicates that there was a significant impact of Online Instruction using Braille Premier Manual in learning short form Contracted Braille words among Student Teachers (t-value is 2.69).

#### CONCLUSION

The study revealed that there was a significant impact of knowledge gained in the acquisition of contracted braille concepts after training. The Student Teachers were able to enhance their knowledge in Contracted Braille through Online Instruction using Braille Premier Manual and thereby gain the expertise over Braille script.

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## **PERFORMANCE OF STUDENT TEACHERS IN LEARNING CONTRACTED BRAILLE**

*R.Vaijyanthi*, Asst. Professor, Avinashilingam Institute for Home Science and Higher Education  
for Women, Coimbatore

*Prof.G.Victoria Naomi*, Professor & HOD of Special Education, Avinashilingam Institute for Home  
Science and Higher Education for Women, Coimbatore

### **Abstract**

The basic foundational skills are reading and writing that help the learners with visual impairment to achieve a self-sufficient adult life. Braille is a replica of print and a tactual system used by the blind /visually impaired to read and write by touch. The teacher for the current era needs to be an efficacious teacher to encourage investigation, insight, practice innovative ideas as well as problem solving and invention among the learners. In this context the professional qualities of student teacher needs to be supported through Teacher Education Program. Teachers of Visually Impaired Students now-a-days have minimal training in braille in the teacher training program. Hence in this study the authors adopted Braille Premier Manual to train Contracted Braille among Student Teachers. To study the performance of Student Teachers in Contracted Braille, One hundred and four student teachers specialized in Visual Impairment have been selected from B.Ed institutions in and around Coimbatore city. The design adopted in the study is Quasi experimental study. Here Pre and Post test were done besides treatment. Analysis of Performance of scores revealed that there was a significant impact of learning of Contracted Braille among Student Teachers.

**Key Words:** Braille literacy, Contracted Braille, Special teachers, Student Teachers.

### **Introduction**

The basic foundational skills are reading and writing that help the students with visual impairment to achieve a self-sufficient adult life. Braille is not a language but a tactile code used by the blind /visually impaired to read and write by touch. In order to meet the need for sufficient braille literacy instruction, teacher preparation programs should be encouraged to train teachers of learners with visual impairment. The teacher for the current era needs to be an efficacious teacher to encourage investigation, insight, practice innovative ideas as well as problem solving and invention among the learners. Braille uses contractions to improve the speed of reading by touch and also to reduce the bulk of embossed transcriptions. Teachers of Visually Impaired students now-a-days have minimal training in braille in the teacher training program. They may not have hands-on-training in contracted braille today's context. This lack of training directly impacts the braille learning of visually impaired students. Globally it is addressed that braille teaching has not been given significance on the paradigm of using tactile mode that has been shifted to audio mode with technology addition. But discussions and questions have raised about the level of proficiency teachers in Braille. In the teacher training program there is no uniformity on teaching braille proficiency. Hence in this study the authors adopted Braille Premier Manual to teach Contracted Braille among Student Teachers. To study the impact of training in Contracted Braille, Student Teachers (104) specialized in Visual Impairment have been selected from B.Ed institutions in and around Coimbatore city. Non-experimental research method was adopted in the study. Here test were done before and besides treatment. Examination of Performance of scores revealed that there was a significant impact of learning of Contracted Braille among Student Teachers.

### **Review of Literature**

Gandhi, S and et al (2016) in their study on "Braille cell actuator based teaching system for visually impaired students" stated that there are significant improvement in technology that proved important and beneficial to physically disabled people. The technological advancements such as smart cane and smart phones for the blind have assisted in their daily life activities. There are screen readers as well as an iPhone application for typing in braille on the touch screen and even today, teaching aids like

Wooden Boards with Embossed Dots or indentations are used for teaching Braille alphabet to visually impaired students in their School. Currently, with this technique, a single tutor can teach only a single student at a time and requires considerable amount of time in teaching the alphabet individually to every visually impaired.

Barclay and etal(2019) in their study on “Effective Teaching Strategies: Case Studies from the Alphabetic Braille and Contracted Braille Study” discussed some of the qualitative data that were documented during the Alphabetic Braille and Contracted Braille Study. Two case studies of students were described, indicating various effective teaching strategies used by their teachers of students with visual impairments that resulted in the students’ successful academic progress.

