

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter deals with the analysis and interpretation of data of the study conducted on “**Impact of Intervention Strategies in Overcoming Dysgraphia among 4th & 5th Class Children at Primary Level in Telangana State**”. It contains major section of analysis. A total of 304 children from 4th and 5th classes administered the tool of intervention strategies. The efficacy of the tool is analysed before and after intervention. The data collected is processed and analysed with the use of both Descriptive and inferential techniques. The results obtained are discussed under the following sections.

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- 4.3.4 Comparison of Grammar skills of Written Expression of 4th and 5th class children before and after Intervention.
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4.1. Descriptive Analysis

Section I

The main objectives of the study were to find out the **“Impact of Intervention Strategies in Overcoming Dysgraphia among 4th& 5th Class Children at Primary Level in Telangana State”**. In doing so, comparison was made between the age groups (9, 10, 11yrs), gender (boys, girls), type or locality of the schools (rural, urban) and their influences in acquiring writing skills. In addition the impact of intervention in overcoming behaviour Skills is analysed. The results of the study are presented as given above.

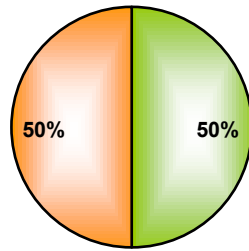
4.1.1 Background Information of the Sample

The background information of the sample in terms of their locality, type of family, educational qualifications of the parents, occupation and family income and siblings are presented in the table 4.1.

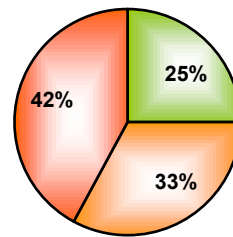
Table 4.1 Back Ground Information of the Children

Groups	Levels	4 th Class Personal Data				T	%	5 th Class Personal Data				Total	
		9		10				10		11			
		N	%	N	%			N	%	N	%	N	%
Gender	Boys	53	56	37	65	90	59	43	48.3	33	52.4	76	50
	Girls	42	44	20	35	62	41	46	51.7	30	47.6	76	50
District	Hyderabad	28	30	10	18	38	25	36	40.4	2	3.2	38	25
	RR	35	37	15	26	50	33	27	30.3	23	36.5	50	32.9
	MBNR	32	34	32	56	64	42	26	29.2	38	60.3	64	42.1
Locality	Urban	50	53	29	51	79	52	74	83.1	2	3.2	76	50
	Rural	45	47	28	49	73	48	15	16.9	61	96.8	76	50
Father's Qualification	Collegiate	61	64	36	63	97	64	57	64	17	27	74	48.7
	Higher Secondary	23	24	14	25	37	24	19	21.3	19	30.2	38	25
	High School	8	8	3	5	11	7	12	13.5	18	28.6	30	19.7
	Illiterate	3	3	4	7	7	5	1	1.1	9	14.3	10	6.6
Mother's Qualification	Collegiate	31	33	17	30	48	32	19	21.3	2	3.2	21	13.8
	Higher Secondary	32	34	19	33	51	34	27	30.3	13	20.6	40	26.3
	High School	25	26	16	28	41	27	40	44.9	29	46	69	45.4
	Illiterate	7	7	5	9	12	8	3	3.4	19	30.2	22	14.5
Type of Family	Joint Family	45	47	26	46	71	47	36	40.4	59	93.7	95	62.5
	Nuclear family	50	53	31	54	81	53	53	59.6	4	6.3	57	37.5
Father's Occupation	Service	37	39	16	28	53	35	31	34.8	4	6.3	35	23
	Business	23	24	18	32	41	27	23	25.8	7	11.1	30	19.7
	Agriculture	30	32	20	35	50	33	31	34.8	48	76.2	79	52
	Labourer	5	5	3	5	8	5	4	4.5	4	6.3	8	5.3
Family Income	High	46	48	27	47	73	48	45	50.6	31	49.2	76	50
	Middle	42	44	22	39	64	42	34	38.2	23	36.5	57	37.5
	Low	7	7	8	14	15	10	10	11.2	9	14.3	19	12.5
No of Siblings	No Siblings	19	20	10	18	29	19	17	19.1	10	15.9	27	17.8
	One Silblings	41	43	18	32	59	39	43	48.3	31	49.2	74	48.7
	Multiple Siblings	30	32	22	39	52	34	28	31.5	20	31.7	48	31.6
No with LD	Siblings	5	5	7	12	12	8	1	1.1	2	3.2	3	2

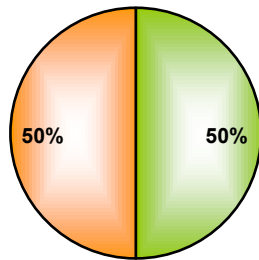
* Family Income from HUDCO 2010; * N-Number, * P-Percent



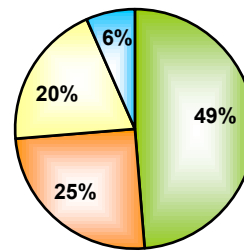
Gender



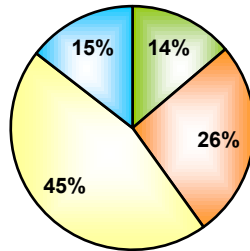
District



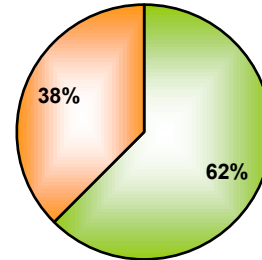
Locality



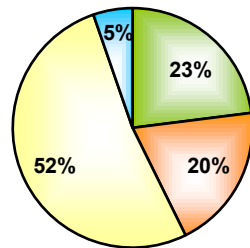
Father's Qualification



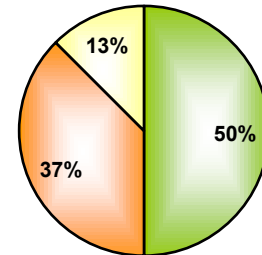
Mother's Qualification



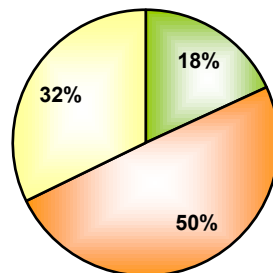
Type of Family



Father's Occupation



Family Income



No of Siblings

Figure 4.1 Back Ground Information of the Children

The number of subjects for the study were 152 children (90 boys 59% & 62 girls 41%) from 4th and 152 children from 5th class (76 boys 50% & 76 girls 50%) are taken from private schools of Telangana district. 79 (52%) children are from urban and 73(48%) from rural schools for fourth class and for 5th class 76(50%) from rural and 76(50%) from urban schools respectively from three districts of Telangana state.

The structure of family revealed that the educational qualifications of parents 64 % of fathers and 32% of mothers for 4th class and 5th class 49% of fathers & 14 % of the mothers were graduates and above. In 4th class 24% of fathers & 34% of mothers and in 5th class 25% of fathers and 26% of the mothers were higher secondary, 7% of fathers and 27% of mothers in 4th class and 20% of fathers and 45% of mothers did high school, 4.3% of fathers & 7.2% of mothers in 4th class 7% fathers and 15% mothers were illiterates in 5th class. This clearly shows the parents of the sample children were well educated. Regarding the occupation of the father 35% of 4th class & 23% of 5th class were in service, 27% in 4th 20% in 5th were in business, 33 % in 4th and 52% in 5th were in agriculture, and 5 % in 4th and 5% in 5th class were labourers. Regarding family income 48% in 4th class 50 % in 5th class have high income, 42% in 4th 38% in 5th have middle income and 10% in 4th & 13% in 5th class have low income clearly indicates that the sample children come mainly from high to middle income groups. No of siblings indicate 40% in 4th class 49% in 5th class have one sibling and 40.5 % in 4th class & 33% in 5th class have more than 1 and 20% in 4th class and 18% in 5th class have no siblings. 8% in 4th and 2% in 5th class of the sample have an LD in the siblings.

4.1.2 Writing Difficulties of 4th and 5th Class Children Before and After Intervention

This analysis depicts the writing difficulties associated with sub skills such as: a) FMS& HWS, b) FMS, HWS, SS, c) HMS, SS & WES, d) SS& WES. The number of students identified in 4th and 5th classes with different areas of writing difficulty were given in the following table.4.2.

Table 4.2 Writing Difficulties of Children Before and After Intervention

Areas of Difficulties	4 th class					5 th class				
	Before Intervention(BI)			After Intervention (AI)		Before Intervention (BI)			After Intervention (AI)	
	Total	N	%	Total No	%	Total	N	%	N	%
FMS& HWS	152	131	86	56	37	152	122	80	62	41
FMS, HWS, SS	152	144	95	65	43	152	134	88	70	46
HMS, SS & WES	152	148	97	89	59	152	147	97	75	49
SS& WES	152	149	98	90	59	152	14	97	100	66
BMS	152	79	52	32	21	152	65	43	28	18

The table above represents all the combinations of areas of writing difficulties for 4th and 5th class children before and after intervention. The children in 4th and 5th classes having difficulty in Fine Motor and Hand Writing Skills were 86% and 80% before intervention which reduced to 37% and 41% respectively. The difficulty in fine motor, hand writing and spellings skills were present in 95% of 4th class and 88% of 5th class before intervention which got reduced to 43% and 46% after intervention. The difficulties in hand writing, spellings and in Written Expression Skills were 97% of 4th class and 97% of 5th class before intervention which came down to 59% for 4th class and 66% of the 5th classes after intervention. Difficulties in spelling and written skills stand at 98% for 4th and 89% in 5th classes before intervention which came down to 59% for 4th and 66% for 5th class. Behavioural skills were exhibited with 52% for 4th and 65% in 5th classes which came down to 21% for 4th and 18% at 5th classes after intervention.