Kavitha and etal., in their study on “Braille Teaching System for the Visually Impaired” highlighted that the technological advancements has changed radically the way of teaching of the Visually impaired people who are assisted with various devices. In the proposed system a novel method of teaching braille Codes is designed with solenoid actuators. The tutor transmits the characters wirelessly to the students panel which is received by Bluetooth module. The corresponding Braille Codes are represented by energizing the solenoids providing a tactile interface and the voice output of the character is given through speaker. Thus any tutor can teach the Visually Impaired.

Robert Wall and etal., in their study on”Acquisition of Literacy Skills by Young Children who are Blind: Results from the ABC Braille Study”examined the reading and writing skills of young braille-reading students. Students who were introduced to more contractions earlier in instruction performed better on reading measures, such as vocabulary, decoding, and comprehension, but all students did well in spelling. Thus, the authors concluded that literacy instruction should focus primarily on basic reading skills.

Vaijyanthi,R and Victoria Naomi in their study on ”Learning Medium for Students with Visual Impairment” examined the learning medium and appropriate educational devices of students with visual impairment in Inclusive and Special schools .Results indicate that majority of the samples(77.66%) were students with Low vision than totally blind students(22.34%) . The study revealed that students with visual impairment used book prints ,reader services, digital/recorded books , audio tapes/speech input, large print with/without the aid of magnifiers as their learning medium. Nearly 52.38% of totally visually impaired students used Braille as their learning medium.

Vaijyanthi,R and Victoria Naomi (2021)in their study on ”Challenges in learning Braille for Learners with Visual Impairment-Perception of Special teachers and Parents” revealed that the Special teachers expressed that learners with visual impairment use print as an easier solution than attempting to provide Braille instruction and Braille material and highly dependent on technology as the main challenge faced by the learners with visual impairment. The Parents expressed that learner with visual impairment access to many of the same visual materials as her /his peers. The second challenge is that the parents felt that Braille is a valuable tool but needs to be taught during the early grades and deciding to teach Braille to a learner should be based on the individual needs of the child.

Vaijyanthi,R and Victoria Naomi (2021)in their study on” Enhancing competency in learning contracted Braille among student teachers” enunciated the role of special teacher to be competent in braille codes to train the learners with visual impairment. The analysis of the performance of scores of student teachers revealed that there was a notable impact of learning of contracted braille among student teachers.

Wright,T and etal.,(2019) in their study on” Hand Movements and Braille Reading Efficiency: Data from the Alphabetic Braille and Contracted Braille Study ”used a subset of data from the Alphabetic Braille and Contracted Braille Study and analyzed the patterns and characteristics of hand movements as predictors of reading performance. Statistically significant differences were found between one- and two-handed readers and between patterns of hand movements and reading rates.

Wittenstein, S. H. (1993) in their study grouped 230 teachers of blind and visually impaired learners according to self-assessment of Braille competency and agreement or disagreement with statements about Braille, Nemeth Code, slate and stylus, and computer technology. Group 1 reported training in transcription, rule knowledge, formatting, and proofreading. Group 2 had the same training and spent

10% of class time on methodology for teaching Braille reading. Group 3 had Group 1's training plus an emphasis (more than 10% of class time) on methodology. All the groups reported a strong commitment to Braille reading and writing and continued professional growth.. Results indicate that emphasis on methodology during training is a key factor in long-term retention of Braille skills and acquisition of positive attitudes toward Braille.

### **Need for the Study**

In today's world competency in braille is the capacity to read and write in braille which is essential to a efficient education, employment and wellbeing of life for learners with visual impairment . The learners with sightless and severely partially-sighted children should be given the wisdom to learn and become expert in a system of reading and writing skills in a specific language and that they receive instruction from those who are proficient and qualified to teach Braille (World Blind Union,2017). Though it is clear that competency in braille is a key factor in deciding success in life, including employment, it has declined rapidly in the past few decades crucially low level worldwide .NFB also recommended for research with technology and internet based innovative methods of braille instruction. Online instruction in braille code skills for pre-service teachers offered a high standard, rigid method to provide instruction, with suitable technical support (Koenig and Robinson ,2001). The current study was therefore conceptualized to examine the performance of student teachers in learning contracted Braille . Since Braille competency in inclusive schools for students with visual impairment is of predominant importance and an increasing issue about the reduction in Braille in Tamil Nadu and ahead, an attempt was made to know the status of Braille instruction among student teachers and to enhance the quality of knowledge in contracted braille through online training and promise higher prospects for student teachers and visually Impaired.