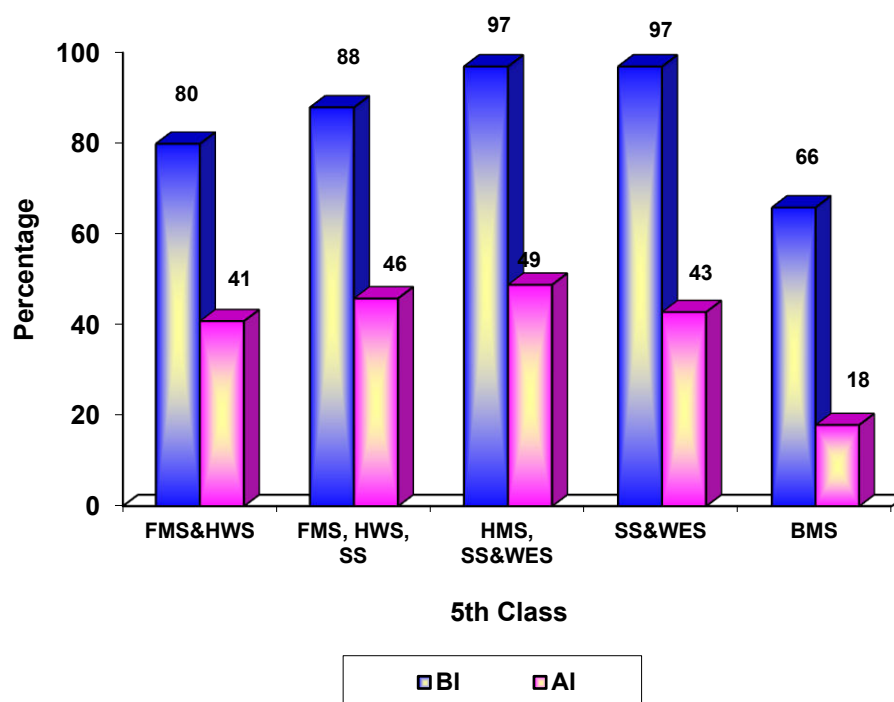
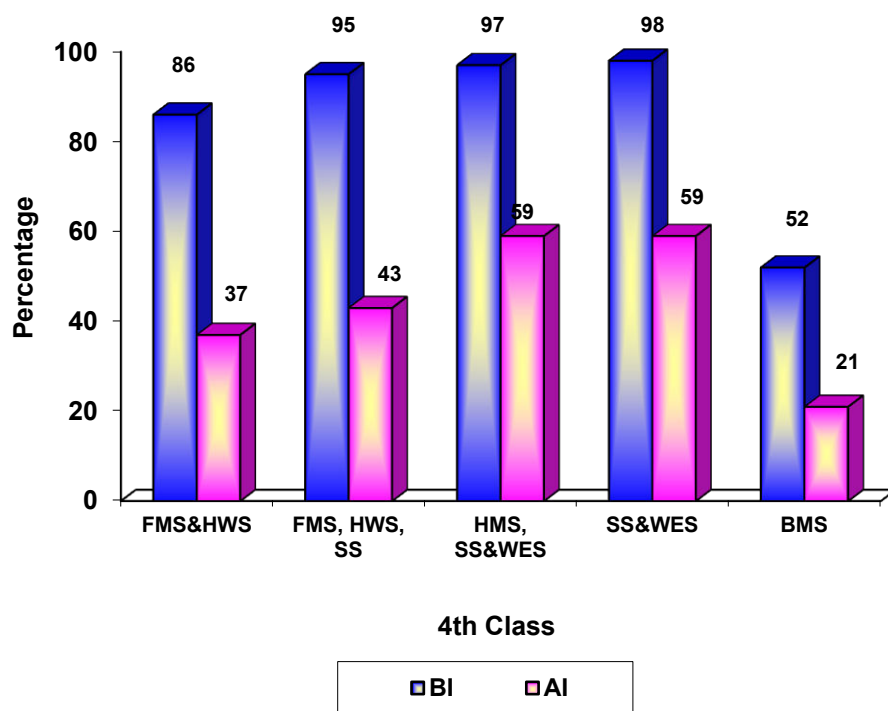


Figure 4.2 Writing Difficulties of 4th & 5th Class

Section II

This section presents the performance of 4th & 5th class children before and after intervention in all the sub skills of writing.

4.1.3 Comparison of 4th & 5th Class Children in the Sub Skills of Fine Motor Skills

The analysis of the performance of the children with writing difficulties before and after intervention is presented in the table below.

4.1.3.a Comparison of Sub Skills of Fine Motor Skills of 4th & 5th class children before and after intervention

The table below shows the performance of 4th and 5th class children before and after intervention in the sub skills of Fine Motor Skills.

Table 4.3 Comparison of Sub Skills of Fine Motor Skills of Children Before and After Intervention

No	Nature of Difficulties	4 th class				5 th class			
		BI		AI		BI		AI	
		N	%	N	%	N	%	N	%
1.	Fine Motor coordination	139	91	66	43	146	96	105	69
2.	Fine Motor Memory & Recall	137	90	57	38	148	97	81	53
3.	Spacial & Directional	126	83	58	38	137	90	80	53
4.	Muscle coordination	121	80	59	39	140	92	99	65
5.	Dexterity of hand and fingers	126	83	62	41	143	94	93	61
6.	In hand manipulation-Bilateral coordination	132	87	73	48	130	86	96	63
7.	Tactile Discrimination	103	68	63	41	141	93	105	69
8.	Kinaesthetic awareness	128	84	67	44	142	93	105	69
9.	Hand Eye Motor Coordination	119	78	53	35	142	93	86	57
10.	Auditory Motor Coordination	133	88	65	43	143	94	90	59
11.	Visual discrimination	119	78	63	41	142	93	108	71
12.	Drawing skills	106	70	52	34	140	92	74	49

The table above presents the Fine Motor skills of 4th and 5th class children before and after intervention. The scores showed significant improvement after intervention in all the sub skills.

1. In fine motor coordination skill deficit from a pretest number of 139 children which is 91% of 4th class and 146 which is 96% of 5th class children. The number of children showing difficulties came drastically down to 66 (43%) of 4th class and 105 (69%) of 5th class. The percentage of 4th and 5th class children showed significant improvement in Fine Motor Skills after intervention in all the skills.
2. In fine motor memory & recall skill deficit in 137 (90%) children of 4th class in pretest it came down to 57(38%) in posttest. In 5th class 148 (97%) number of children with skill deficit showed in pretest it came down to 81(53%) in posttest. The 4th and 5th class children showed significant improvement in Fine motor memory skills after intervention in all the skills.
3. In spacial and directional skill deficit in 4th class from a pretest total of 126 (83%) children the posttest showed only 57 (38%) children with the skill deficit where as in 5th class from a pretest total of 137 (90%) children posttest showed skill deficit in only 80 (53%). The 4th and 5th class children in showed significant improvement spacial and directional skills after intervention in all the skills.
4. In fine muscle coordination skill deficit pretest total of 121(80%) children and the posttest showed only 59 (39%) children with the skill deficit of 4th class and in 5th class from a pretest total of 140 (92%) posttest showed only 99 (65%) children with the skill deficit. The 4th and 5th class children showed significant improvement in muscle coordination skills after intervention in all the skills.
5. In Dexterity of hands and fingers skill deficit in 4th class from a pretest total of 126 (83%) children posttest showed significant improvement with only 57 (38%) children with the skill deficit where as in 5th class from a pretest total of 137 (90%) children posttest showed only 80 (53%) children with the

skill deficit. The 4th and 5th class children showed satisfactory improvement Dexterity of hands and fingers skills after intervention in all the skills.

6. In hand manipulation and bilateral coordination skill deficit in 4th class from a pretest total of 132 (87%) children the posttest showed only 73 (48%) children with the skill deficit where as in 5th class from a pretest total of 130 (86%) children posttest showed skill deficit in only 96 (63%). The 4th and 5th class children showed great improvement in hand manipulation and bilateral coordination skills after intervention.
7. In tactile discrimination skill deficit in 4th class from a pretest total of 103 (68%) children posttest showed significant improvement with only 63 (41%) children with the skill deficit where as in 5th class from a pretest total of 141 (93%) children posttest showed only 86 (57%) children with the skill deficit. The 4th and 5th class children showed significant improvement in tactile discrimination skills after intervention.
8. In kinaesthetic awareness skill deficit in 4th class from a pretest total of 128 (84%) children posttest showed significant improvement with only 67 (44%) children with the skill deficit where as in 5th class from a pretest total of 142 (93%) children posttest showed only 105 (69%) children with the skill deficit. The 4th and 5th class children showed significant improvement in kinaesthetic awareness skills after intervention.
9. In hand eye motor coordination skill deficit in 4th class from a pretest total of 119 (78%) children posttest showed significant improvement with only 53 (35%) children with the skill deficit where as in 5th class from a pretest total of 142 (93%) children posttest showed only 86 (57%) children with the skill deficit. The 4th and 5th class children showed significant improvement in hand eye motor coordination skills after intervention.
10. In auditory motor coordination skill deficit in 4th class from a pretest total of 133 (88%) children posttest showed significant improvement with only 65 (43%) children with the skill deficit where as in 5th class from a pretest total of 143 (94%) children posttest showed only 90 (59%) children with the skill deficit. The 4th and 5th class children showed significant improvement after intervention in all the skills.

11. In visual motor coordination skill deficit in 4th class from a pretest total of 119 (78%) children posttest showed significant improvement with only 63 (41%) children with the skill deficit where as in 5th class from a pretest total of 142 (93%) children posttest showed only 108 (71%) children with the skill deficit. The pre and posttest percentage of 4th and 5th class children showed significant improvement visual motor coordination skill after intervention.

12. In drawing skill deficit in 4th class from a pretest total of 106 (70%) children posttest showed significant improvement with only 52 (34%) children with the skill deficit where as in 5th class from a pretest total of 140 (92%) children posttest showed only 74 (49%) children with the skill deficit. The pre and posttest percentage of 4th and 5th class children showed significant improvement in drawing skills after intervention.

The researcher agrees that the difficulty in writing is basically paying attention (Patnaik, 2002) fine motor coordination and visual motor integration (Volman, et, al, 2006) where Fine Motor Skills (Dinehart and Manfra, 2013) and oral language skills (Puranis & Lonigan, 2012), visual memory (Filippos Vlachos and Argiris Karapetsas, 2003), were better predictors of the LDs. Some interventions like finger tapping (Mather, 2003).

4.1.3.b Difficulties of sub skills of Behaviour Manifestation Skills of 4th& 5th class children before and after intervention

Behaviour Manifestation skills of 4th& 5th class children before (BI) and after intervention (AI) were as shown in the 4.4 table below.

Table 4.4 Difficulties of Behavioural Skills of Children Before and After Intervention

No	Nature of Difficulties	4th class				5th class			
		BI		AI		BI		AI	
		N	%	N	%	N	%	N	%
1.	Frustration, angry to cope up with the disability	100	66	45	30	96	63	40	26
2.	Stressed, fatigued, anxious and depressed	87	57	30	20	72	47	46	30
3.	Difficulty getting along with teachers, parents & peer	91	60	36	24	102	67	43	28
4.	Difficulty maintaining social status	119	78	36	24	122	80	40	26
5.	Frequently absent from school & drop out	74	49	44	29	67	44	54	36
6.	Difficulty to follow instructions	103	68	63	41	119	78	49	32
7.	Low self esteem	140	92	40	26	134	88	46	30
8.	Low self Confidence	138	91	28	18	129	85	30	20
9.	Disorganised with belongings, scattered every where	129	85	78	51	139	91	86	57
10.	Frequently complains of losing books/things	123	81	50	33	109	72	58	38
11.	Avoids tasks & forgets home work	141	93	38	25	138	91	44	29
12.	Keeps moving around class room, disturbs others	87	57	30	20	89	59	32	21
13.	Difficulty handling Peer group	141	93	14	9	137	90	14	9
14.	Difficulty handling bullying	124	82	89	59	101	66	86	57
15.	Parental awareness & acceptance	152	100	59	39	152	100	48	32
16.	School & teachers awareness	145	95	75	49	149	98	68	45

The table above presents the Behaviour Manifestation skills of 4th and 5th class children before and after intervention. The scores showed significant improvement after intervention in all the sub skills.

1. In the behavioural problems of Frustration, angry to cope up with the disability & recall skill deficit in 137 (90%) children of 4th class in pretest it came down to 57(38%) in posttest. In 5th class 148 (97%) number of children with skill deficit showed in pretest it came down to 81 (53%) in posttest. In 4th and 5th class children behavioural skills showed significant improvement after intervention.
2. In the behavioural difficulties of stress, fatigue , anxiety and depression in 4th class from a pretest total of 126 (83%) children the posttest showed only 57 (38%) children with the skill deficit where as in 5th class from a pretest total of 137 (90%) children posttest showed skill deficit in only 80 (53%). The 4th and 5th class children showed significant improvement after intervention.
3. In the difficulty getting along with the parents, teachers and community pretest total of 121(80%) children the posttest showed only 59 (39%)children with the skill deficit of 4th class and in 5th class from a pretest total of 140(92%) posttest showed only 99 (65%)children with the skill deficit. The 4th and 5th class children showed significant improvement after intervention in all the skills.
4. In difficulty maintaining social status in 4th class from a pretest total of 126 (83%) children posttest showed significant improvement with only 57 (38%) children with the skill deficit where as in 5th class from a pretest total of 137 (90%) children posttest showed only 80 (53%) children with the skill deficit. The 4th and 5th class children showed significant improvement after intervention.
5. In problems of frequent absenteeism and drop out in 4th class from a pretest total of 132 (87%) children the posttest showed only 73 (48%) children with the skill deficit where as in 5th class from a pretest total of 130 (86%) children posttest showed skill deficit in only 96 (63%). The 4th and 5th class children showed significant improvement after intervention.
6. In difficulty following instructions in 4th class from a pretest total of 103 (68%) children posttest showed significant improvement with only 63 (41%) children with the skill deficit where as in 5th class from a pretest total of

119 (78%) children posttest showed only 49 (32%) children with the skill deficit. The 4th and 5th class children showed significant improvement after intervention.

7. In problems of low self esteem in 4th class from a pretest total of 128 (84%) children posttest showed significant improvement with only 67 (44%) children with the skill deficit where as in 5th class from a pretest total of 142 (93%) children posttest showed only 105 (69%) children with the skill deficit . The pre and posttest percentage of 4th and 5th class children showed significant improvement in self esteem after intervention in all the skills.
8. In low self confidence problems in 4th class from a pretest total of 119 (78%) children posttest showed significant improvement with only 53 (35%) children with the skill deficit where as in 5th class from a pretest total of 142 (93%) children posttest showed only 86 (57%) children with the skill deficit. The pre and posttest percentage of 4th and 5th class children showed significant improvement in self confidence after intervention.
9. In problems of keeping work table disorganised and scattered with belongings in 4th class from a pretest total of 133 (88%) children posttest showed significant improvement with only 65 (43%) children with the skill deficit where as in 5th class from a pretest total of 143 (94%) children posttest showed only 90 (59%) children with the skill deficit. The pre and posttest percentage of 4th and 5th class children showed significant improvement in organising their belongings after intervention.
10. In the behaviour of frequent complaints of losing books and belongings in 4th class from a pretest total of 119 (78%) children posttest showed significant improvement with only 63 (41%) children with the skill deficit where as in 5th class from a pretest total of 142 (93%) children posttest showed only 108 (71%) children with the skill deficit. The pre and posttest percentage of 4th and 5th class children showed significant improvement after intervention
11. In avoiding tasks and forgetting home works in 4th class from a pretest total of 106 (70%) children posttest showed significant improvement with only

52(34%) children with the skill deficit where as in 5th class from a pretest total of 140 (92%) children posttest showed only 74 (49%) children with the skill deficit . The pre and posttest percentage of 4th and 5th class children in being on task and turning in home works showed significant improvement after intervention in all the skills.

12. In keeps moving around & disturbs others in 4th class from a pretest total of 133 (88%) children posttest showed significant improvement with only 65 (43%) children with the skill deficit where as in 5th class from a pretest total of 143 (94%) children posttest showed only 90 (59%) children with the skill deficit. The pre and posttest percentage of 4th and 5th class children showed significant improvement after intervention in all the skills.
13. In difficulty handling peer group in 4th class from a pretest total of 119 (78%) children posttest showed significant improvement with only 63 (41%) children with the skill deficit where as in 5th class from a pretest total of 142 (93%) children posttest showed only 108 (71%) children with the skill deficit. The pre and posttest percentage of 4th and 5th class children In hand to eye coordination skills showed significant improvement in getting along with peer group after intervention.
14. In difficulty handling bullying in 4th class from a pretest total of 106 (70%) children posttest showed significant improvement with only 52(34%) children with the skill deficit where as in 5th class from a pretest total of 140 (92%) children posttest showed only 74 (49%) children with the skill deficit. The pre and posttest intervention in all percentage of 4th and 5th class children showed significant improvement after intervention.
15. In awareness of parents in 4th class from a pretest total of 119 (78%) children posttest showed significant improvement with only 53 (35%) children with the skill deficit where as in 5th class from a pretest total of 142 (93%) children posttest showed only 86 (57%) children with the skill deficit. The pre and posttest percentage of 4th and 5th class children showed significant improvement in parental awareness and acceptance after intervention.

16. In awareness of the schools and teachers to the learning disabilities of the children in 4th class from a pretest total of 119 (78%) children posttest showed significant improvement with only 53 (35%) children with the skill deficit where as in 5th class from a pretest total of 142 (93%) children posttest showed only 86 (57%) children with the skill deficit. The pre and posttest percentage of 4th and 5th class children showed significant improvement after intervention. The null hypothesis that "there is no significant change in the behaviour of children before and after intervention" is rejected.

The findings of the study reveal that the behavioural problems can be tackled with proper interventions in place. There should be awareness in all about learning disabilities and it should be compulsorily taught to Doctors, School Teachers, Counselors and General Public (Karande, 2008). There were negative attitudes and beliefs in parents to accept LD (NCLD, 2012, 2013) and low level of knowledge and awareness about LD (Saludes and Dante, 2009) due to socio economic factors in India (Sreedevi and Mayuri, 2006). A marked acceptance is seen in parents of late in accepting the challenges of LDs in USA (GfK Roper, 2010).

4.1.3.c Comparison of Sub Skills of Hand Writing of 4th& 5th Class Children Before and After Intervention

The comparison of sub skills of hand writing is collected as given in the table 4.5 below.

Table 4.5 Comparison of the Sub Skills of Hand Writing of Children Before and After Intervention

No	Sub Skills	Test	N	4th class		5th class	
				N	%	N	%
1.	Over all legibility	BI	152	129	85	125	82
		AI	152	38	25	41	27
2.	Capital & small letters mixing	BI	152	119	78	124	82
		AI	152	28	18	33	22
3.	Irregular size	BI	152	138	91	111	73
		AI	152	43	28	15	10
4.	Reverse Letters& Numbers	BI	152	107	70	114	75
		AI	152	36	24	45	30
5.	Add or omit space	BI	152	132	87	122	80
		AI	152	30	20	20	13
6.	Omission letters & words	BI	152	114	75	125	82
		AI	152	27	18	38	25
7.	Slow and laborious copying	BI	152	130	86	114	75
		AI	152	38	25	22	14
8.	Strike off	BI	152	114	75	122	80
		AI	152	30	20	39	26
9.	Write in all directions	BI	152	126	83	119	78
		AI	152	33	22	27	18
10.	Working in line & margin	BI	152	110	72	134	88
		AI	152	30	20	42	28
11.	Pencil Grip	BI	152	118	78	109	72
		AI	152	32	21	50	33
12.	Paper Position	BI	152	90	59	127	84
		AI	152	26	17	41	27
13.	Alphabet , word, sentence Formation	BI	152	114	75	131	86
		AI	152	30	20	40	26

The table above showed a significant improvement in all the sub skills of hand writing as discussed in detail below.

1. In Hand writing sub skill of overall legibility deficit from a pretest no of 129 (85%) of 4th class and 125 (82%) of 5th class the percentage of children showing difficulties came drastically down to 38 (25%) of 4th class and 41(27%) of 5th class in the posttest. The 4th and 5th class children showed significant improvement after intervention in the legibility of writing.
2. In Hand writing sub skill of capital and small letters mixing deficit from a pretest no of 119(78%) of 4th class and 124(82%) of 5th class the no and percentage of children showing difficulties came drastically down to 28(18%) of 4th class and 33 (22%) of 5th class in the posttest. The 4th and 5th class children showed significant improvement after intervention in all and capital and small letters mixing skill deficit.
3. In skill deficit of irregular letter size and font from a pretest no of 138 (43%) of 4th class and 111 (73%) of 5th class the no and percentage of children showing difficulties came drastically down to 43 (28%) of 4th class and 15 (10%) of 5th class in the posttest. The 4th and 5th class children showed significant improvement after intervention in letter size and font.
4. In reversal of letters and numbers from a pretest no of 107(70%) of 4th class and 114 (75%) of 5th class the percentage of children showing difficulties came greatly down to 36 (24%) of 4th class and 45 (30%) of 5th class in the posttest. The 4th and 5th class children showed significant improvement after intervention in reversal of letters and numbers.
5. In omission and addition of space between letters and words from a pretest of no of 132 (87%) of 4th class and 122 (80%) of 5th class the percentage of children showing difficulties came very much down to 30(20%) of 4th class and 20 (13%) of 5th class in the posttest. The of 4th and 5th class children showed significant improvement after intervention in omission and addition of space.

6. In omission and addition of letters between words from a pretest no of 114 (75%) of 4th class and 125 (82%) of 5th class the percentage of children showing difficulties came drastically down to 27 (18%) of 4th class and 38(25%) of 5th class in the posttest. The 4th and 5th class children showed significant improvement after intervention in omission and addition of letters between words.
7. In Slow and laborious copying from a pretest no of 130 (80%) of 4th class and 114 (75%) of 5th class the percentage of children showing difficulties came down to 38(25%) of 4th class and 22 (14%) of 5th class in the posttest. The 4th and 5th class children in Hand Writing Skills showed significant improvement after intervention in all the skills.
8. In Making lot of erasals and wipe off in the notes from a pretest no of 114 (75%) of 4th class and 122 (80%) of 5th class the percentage of children showing difficulties came drastically down to 30 (20%) of 4th class and 39 (26%) of 5th class in the posttest. The 4th and 5th class children showed significant improvement after intervention in lot of erasals and wipe offs.
9. In the problems of writing in all directions a pretest no of 126(83%) of 4th class and 119 (78%) of 5th class the percentage of children showing difficulties came a lot down to 33 (22%) of 4th class and 27 (18%) of 5th class in the posttest. The 4th and 5th class children showed significant improvement after intervention.
10. Writing in line on the margins from a pretest no of 110(72%) of 4th class and 134 (88%) of 5th class the percentage of children showing difficulties came down greatly to 30 (20%) of 4th class and 42 (28%) of 5th class in the posttest. The 4th and 5th class showed significant improvement after intervention in all the skills.
11. In Improper pencil grip from a pretest no of 118(78%) of 4th class and 109 (72%) of 5th class the percentage of children showing difficulties came drastically down to 32 (21%) of 4th class and 50 (33%) of 5th class. The 4th and 5th class children showed significant improvement after intervention.