**Objectives of the study** were to :

1. To analyze previous knowledge and skill of Contracted Braille among student teachers
2. To find out the effect of Online instruction using Braille Premier Module in learning Contracted Braille among Student Teachers .

### **Method of Study**

To analyze the effect of training in Contracted Braille, student teachers specialized in visual Impairment have been selected from teacher training institutions in and around Coimbatore city. The sample consisted of 104 student teachers .The design adopted in the study is Quasi experimental method. Here tests were administered before and besides treatment.

### **Administration of Tool**

A Personal data bank was prepared to know the general information of the student teachers.

Twelve Training Modules on Contracted Braille for Student Teachers was developed based on the Training Manual on braille primer with exercises published by Royal institute for the Blind. Contractions constituted eleven modules of Grade2 braille. The Student Teachers were trained with Contracted Braille in sessions with 40 hours of instruction .Before and after tests were done besides training.

### **Analysis and Interpretation**

The sample comprised of One hundred and four student teachers. Cent percent of the sample were female Student Teachers holding an Undergraduate degree. About sixty one percentage of Student Teachers were from rural areas as against 39% of them were from urban areas. Cent percent of the samples were specialized in Visual Impairment. Qualitative and Quantitative Analysis were used and tabulated as follows:

#### **1. Testing wise Mean, SD, df and correlated t-value of Alphabet Word Sign**

	<b>Test</b>	<b>N</b>	<b>df</b>	<b>Mean</b>	<b>SD</b>	<b>t-Value</b>
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Alphabet Word Sign	Pre	104	103	10.42	8.95	1.913NS
	Post			12.64	9.29	

It can be interpreted that the t-value is 1.913 with df=103 for the alphabet word sign which is insignificant at 0.01 level. It proves that pre and posttest score of alphabet word sign do not differ remarkably. It means that there was no significant impact of Online Instruction using Braille Premier Manual in learning Alphabet Word sign among student teachers. In the view of the hypothesis that “there is no significant difference in mean scores of Alphabet Word Sign among students teachers” is accepted. It may therefore be stipulated that training did not enhance the performance of Alphabet word sign among student teachers.

## 2. Testing wise Mean, SD, df and correlated t-value of Strong Words

Strong Words	Test	N	df	Mean	SD	t-Value
	Pre	104	103	3.81	5.80	4.09**
	Post			7.45	7.57	

The table -2 reveals that the t-value is 4.09 with df=103 for the scores of strong words which is significant at 0.01 level. It specifies that pre and posttest score of strong words differ substantially. It means that there was a significant impact of Online Instruction using Braille Premier Manual in learning strong words among student teachers. Considering the hypothesis that “there is no significant difference in mean scores of strong words among students teachers” is rejected. It may therefore be assumed that training enhanced the performance of strong words among student teachers.

## 3. Testing wise Mean, SD, df and correlated t-value of Dot 5 with Initial Letter

Dot 5 Initial Letter	Test	N	df	Mean	SD	t-Value
	Pre	104	103	7.63	7.81	2.15**
	Post			9.96	9.06	

From the table, it is perceptible that pre and posttest score of Dot 5 with Initial Letter components differ typically. It means that there was a significant impact of Online Instruction using Braille Premier Manual in learning Words among Dot 5 with Initial Letter student Teachers. Thus the null hypothesis mentioned as “there is no significant difference in mean scores of Dot 5 with Initial Letter among student teachers” is rejected. It may therefore be presumed that training enhanced the performance of Dot 5 with Initial Letter among student teachers.