12. In paper position & bilateral coordination skills from a pretest no of 90(59%) of 4th class and 127 (84%) of 5th class the percentage of children showing difficulties came down to 26 (17%) of 4th class and 41(27%)of 5th class in the posttest. The 4th and 5th class children showed significant improvement after intervention.

13. In alphabet, word and sentence formation a pretest no of 114 (75%) of 4th class and 131 (86%) of 5th class the percentage of children showing difficulties came drastically down to 30 (20%) of 4th class and 40 (26%) of 5th class in the posttest. The 4th and 5th class children showed significant improvement after intervention in all the skills.

Over all the children from both the classes showed significant improvement after intervention in all the sub skills of hand writing. **This contradicts the null hypothesis that there is no significant difference in the sub skills of hand writing skills and so it is rejected.**

The present study related to Hand Writing Skills agrees on classroom facilities and atmosphere (Dominica, 2011) to be congenial for a proper study for these children.

Drill and fine motor activities practice improved Hand writing (Alyssa L. Crouch Jennifer J. Jakubecy, 2007).

4.1.3.d Comparison of the Sub Skills of Spelling Skills of 4th&5th Class Children Before and After Intervention

The difficulties in the sub skills of Spellings of 4th and 5th class children before and after intervention was as given in the 4.6 table below.

Table 4.6 Sub Skills in Spelling Skills of Children Before and After Intervention

No	Skills	Test	N	4 th class			5 th class				%
				No	%	Diff	%	No	%	Diff	
1.	Basic Spelling	BI	152	123	81	61	40	103	68	45	30
		AI	152	62	41			58	38		
2.	Phonetics	BI	152	114	75	50	33	119	78	74	49
		AI	152	64	42			45	30		
3.	Auditory Discrimination	BI	152	104	68	50	33	113	74	46	30
		AI	152	54	36			67	44		
4.	Visual Discrimination	BI	152	122	80	60	39	112	74	44	29
		AI	152	62	41			68	45		
5.	Silent & Scrambled Words	BI	152	115	76	46	30	124	82	67	44
		AI	152	69	45			57	38		
6.	Decoding& Syllabication	BI	152	118	78	47	31	111	73	43	28
		AI	152	71	47			68	45		
7.	Reading Fluency Comprehension	BI	152	126	83	55	36	125	82	49	32
		AI	152	71	47			76	50		

Spelling Skills of 4th and 5th class showed that they improved tremendously as shown by the number of children and percentage of improvement before and after intervention.

The sub skills in vocabulary of 4th class children showed improvement from a pretest number of children 123 (81%) to a posttest 62 (41%) number of children. The improvement in skills for 5th class is from a pretest number of 103 (68%) to a posttest number of 58 (38%) children showing the skill deficit. Skill

difference with significant improvement is seen in 61 children (40%) in 4th class and 45 children (30%) due to intervention strategy activities.

The sub skills in phonetics of 4th class improved from a pretest number of children & percentage of 114 (75%) to a posttest number of children & percentage of 64 (42%) 5th class children improved from a pretest number of children & percentage of 119 (78%) to a posttest number & percentage of 45 (30%) children. 50 children with 40% in 4th class and 74 children with 49% showed significant improvement in phonetics due to intervention strategy.

The sub skills in auditory discrimination of 4th class children showed improvement from a pretest number of 104 (68%) children to a posttest 54 (36%) children. The improvement in skills for 5th class is from a pretest number of 113 (74%) to a posttest number of 67 (44%) children showing the skill deficit. Skill difference with significant improvement is seen in 50 children (33%) in 4th class and 46 children (30%) due to intervention strategy activities.

The sub skills in visual discrimination of 4th class children showed improvement from a pretest number of 123 (80%) children to a posttest 62 (41%) children. The improvement in skills for 5th class is from a pretest number of 112 (74%) to a posttest number of 68 (45%) children showing the skill deficit. Skill difference with significant improvement is seen in 60 children (39%) in 4th class and 44 children (29%) due to intervention strategy activities.

The sub skills in silent & scrambled words of 4th class children showed improvement from a pretest number of 115 (76%) children to a posttest 69 (45%) children. The improvement in skills for 5th class is from a pretest number of 124 (82%) to a posttest number of 57 (38%) children showing the skill deficit. Skill difference with significant improvement is seen in 46 children (30%) in 4th class and 67 children (44%) due to intervention strategy activities.

The sub skills in decoding & syllabication of 4th class children showed improvement from a pretest number of 118 (78%) children to a posttest 71 (47%) children. The improvement in skills for 5th class is from a pretest number

of 111 (73%) to a posttest number of 68 (45%) children showing the skill deficit. Skill difference with significant improvement is seen in 47 children (31%) in 4th class and 43 children (28%) due to intervention strategy activities.

The sub skills in reading comprehension and fluency of 4th class children showed improvement from a pretest number of 126 (83%) children to a posttest 71 (47%) children. The improvement in skills for 5th class is from a pretest number of 125 (82%) to a posttest number of 76 (50%) children showing the skill deficit. Skill difference with significant improvement is seen in 55 children (36%) in 4th class and 49 children (32%) due to intervention strategy activities.

The findings of the research agrees with Studies on Spelling Skills show errorful training(Raymer, Strobel, 2010)corrective feed back methods(Morgan Watson, et.al 2009), non intensive spell study-spell intervention procedure, Johns, (2009), bigraph biphone segment blending approach by Bowes (2007), mnemonics recall method by Schmalzl and Nickels (2006),dramatic vocabulary activity by Cooper (2005), ex-post facto design by Acosta (2005), phoneme-grapheme correspondence in words by Stadie & Vijver (2003) and Graham (1999) Spelling Improvement program improved significantly where as the present study also agrees that decoding and phonetics approach of the present interventions brought average improvement as said by Savage & Hipps (2009) and as in spelling accuracy measure by Nelson and van Meter (2007) .

4.1.3.e Comparison of the Sub Skills of Written Expression Skills (Grammar) of 4th & 5th Class Children Before and After Intervention

The comparison of the sub skills of written Expression skills is presented in the following 4.7 table.

Table 4.7 Comparison of Grammar Skills of Children Before and After Intervention

Skills	Test	N	4 th class			5 th class				%
			No	%	Increase in skill +/-	%	No	%	Increase in skill +/-	
Capitalise, Punctuate	BI	152	131	86	34	22	118	78	36	24
	AI	152	97	64			82	54		
Sentence structure	BI	152	116	76	62	41	116	76	58	38
	AI	152	54	36			58	38		
Articles, Prepositions, con junctions	BI	152	128	84	44	29	121	80	45	30
	AI	152	84	55			76	50		
Active-Passive / Degrees of comparison	BI	152	144	95	50	33	114	75	23	15
	AI	152	94	62			91	60		
Nouns, Verbs, ad verbs, adjectives	BI	152	124	82	80	53	127	84	48	32
	AI	152	44	29			79	52		
Clauses, phrases in simple / complex / compound sentences	BI	152	139	91	57	38	124	82	62	41
	AI	152	82	54			62	41		

The sub skills in Capitalisation& Punctuation of 4th class children showed improvement from a pretest number of 131 (86%) children to a AI test 97 (64%) children. The improvement in skills for 5th class is from a pretest number of 118 (78%) to a posttest number of 82 (54%) children showing the skill deficit.

Skill difference with significant improvement is seen in 34 children (22%) in 4th class and 36 children (24%) due to intervention strategy activities.

The sub skills in Sentence structure of 4th class children showed improvement from a pretest number of 116 (76%) children to a posttest 54 (36%) children. The skills improvement for 5th class is from a pretest number of 116 (76%) to a posttest number of 58 (38%) children showing the skill deficit. Skill difference with significant improvement is seen in 34 children (22%) in 4th class and 36 children (24%) due to intervention strategy activities.

The sub skills in Articles, Prepositions & Conjunctions of 4th class children showed improvement from a pretest number of 128 (84%) children to a posttest 84 (55%) children. The improvement in skills for 5th class is from a pretest number of 121 (80%) to a posttest number of 76 (50%) children showing the skill deficit. Skill difference with significant improvement is seen in 44 children (29%) in 4th class and 45 children (30%) due to intervention strategy activities.

The sub skills in Active-Passive / Degrees of comparison of 4th class children showed improvement from a pretest number of 144 (95%) children to a posttest 94 (62%) children. The improvement in skills for 5th class is from a pretest number of 114 (75%) to a posttest number of 91 (60%) children showing the skill deficit. Skill difference with significant improvement is seen in 50 children (33%) in 4th class and 23 children (15%) due to intervention strategy activities.

The sub skills in Nouns, Verbs, ad verbs, adjectives of 4th class children showed improvement from a pretest number of 124 (82%) children to a posttest 44 (29%) children. The improvement in skills for 5th class is from a pretest number of 127 (84%) to a posttest number of 79 (52%) children showing the skill deficit. Skill difference with significant improvement is seen in 80 children (53%) in 4th class and 48 children (32%) due to intervention strategy activities.

The sub skills in clauses, phrases in simple complex & compound sentences of 4th class children showed improvement from a pretest number of 139 (91%) children to a posttest 82 (51%) children. The improvement in skills for 5th class is from a pretest number of 124 (82%) to a posttest number of 62 (41%) children showing the skill deficit. Skill difference with significant improvement is seen in 57 children (38%) in 4th class and 62 children (41%) due to intervention strategy activities.

The present study agrees that the verb and sentence production (Salis and Edwards (2010) written and spoken narratives (Behrns, Hartelius, & Wengelin, 2009), single word therapy (Beeson, et al. 2008), errorful training in relearning of words (Clare and Jones, 2008), go for it now strategy (Konrad, 2005) Mackie and Dockrell (2004), Fey et al. (2004) showed significant improvement due to intervention.

4.1.3.f Comparison of Sub Skills of Written Expression Skills (Writing Comprehension) of 4th & 5th Class Children Before and After Intervention

The Pretest and Posttest percentages of sub skills of Writing Comprehension of 4th & 5th class children is given below.

Table 4.8 Comparison of Writing Comprehension Skills of Children Before and After Intervention

Skills	Test	Sample			Increase in Skills +/-	%	5th class			Increase in Skills +/-	%
		N	No	%			No	No	%		
Developing hints & Word choice	BI	152	112	74	55	36	25	127	84	28	18
	AI	152	57	38			53	99	65		
Logical Sentences, ideas & content	BI	152	120	79	36	24	41	111	73	10	7
	AI	152	84	55			51	101	66		
Integrating Sentences organizing ideas	BI	152	133	88	24	16	23	129	85	17	11
	AI	152	109	72			40	112	74		
Narrative & expository writing	BI	152	127	84	37	24	18	134	88	22	14
	AI	152	90	59			40	112	74		
Visual/ picture Convention	BI	152	139	91	33	22	10	142	93	22	14
	AI	152	106	70			32	120	79		
Contextual Clues & convention	BI	152	136	89	14	9	2	150	99	16	11
	AI	152	122	80			18	134	88		

The table above indicates that there is improvement in all the children in the Writing Comprehension skills after intervention. Skills wise analysis is presented below.

The sub skills in Developing hints and word choice sentences of 4th class children showed improvement from a pretest number of 112 (74%) children to a posttest 57 (38%) children. The improvement in skills for 5th class is from a pretest number of 127 (84%) to a posttest number of 99 (65%) children showing the skill deficit. Skill difference with significant improvement is

seen in 55 children (36%) in 4th class and 28 children (18%) due to intervention strategy activities.

The sub skills in Logical Sentences, ideas & content sentences of 4th class children showed improvement from a pretest number of 120 (79%) children to a posttest 84 (55%) children. The improvement in skills for 5th class is from a pretest number of 111 (73%) to a posttest number of 101 (66%) children showing the skill deficit. Skill difference with significant improvement is seen in 36 children (24%) in 4th class and 10 children (7%) due to intervention strategy activities.

The sub skills in Integrating Sentences of 4th class children showed improvement from a pretest number of 133 (88%) children to a posttest 109 (72%) children. The improvement in skills for 5th class is from a pretest number of 129 (85%) to a posttest number of 112 (74%) children showing the skill deficit. Skill difference with significant improvement is seen in 24 children (16%) in 4th class and 17 children (11%) due to intervention strategy activities.

The sub skills in organizing ideas & Narrative & expository writing sentences of 4th class children showed improvement from a pretest number of 127 (84%) children to a posttest 90 (59%) children. The improvement in skills for 5th class is from a pretest number of 134 (88%) to a posttest number of 112 (74%) children showing the skill deficit. Skill difference with significant improvement is seen in 37 children (24%) in 4th class and 22 children (14%) due to intervention strategy activities.

The sub skills Visual/ picture comprehension of 4th class children showed improvement from a pretest number of 139 (91%) children to a posttest 106 (70%) children. The improvement in skills for 5th class is from a pretest number of 142 (93%) to a posttest number of 120 (79%) children showing the skill deficit. Skill difference with significant improvement is seen in 33 children (22%) in 4th class and 22 children (14%) due to intervention strategy activities.

The sub skills of contextual clues & conventions of 4th class children showed improvement from a pretest number of 136 (89%) children to a posttest 122 (80%) children. The improvement in skills for 5th class is from a pretest number of 150 (99%) to a posttest number of 134 (88%) children showing the skill deficit. Skill difference with an average improvement is seen in 14 children (9%) in 4th class and 16 children (11%) due to intervention strategy activities. The contextual clues & conventions need more intervention time for better results.

The present study confirmed that Proficiency (Kushki et al., 2011) and spontaneity in writing (Puranik and Al Otaiba, 2012) helps also in proficiency in reading (James and Engelhardt, 2012) by providing opportunities and activities (Langley, 2012) as it is a brain based skill (Richards et al. 2011).

4.2 Quantitative Analysis

4.2.1 Section I

There are different types of writing skills necessary to overcome writing difficulties in any child. Fine Motor Skills which are the underlying base that forms the foundation for all other writing skills, Hand Writing Skills, Spelling Skills and Written Expression Skills which is both Grammar for the syntax of a sentence and comprehension skills which are high end literary skills. The Fine Motor Skills and behavioural skills are discussed in descriptive analysis. This section presents the Mean scores of 4th & 5th class children before and after intervention in each writing skill.

4.2.1.a Comparison of Sub Skills of Hand Writing of 4th & 5th Class Children Before and After Intervention

The analysis of the performance of 4th and 5th class children before and after the intervention are given in the 4.9 table below.

Table 4.9 Comparison of Sub Skills of Hand Writing of Children Before and After intervention

S.No	Sub skills	Test	Sample N	4thclass			Signifi- cance	5thclass				Signifi- cance
				Mean	S.D	t Value		Sample N	Mean	S.D	t Value	
1.	Over all legibility	BI	152	0.36	0.39	9.388	S	152	0.56	0.43	6.076	S
		AI	152	0.72	0.25			152	0.82	0.24		
2.	Capital & small letters mixing	BI	152	0.36	0.22	14.32	S	152	0.42	0.37	10.21	S
		AI	152	0.76	0.25			152	0.82	0.24		
3.	Irregular Letter size & Direction	BI	152	1.12	1.04	3.51	s	152	0.30	0.25	13.58	S
		AI	152	0.82	0.24			152	0.72	0.25		
4.	Reverse Letters & Numbers	BI	152	1.15	1.43	2.814	s	152	0.34	0.23	15.01	S
		AI	152	0.82	0.24			152	0.76	0.25		
5.	Add or omit space	BI	152	0.4	0.58	7.914	S	152	0.32	0.24	17.9	S
		AI	152	0.8	0.25			152	0.80	0.25		
6.	Omission letters & words	BI	152	0.53	0.71	4.963	S	152	0.53	0.41	7.283	S
		AI	152	0.82	0.24			152	0.82	0.24		
7.	Slow and laborious copying	BI	152	0.45	0.78	4.402	S	152	0.62	0.97	1.583	NS
		AI	152	0.75	0.25			152	0.75	0.25		
8.	Strike off/erasals	BI	152	0.67	0.86	1.776	NS	152	0.49	0.46	6.909	S
		AI	152	0.8	0.25			152	0.80	0.25		
9.	Write in all directions	BI	152	0.39	0.66	6.676	S	152	0.56	0.34	7.161	S
		AI	152	0.78	0.25			152	0.78	0.25		
10.	Working in line & margin	BI	152	0.38	0.64	11.57	S	152	0.36	0.34	20.6	S
		AI	152	0.98	0.1			152	0.98	0.1		
11.	Pencil Grip	BI	152	2.83	1.57	33.23	S	152	2.05	0.95	39.07	S
		AI	152	7.96	1.13			152	7.18	1.55		
12.	Paper Position	BI	152	0.86	0.45	17.18	S	152	1.09	0.37	14.22	S
		AI	152	1.66	0.4			152	1.67	0.4		
13.	Alphabet, word and sentence formation	BI	152	0.71	0.56	8.054	S	152	1.40	0.69	19.75	S
		AI	152	2.43	2.56			152	2.59	0.27		

The statistical analysis of the sub skills of the Handwriting Skills are shown in the table above. The effect of intervention on each skill before and after intervention is calculated in **t values** and the results are given below.

1. The overall legibility for 4th and 5th classes scores before and after intervention are significant with 't' value 9.388 and 6.08. The children from both classes showed significant improvement after intervention in over all legibility.
2. The Skills of Capital letter small letter mixing for 4th and 5th classes before and after intervention scores are significant with 't' value 14.32 and 10.21. The children from both classes showed significant improvement after intervention in the Skills of Capital letter small letter mixing.
3. The Letter size and font for 4th and 5th classes scores before and after intervention are significant with 't' value 3.51 and 13.58. The children showed significant improvement after intervention in the irregular Letter size.
4. The Skills of Reverse letters and numbers for 4th and 5th classes scores before and after intervention are significant with 't' value 2.81 and 15.01. In the Skills of Reverse letters and numbers the 4th class children needs to improve on their skill. Whereas 5th class children improved greatly after the intervention.
5. The skills of Add or omit space between letters/words for 4th and 5th classes scores before and after intervention are significant with 't' value 7.914 and 17.9. In the skills of Add or omit space between letters/wordsfor the children from both classes showed significant improvement after intervention.
6. The Omission of letters & words for 4th and 5th classes scores before and after intervention are significant with 't' value 4.96 and 7.28.

The children of both the classes showed great improvement after intervention

7. Slow and laborious copying from board for 4th and 5th class scores before and after intervention are significant with 't' value 4.40 and 1.53. The children from 4th class showed improvement after intervention but 5th class needs some more period of intervention classes to show significant improvement in copying.
8. The Skill deficits of Strike offs/Erasals for 4th and 5th classes scores before and after intervention are significant for 5th class with a t value of 6.91 after intervention. The Skills of Strike offs/Erasals is not significant after intervention for the 4th class children needing some more time practice and improvement.
9. Write in all directions for 4th and 5th classes scores before and after intervention are significant with 't' value 3.51 and 13.58. The children showed the improvement after intervention.
10. The Skills of working inline on margins for 4th and 5th classes are significant with 't' value 11.57 and 20.6. Both classes showed significant improvement in the Skill deficit of working on line in margins before and after intervention.
11. The Skills of pencil grip for 4th and 5th classes scores before and after intervention are significant with 't' value 33.23 and 39.07. The Skills of holding pencil correctly is significantly improved in both the classes.
12. The Skills of paper position and bilateral coordination for 4th class and 5th classes in scores before and after intervention are significant with 't' value 17.18 and 14.22. The intervention in paper position and bilateral coordination helped children a lot in rectifying their sitting posture.

The skills of writing Alphabet, words and sentences for 4th and 5th classes in scores before and after intervention are significant with 't' value 8.05 and 19.75. Children showed great improvement in letter formation, words and sentences.

The mean SD and t value scores of all the hand writing skills of 4th and 5th class showed significant change before and after intervention. **The hypothesis that there is no significant change in the scores of 4th & 5th**

class children after intervention” is rejected. They showed significant improvement after intervention.

The researcher agrees with Talbert Johnson, Salva, Sweeney, & Cooper, 1991 Modlinger, 1983 that the distance between the words and the ability to write on the line (Reisman, 1993) along with the ability to begin and end on a certain margin (Tseng, & Cermak, 1991) are all indicators of writing difficulties. The researcher further agrees that Drill and fine motor activities practice improved Hand writing (Alyssa L. Crouch Jennifer J. Jakubecy, 2007). Berninger et, al (2003) children should write and both digitizer vs conventional evaluation (Sara Rosenblum, 2004).

4.2.1.b Comparison of Sub Skills of Spellings of 4th and 5th Class Children Before and After intervention

The analysis of the performance of the 4th& 5th class children in the Spelling Skills before and after intervention is analysed in the table given below.

Table 4.10 Comparison of Sub Skills of Spellings of Children Before and After Intervention

No	Skills	Test	Sample	4 th class			Sig.	5 th class			Signif- icance
				Mean	S.D	t Value		Mean	S.D	t Value	
1.	Vocabulary Dictation	BI	152	0.95	0.72	91.69	S	1.28	0.77	32.60	S
		AI	152	2.95	0.74			3.11	0.83		
2.	Phonetics	BI	152	0.99	0.72	22.99	S	0.86	0.72	28.78	S
		AI	152	2.30	0.82			2.81	0.68		
3.	Auditory discrimination	BI	152	1.59	0.76	28.86	S	1.28	0.70	24.51	S
		AI	152	3.22	0.77			2.79	0.50		
4.	Visual discrimination	BI	152	0.99	0.63	44.51	S	1.31	0.75	22.64	S
		AI	152	3.22	0.77			2.75	0.52		
5.	Silent & Scrambled words	BI	152	1.47	0.50	36.81	S	1.12	0.75	28.36	S
		AI	152	3.26	0.63			3.76	1.02		
6.	Sylabication & Decoding skills	BI	152	1.13	0.61	28.61	S	1.34	0.70	24.80	S
		AI	152	2.68	0.65			2.78	0.55		
7.	Reading Fluency & Comprehension	BI	152	0.86	0.77	55.65	S	0.90	0.67	30.29	S
		AI	152	2.66	0.72			2.49	0.65		

The above table shows the scores of 4th & 5th class children in all the sub skills of Spellings before and after intervention.