## 4. Testing wise Mean, SD, df and correlated t-value of Dot 4 – 5 with Initial Letter

Dot 4 and 5 Initial Letter	Test	N	df	Mean	SD	t-Value
	Pre	104	103	2.05	1.78	2.56**
	Post			2.71	2.00	

Since the t-value is 2.56 with df=103 for the Dot 4 - 5 with Initial Letter scores is significant and clear that before and after test score of Dot 4 - 5 with Initial Letter components differ remarkably which means that there was a significant impact of Online Instruction using Braille Premier Manual in learning Dot 4 - 5 with Initial Letter of Contracted Braille Words among Student Teachers. Taking into the account of the hypothesis that “there is no significant difference in mean Scores of Dot 4 - 5 Initial Letter of Contracted Braille among students teachers” is rejected. It may therefore be revealed that training enhanced the performance of Dot 4 – 5 with Initial Letter of Contracted Braille among Student teachers.

## 5. Testing wise Mean, SD, df and correlated t-value of Dot 4 -5 -6 with Initial Letter

Dot 4 5 6 Initial Letter	Test	N	df	Mean	SD	t-Value
	Pre	104	103	2.64	2.54	0.69NS
	Post			2.88	2.80	

It can be discussed that the t-value is 0.69 with df=103 for the Dot 4- 5 -6 with Initial Letter scores which is insignificant at 0.01 level. It indicates that pre and posttest score of Dot 4 -5- 6 with Initial Letter components do not differ obviously. It means that there was a significant impact of Online Instruction using Braille Premier Manual in learning Dot 4- 5 -6 Initial Letter of Contracted Braille

Words among student teachers. Hence the hypothesis stated as “there is no significant difference in mean of Overall Scores of Contracted Braille among students teachers” is accepted. It may therefore be indicated that training did not enhance the performance of Dot 4 -5 -6 Initial Letter Contracted Braille among student teachers.

#### 6. Testing wise Mean, SD, df and correlated t-value of Final Letter

Final Letter	Test	N	df	Mean	SD	t-Value
	Pre	104	103	3.14	3.49	1.73NS
	Post			3.96	3.97	

The current table proves that the t-value is 1.73 with df=103 for the final letter scores which is not significant at 0.01 level. It ensures that pre and posttest score of final letter components do not differ effectively. It means that there was no significant impact of Online Instruction using Braille Premier Manual in learning final letter Contracted Braille Words among student teachers. Taking into consideration of the null hypothesis that “**there is no significant difference in mean of final letter Scores of Final letter among Students teachers**” is accepted. It may therefore be opined that training did not enhance the performance of Final letter of Contracted Braille among Student Teachers.

### Results and Findings

The key results of the study are given below:

1. Cent percent of samples were female student teachers holding an undergraduate degree. Most of the student teachers were from rural (61%) than urban areas (39%). All the student teachers were specialized in training the learners with visual impairment
2. It is proved that t-value is 4.09 with df=103 for the scores of strong words is significant at 0.01 level which stipulates that there was a considerable impact of Online Instruction using Braille Premier Manual in learning strong words of contracted braille among student teachers
3. Analysis of Performance of scores with regard to Dot 5 with Initial Letter among Student teachers indicates that there was a significant impact of Online Instruction using Braille Premier Manual in learning of Dot 5 with Initial Letter Braille words among Student Teachers (t-value is 2.15).
4. Study of Performance of scores with regard to Dot 4 – 5 with Initial Letter among Student teachers indicates that there was a significant impact of Online Instruction using Braille Premier Manual in learning Dot 4 – 5 with Initial Letter of Contracted Braille words among Student Teachers (t-value is 2.56).
5. Analysis of the Performance of scores with regard to Alphabet word sign, Dot 4 – 5-6 with Initial Letter, final letter among Student teachers indicates that there was no significant impact of Online Instruction using Braille Premier Manual in learning Dot 4 – 5 -6with Initial Letter of Contracted Braille words among Student Teachers (t-values 1.913,0.69 &1.73).

### Conclusion

The study revealed that access to contracted braille during training sessions resulted in the acquisition of concepts and reading outcomes among the student teachers .They were able to enhance their knowledge in Contracted Braille through Online Instruction using Braille Premier Manual and thereby gained their expertise over Braille script.

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