The vocabulary & dictation skills were tested before and after intervention as per the grade level requirement from a list of words taken from their text books. The mean, standard deviation and 't' value show a significant difference with a 't' value 91.69 for 4th and 32.60 for 5th classes before and after intervention. Both classes showed great improvement in vocabulary after intervention.

In the phonetics skills the mean, standard deviation and 't' value show a significant difference between before and after intervention with a 't' value 22.99 for 4th and 28.78 for 5th classes. Both classes showed great improvement in Phonetics after intervention.

In the auditory discrimination skills the before and after intervention mean, standard deviation and 't' value show a significant improvement with a 't' value 28.86 for 4th and 24.51 for 5th classes. Both classes showed great improvement in the auditory discrimination after intervention.

In the visual discrimination skills the mean, standard deviation and 't' value show a significant change with a 't' value 44.55 for 4th and 22.64 for 5th classes before and after intervention. Both classes showed great improvement in the visual discrimination after intervention.

In the skills of silent and scrambled words the mean, standard deviation and 't' value show a significant difference with a 't' value 36.81 for 4th and 28.36 for 5th classes before and after intervention. Both classes showed great improvement after intervention.

In the blending and syllabication & decoding skills the mean, standard deviation and 't' value before and after intervention show a significant improvement with a 't' value 28.61 for 4th and 24.80 for 5th classes. Both classes showed great improvement in the syllabication and decoding skills after intervention.

In the reading fluency and comprehension skills the mean, standard deviation and 't' value before and after intervention show a significant improvement with a 't' value 55.65 for 4th and 30.29 for 5th classes. Both classes showed great improvement in the reading & fluency skills after intervention.

4.2.1.c Comparison of the Written Expression Skills (Grammar) of 4th and 5th class children Before and After Intervention

A comparison of the written Expression Skills of Grammar is presented in the table below.

Table 4.11 Comparison of the Written Expression Skills (Grammar) of Children Before and After Intervention

Grammar skills	Test	Sample	4 th class				5 th class			
			Mean	S.D	t Value	S 1%	Mean	S.D	t Value	S 1%
Capitalisation & Punctuation	BI	152	0.7	0.6	22.0	S	0.6	0.5	16.9	S
	AI	152	1.4	0.8			1.1	0.5		
Sentence structure	BI	152	0.7	0.5	17.8	S	0.7	0.5	13.7	S
	AI	152	1.2	0.5			1.2	0.5		
Articles, Bipoositions & conjunctions	BI	152	0.5	0.5	17.2	S	0.4	0.5	15.4	S
	AI	152	1.0	0.6			0.9	0.5		
Active/passive voice Degrees of omparison	BI	152	0.2	0.4	23.4	S	0.1	0.3	20.9	S
	AI	152	1.0	0.5			0.6	0.3		
Nouns, verbs, adverbs & Adjectives	BI	152	0.5	0.5	19.9	S	0.4	0.5	14.5	S
	AI	152	1.0	0.4			0.9	0.5		
clauses, phrases, simple, complex compound sentences	BI	152	0.2	0.4	22.4	S	0.2	0.3	18.1	S
	AI	152	0.7	0.4			0.7	0.4		

The above table shows the scores of 4th & 5th class children in all the sub skills of Grammar under Written Expression Skills before and after intervention.

The Grammar skills were tested in pretest and posttest as per the grade level requirement from the grammar given in their text books.

In the capitalisation & punctuation skills of the pre & posttest mean, standard deviation and 't' value showed a significant improvement with a 't' value 22.0 for 4th and 16.9 for 5th classes. Both classes showed great improvement in capitalisation & punctuation after intervention.

In the sentence structure skills of the pre & posttest mean, standard deviation and 't' value showed a significant improvement with a 't' value 17.8

for 4th and 13.7 for 5th classes. Both classes showed great improvement in sentence structure after intervention.

In the Articles, Prepositions & Conjunctions of grammar skills the pre & posttest mean, standard deviation and 't' value showed a significant improvement with a **'t' value** 17.2 for 4th and 15.4 for 5th classes. Both classes showed great improvement in Articles, Prepositions & Conjunctions of grammar after intervention.

In the Active Passive voice & degrees of comparison of the grammar skills the mean, standard deviation and **'t' value** showed a significant improvement with a **'t' value** 23.4 for 4th and 20.9 for 5th classes. Both classes showed great improvement in the Active Passive voice & degrees of comparison after intervention.

In the Nouns, Verbs, adverbs, adjectives of the grammar skills the mean, standard deviation and 't' value before and after intervention showed a significant improvement with a **'t' value** 19.9 for 4th and 14.5 for 5th classes. Both classes showed great improvement in the Nouns, Verbs, adverbs, adjectives after intervention.

In the clauses, phrases in simple/complex/compound sentences of the grammar skills the pre & posttest mean, standard deviation and 't' value showed a significant improvement with a 't' value of 22.4 for 4th and 18.1 for 5th classes. Both classes showed great improvement in the Clauses, phrases in simple/complex/compound sentences of the grammar after intervention.

The improvement in the performance of children in Grammar after intervention coincides with the findings of Morsink (1984) who illustrated that teaching the mechanics of writing has a bearing with the increasing written productivity of the child with Dysgraphia. The null hypothesis that **"there is no significant improvement in the sub skills of Written Expression (Grammar) of 4th and 5th class children"** is rejected.

4.2.1.d Comparison of the Written Expression Skills (Comprehension) of 4th and 5th Class Children Before and After Intervention

The mean, SD and 't' values of the children before and after intervention in the sub skills of comprehension are listed below.

Table 4.12 Comparison of the Written Expression Skills (Comprehension) Before and After Intervention

Writing Comprehension Skills	Test	Sample	4 th class				5 th class			
			Mean	S.D	t Value	S -1%	Mean	S.D	t Value	S -1%
Developing hints & word choice	BI	152	1.0	0.8	35.1	S	0.7	0.7	17.7	S
	AI	152	1.6	0.8			1.5	0.8		
Logical sentences & ideas & content	BI	152	1.1	0.7	25.3	S	1.2	0.7	9.1	S
	AI	152	1.7	0.7			1.6	0.6		
Integrating sentences	BI	152	0.6	0.6	28.5	S	0.7	0.7	14.4	S
	AI	152	1.2	0.7			1.2	0.7		
Organizing ideas in narrative & expository writing	BI	152	0.4	0.8	27.5	S	0.3	0.6	12.8	S
	AI	152	1.0	0.9			0.9	0.7		
Visual/Picture comprehension	BI	152	0.3	0.6	27.2	S	0.2	0.4	15.8	S
	AI	152	0.8	0.6			0.7	0.5		
Contextual clues & convention	BI	152	0.1	0.5	9.4	S	0.1	0.2	8.0	S
	AI	152	0.4	0.3			0.3	0.3		

The above table shows the scores of 4th & 5th class children in all the sub skills of Writing Comprehension skills under Written Expression Skills before and after intervention.

The Writing Comprehension skills were tested before and after intervention as per the grade level requirement from the grammar given in their text books.

In the developing hints and word choice of the mean, standard deviation and 't' value before and after intervention showed a significant improvement with a 't' value 35.1 for 4th and 17.7 for 5th classes. Both classes showed great improvement in developing hints and word choice after intervention.

In the logical sentences, ideas and content skills of the mean, standard deviation and 't' value showed a significant improvement with a 't' value 25.3 for 4th and 9.1 for 5th classes before and after intervention. Both classes showed great improvement in logical sentences, ideas and content after intervention.

In the integrating sentences skills the mean, standard deviation and 't' value showed a significant improvement with a 't' value 28.5 for 4th and 14.4 for 5th classes before and after intervention. Both classes showed great improvement in integrating sentences skills after intervention.

In organizing ideas in narrative and expository writing skills the mean, standard deviation and 't' value before and after intervention showed a significant improvement with a 't' value 27.5 for 4th and 12.8 for 5th classes. Both classes showed some improvement in sub skills after intervention.

In the sub skills Visual/ picture comprehension skills the mean, standard deviation and 't' value before and after intervention showed a significant improvement with a 't' value 27.2 for 4th and 15.8 for 5th classes. Both classes showed some improvement sub skills after intervention.

In the sub skills Contextual clues & convention skills the mean, standard deviation and 't' value before and after intervention showed a significant improvement with a 't' value 9.4 for 4th and 8.0 for 5th classes. Both classes showed some improvement in the sub skills after intervention. The Contextual clues & conventions need more intervention time for better results.

The findings on written Expression skills (Comprehension) reject the null hypothesis that **there is no significant difference in the sub skills of Written Expression (Comprehension) skills after intervention.**

The overall view of the analysis of the pre and post mean scores, SD, t values of the sub skills in writing skills before and after intervention shows a significant improvement in the sub skills of Fine Motor Skills, Hand Writing Skills, Spelling Skills, Written Expression Skills and Behaviour Manifestation

Skills. It indicates that the hypothesis that **“there is no significant difference in the pre and post mean scores of children in the sub skills of writing skills”** is rejected. Therefore it is concluded that the intervention strategies helped in acquiring the sub skills in writing skills of 4th&5th class children.

The findings of the study agrees with Fey et al. (2004) who showed significant improvement due to intervention where as the studies like Difficulty in contextual convention writing by Ferouhi (2007) and Kiran (2005) reported that there is still significant difficulty after intervention is the case with the present findings where there is average improvement in children of both the classes.

4.3 Section II

This section presents skill wise Mean, Standard Deviation and ‘t’ values of all the sub skills of writing skills namely Fine Motor Skills, Hand Writing Skills, Spelling Skills and Written Expression Skills which has two components namely Grammar, Writing Comprehension Skills of 4th and 5th class children before and after Intervention.

4.3.1 Comparison of Fine Motor Skills of 4th and 5th Class Children Before and After Intervention

The Mean, Standard Deviation and 't' values of Fine Motor Skills before and after Intervention are given in the table below.

Table 4.13 Comparison of Fine Motor Skills of Children Before and After Intervention

Writing Skills	No of Sample	Testing	4th class				5th Class				
			Mean	SD	t-value	S 5%	Mean	SD	df	t-value	S 5%
FMS	152	BI	30.08	4.99	37.52	S	27.8	3.6	1.0	49.9	S
		AI	44.41	3.27			43.8	2.7			

From the above table it is inferred that the 't' value 37.52 for 4th class 49.9 for 5th class with a df of 1 showed a significant difference at 0.05 level. It indicates that the pre and posttest scores of both the classes differed significantly after the intervention strategies. In the light of this it is concluded that the hypothesis that **“there is no significant difference in the pre and post mean scores of children in Fine Motor Skills of writing skills”** is rejected. Therefore it is concluded that the intervention strategies helped in acquiring fine motor skills for writing skills of 4th& 5th class children.

4.3.2 Comparison of Handwriting Skills of 4th and 5th Class Children Before and After Intervention

The mean, standard deviation and 't' values of hand writing skills of 4th & 5th class children before and after intervention are presented in the table below.

Table 4.14 Comparison of Handwriting Skills of Children Before and After Intervention

Writing Skills	No	Testing	4 th class				5 th class					
			Mean	SD	t-value	S 5%	No	Mean	SD	df	t-value	S 5%
Hand Writing	152	BI	10.2	4.5	21.3	S	152	9.0	2.9	1.0	37.9	S
		AI	20.1	3.2				19.5	1.9			

From the above table it is clear that the 't' value 21.3 for 4th class 37.9 for 5th class with a df of 1 showed a significant difference at 0.05 level. It indicates that the pre and posttest scores of both the classes differed significantly after the intervention strategies. In the light of this it is concluded that the hypothesis that **“there is no significant difference in the pre and post mean scores of children in the Hand Writing Skills of writing skills”** is rejected. Therefore it is concluded that the intervention strategies helped in acquiring hand writing skills for writing skills of 4th & 5th class children.

4.3.3 Comparison of Spelling Skills of 4th and 5th Class Children Before and After Intervention

The comparison of spelling skills of children was analysed and presented in the table.

Table 4.15 Comparison of Spelling Skills of Children Before and After Intervention

Writing Skills	No of Sample	Testing	4th class				5th Class				
			Mean	SD	t-value	S 5%	Mean	SD	df	t-value	S 5%
Spelling Skills	152	BI	7.987	2.81	89.14	S	8.1	2.4	1.0	59.2	S
		AI	20.04	3.08			20.5	2.6			

The above table reveals that the ‘t’ value 89.14 for 4th class 59.2 for 5th class with a df of 1 showed a significant difference at 0.05 level. It indicates that the pre and posttest scores of both the classes differed significantly after the intervention strategies. In the light of this it is concluded that the hypothesis that **“there is no significant difference in the pre and post mean scores of children in the Spelling Skills of writing skills”** is rejected. Therefore it is concluded that the intervention strategies helped in acquiring Spelling Skills for writing skills of 4th&5th class children.

4.3.4 Comparison of Grammar Skills of Written Expression of 4th and 5th Class Children Before and After Intervention

The table below presents the Mean scores of 4th & 5th class children before and after intervention in Written Expression skills (Grammar).

Table 4.16 Comparison of Grammar Skills of Written Expression of Children Before and After Intervention

Writing Skills	Sample	Testing	4 th class				5 th class				
			Mean	SD	t-value	S 5%	Mean	SD	df	t-value	S 5%
Written Expression Grammar	152	BI	2.75	1.44	34.01	S	4.2	1.7	1.0	42.3	S
		AI	9.516	3.19			9.9	2.6			

The above table shows that the 't' value 34.01 for 4th class 42.3 for 5th class with a df of 1 showed a significant difference at 0.05 level. It indicates that the pre and posttest scores of both the classes differed significantly after the intervention strategies. In the light of this it is concluded that the hypothesis that **"there is no significant difference in the pre and post mean scores of children in the Grammar skills of Written Expression Skills"** is rejected. Therefore it is concluded that the intervention strategies helped in acquiring Grammar skills for writing skills of 4th & 5th class children.

4.3.5 Comparison of Writing Comprehension Skills of 4th and 5th Class Children Before and After Intervention

The Written Expression Skills second component is Writing Comprehension. The analysis of the Mean, Standard Deviation and 't' values of Writing Comprehension skills of Written Expression Skills of 4th and 5th class children before and after Intervention is given in the table below.

Table 4.17 Comparison of Writing Comprehension Skills of Children Before and After Intervention

Writing Skills	Sample	Testing	4 th class				5 th class				
			Mean	SD	t-value	S 5%	Mean	SD	df	t-value	S 5%
Written Expression Writing Comprehension	152	BI	4.441	2.6	20.32	S	3.9	2.2	1.0	29.6	S
		AI	10.95	3.98			7.7	2.4			

From the above table it is crystal clear that the 't' value 20.32 for 4th class 29.6 for 5th class with a df of 1 showed a significant difference at 0.05 level. It indicates that the pre and posttest scores of both the classes differed significantly after the intervention strategies. In the light of this it is concluded that the hypothesis that **“there is no significant difference in the pre and post mean scores of children in the Writing Comprehension skills of Written Expression Skills”** is rejected. Therefore it is concluded that the intervention strategies helped in acquiring Writing Comprehension skills for writing skills of 4th& 5th class children.

4.3.6 Comparison of Behaviour Manifestation Skills of 4th and 5th Class Children Before and After Intervention

The analysis of the observation of the children before and after the implementation of the intervention strategies is given in the table.

Table 4.18 Comparison of Children in Behaviour Manifestation Skills Before and After Intervention

Writing Skills	No of sample	Testing	4th class				5th Class				
			Mean	SD	t-value	S 5%	Mean	SD	df	t-value	S 5%
BMS	152	BI	28.3	3.5	50.4	S	27.1	3.3	1.0	1.8	S
		AI	46.9	4.7			26.5	3.8			

From the above table it is observed that the ‘t’ value 50.4 for 4th class 1.8 for 5th class with a df of 1 showed a significant difference at 0.05 level. It indicates that the pre and posttest scores of both the classes differed significantly after the intervention strategies. In the light of this it is concluded that the hypothesis that **“there is no significant difference in the pre and post mean scores of children in the Behaviour Manifestation skills writing skills”** is rejected. Therefore it is concluded that the intervention strategies helped in acquiring good behaviour by the 4th& 5th class children.

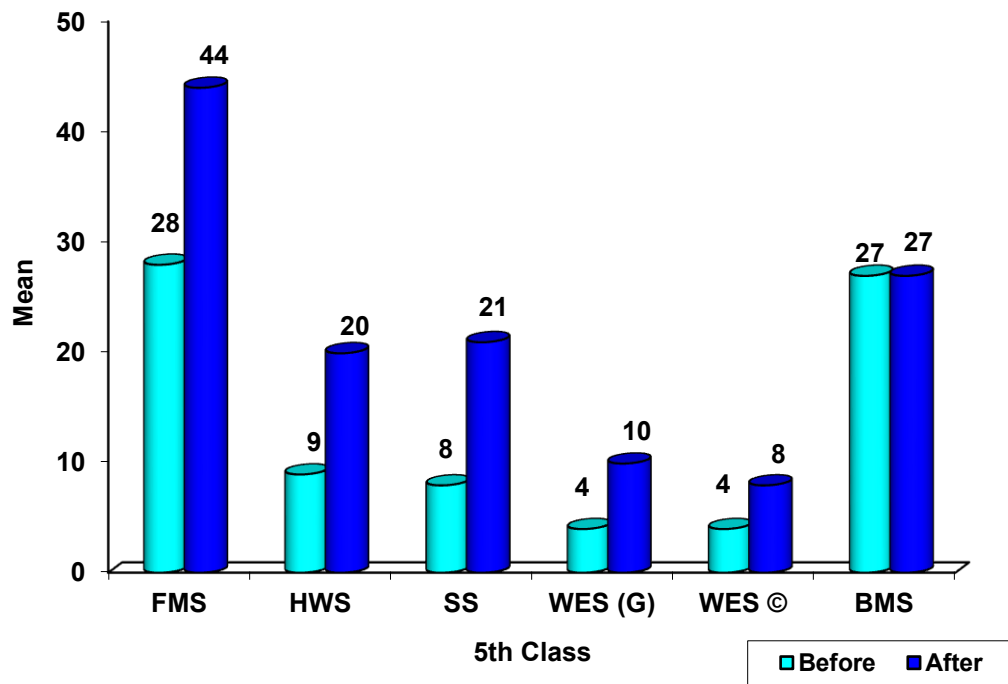
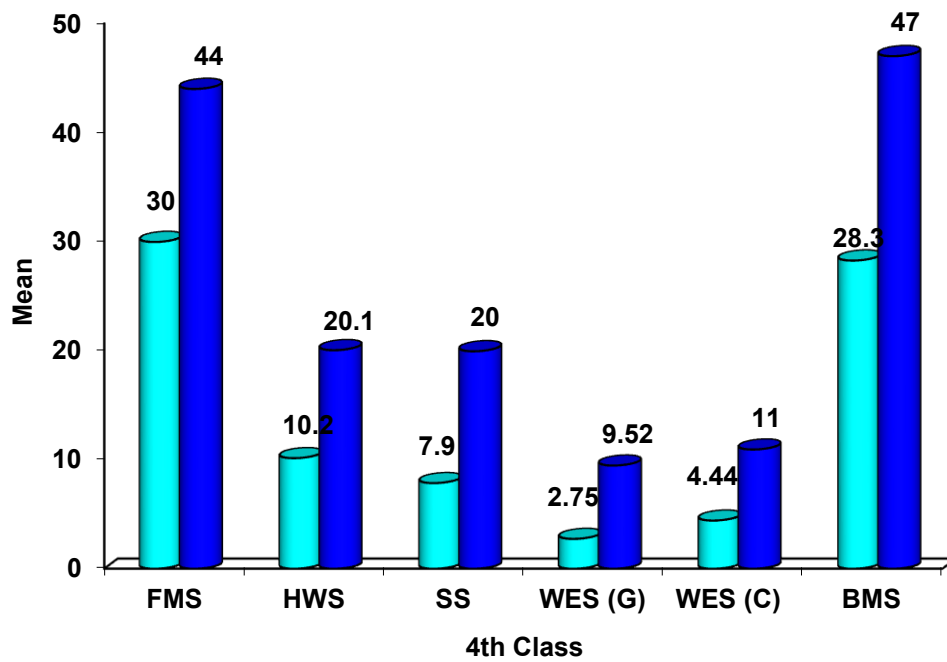


Figure 4.3: Comparison of Mean Scores of Writing Skills of 4th & 5th Class Children Before and After Intervention

4.4 Section III

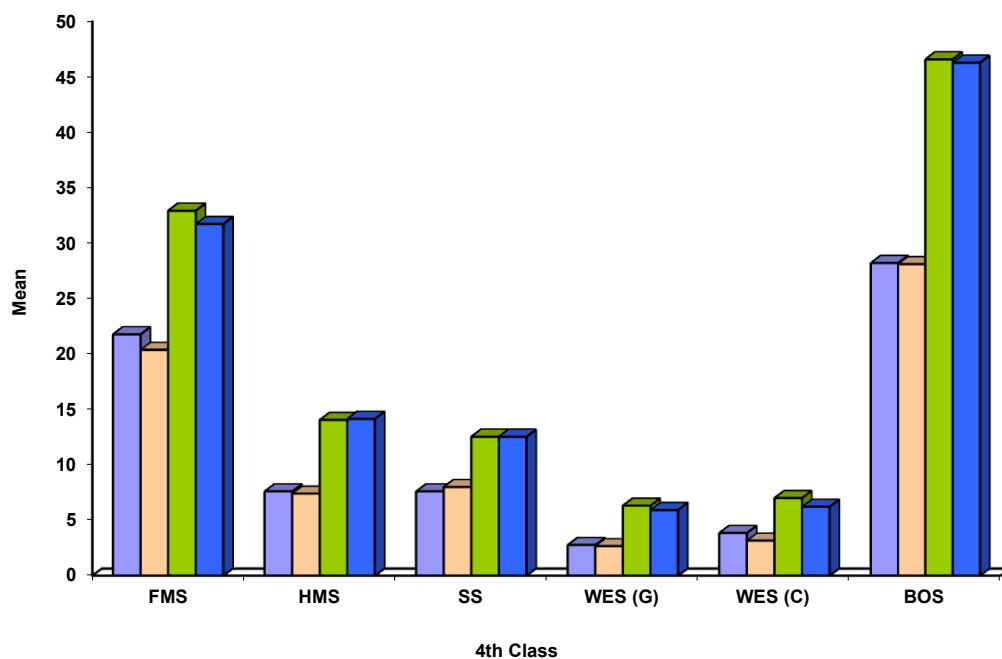
This section presents the variable wise comparison of the mean, standard deviation and 't' values of sub skills of writing skills of 4th and 5th class children before and after Intervention.

4.4.1 Gender Wise Comparison of Sub Skills of Writing of 4th and 5th Class Children Before and After Intervention

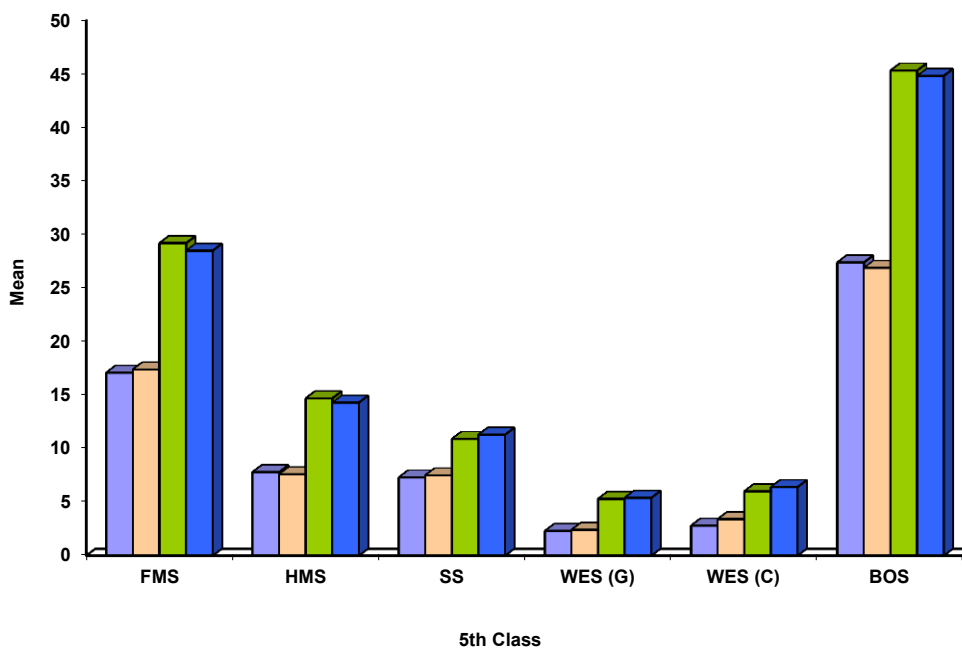
The table below presents the analysis of Mean, Standard Deviation and 't' values of sub skills namely Fine Motor Skills, Hand Writing Skills, Spelling Skills and Written Expression skill of writing skills of 4th and 5th class children before and after Intervention and the significant difference if any in these scores based on the gender of the child.

Table 4.19 Gender wise comparison of Sub Skills of Writing Skills of Children Before and After Intervention

Areas of Sub skills	Test	Gender	Sample 4 th	4th class					Sample 5 th	5th class				
				Mean	Std. Deviation	t value	Signifi- cance	Significance *1%		Mean	Std. Deviation	t value	Signifi- cance	Significance at * 1%
Fine Motor Skills (FMS)	BI	Boys	90	21.9	7.6	1.1	0.3	NS	76	17.1	4.6	0.5	0.6	NS
		Girls	62	20.5	6.7				76	17.4	4.9			
	AI	Boys	90	33.0	7.5	1.0	0.3	NS	76	29.2	5.2	1.1	0.3	NS
		Girls	62	31.8	7.9				76	28.5	4.3			
Hand Writing Skills (HMS)	BI	Boys	90	7.7	2.6	0.4	0.7	NS	76	7.8	2.5	0.5	0.6	NS
		Girls	62	7.5	2.6				76	7.6	2.5			
	AI	Boys	90	14.2	2.5	0.4	0.7	NS	76	14.7	2.8	1.1	0.3	NS
		Girls	62	14.3	2.3				76	14.3	2.6			
Spelling Skills	BI	Boys	90	7.7	2.6	1.0	0.3	NS	76	7.3	2.4	0.7	0.5	NS
		Girls	62	8.1	2.7				76	7.5	2.5			
	AI	Boys	90	12.7	2.9	0.2	0.9	NS	76	10.9	2.5	0.9	0.4	NS
		Girls	62	12.7	3.2				76	11.3	2.5			
WE Skills Grammar Mechanics	BI	Boys	90	2.8	1.5	0.7	0.5	NS	76	2.3	1.4	0.6	0.6	NS
		Girls	62	2.7	1.4				76	2.4	1.5			
	AI	Boys	90	6.4	1.8	1.3	0.2	NS	76	5.3	1.3	0.5	0.6	NS
		Girls	62	6.0	1.8				76	5.4	1.4			
WES Comprehension	BI	Boys	90	3.9	2.4	1.7	0.1	NS	76	2.8	1.8	2.1	0.0	S
		Girls	62	3.2	2.4				76	3.4	2.3			
	AI	Boys	90	7.1	2.4	2.0	0.0	S	76	6.0	2.4	1.2	0.2	NS
		Girls	62	6.3	2.4				76	6.4	2.4			
Behaviour Observation Schedule	BI	Boys	90	28.3	3.3	0.2	0.9	NS	76	27.4	3.1	0.8	0.4	NS
		Girls	62	28.2	3.8				76	26.9	3.4			
	AI	Boys	90	46.6	4.5	0.4	0.7	NS	76	45.3	4.8	0.7	0.5	NS
		Girls	62	46.3	4.0				76	44.8	4.0			



Boys (BI) Girls (BI) Boys (AI) Girls (AI)



Boys (BI) Girls (BI) Boys (AI) Girls (AI)

Figure 4.4 Gender Wise Comparison of Sub Skills of Writing Skills of 4th and 5th Class Children Before and After Intervention

The data from the table indicates the influence of gender on the sub skills of the writing skills. The Mean scores, Standard Deviation and 't' values

of Fine Motor Skills of writing skills of boys and girls before and after Intervention and the difference between pre and posttest scores gender wise were presented.

The Fine Motor Skills of 4th class with a 't' value of 2.26 was significant at 0.025 at 1% significance was significant at 0.025 at 1% and 5th class with a 't' value of 1.4 is not significant at 0.631. The mean score of boys and girls showed that 4th class girls and 5th class boys performed better in response to interventions in Fine Motor Skills.

The Hand Writing Skills 4th class with a 't' value of 0.4 and significance of 1.26 at 0.207 significance was not significant between genders where as for and 5th class with a 't' value of 2.26 and 0.012 was significant where boys with a mean score of 7.0 performed better than girls mean score of 6.7 .

The Spelling Skills of 4th class with a 't' value of 1.1 and 0.242 is not significant even though the mean of the boys performance at 5.01 is more than girls with a mean of 4.5 and 5th class with a 't' value of 0.8 and 0.388 was not significant.

The Written Expression Skills with Grammar of 4th class with a 't' value of 1.2 and 0.35 is not showing an difference in the performance of boys and girls even though the mean of the boys show a slightly more performance at 3.6 than girls with a mean of 3.3. The 5th class did not show significant difference between genders with a 't' value of 0.12 at 0.9 significance. The Written Expression Skills with Writing Comprehension of 4th class with a 't' value of 2.0 with 0.04 shows significant difference between the boys and girls where boys fared better with a mean score of 7.09 and girls mean score was 6.27 the 5th class with a 't' value of 1.08 at 0.282 significance did not show any significant difference between genders. A total of both sections indicate boys performed better with 13.50 where as girls got 12.3 mean score.

The Behaviour Manifestation skills with a 't' value of 0.24 for 4th class and 0.20 for 5th class and significance of 0.809 for 4th and 0.839 for 5th class was not significant between genders.

Overall the analysis indicates there is no significant difference in the performance of children based on gender except in Fine Motor Skills of 4th where girls fared better & Written Expression Skills of 4th where boys fared better than girls. **This agrees with the null hypothesis that "gender has no significant influence on the writing skills of children.**

4.4.2 Comparison of Sub Skills of Writing Skills of 4th and 5th Class Children with respect to Age

The age group of 4th and 5th classes contain 9 yr olds, 10 yr olds and 11 year olds. An analysis of Age wise Mean, Standard Deviation and 'F' values of sub skills of writing skills of 4th and 5th class children before and after Intervention are shown in the table below.

Table 4.20 Comparison of Sub skills of Writing Skills of Children with respect to Age

Areas of Intervention Strategies Sub Skills wise	Age in Years	Sample	4th class								5th class										
			BI				AI					BI					AI				
			Mean	Std. Deviation	F value	**5%, * 1% Significance	Mean	Std. Deviation	F value	**5% * 1% Significance	N	Mean	Std. Deviation	F value	**5%, * 1% Significance	Significance	Mean	Std. Deviation	F value	**5%, * 1% Significance	Significance
Fine Motor Skills	9	95.0	21.5	6.9	0.1	0.8	32.7	7.5	0.2	0.7	0.0	0.0	0.0	20.4	**	S	0.0	0.0	19.8	*	S
	10	57.0	21.1	7.8			32.2	8.1			89.0	15.9	3.0				27.5	2.5			
	11	0.0	0.0	0.0			0.0	0.0			63.0	19.2	6.0				30.8	6.3			
Hand Writing Skills	9	95.0	7.8	2.4	0.6	0.4	14.4	2.4	1.6	0.2	0.0	0.0	0.0	0.6	0.5	NS	0.0	0.0	0.4	0.5	NS
	10	57.0	7.4	2.8			13.9	2.5			89.0	7.8	2.3				14.7	2.5			
	11	0.0	0.0	0.0			0.0	0.0			63.0	7.5	2.7				14.4	3.0			
Spelling Skills	9	95.0	8.1	2.4	1.8	0.2	12.5	2.6	0.6	0.4	0.0	0.0	0.0	7.0	0.0	NS	0.0	0.0	10.1	**	NS
	10	57.0	7.5	2.9			12.9	3.6			89.0	7.8	2.7				11.6	2.7			
	11	0.0	0.0	0.0			0.0	0.0			63.0	6.8	1.9				10.4	1.8			
Written Expression Grammar	9	95.0	2.9	1.3	2.4	0.1	6.8	1.7	22.0	*	0.0	0.0	0.0	0.0	1.0	NS	0.0	0.0	0.0	0.8	NS
	10	57.0	2.5	1.6			5.4	1.8			89.0	2.3	1.4				5.4	1.4			
	11	0.0	0.0	0.0			0.0	0.0			63.0	2.3	1.6				5.4	1.3			
Written Expression Comprehension	9	95.0	4.0	2.5	6.9	**	7.2	2.6	9.1	**	0.0	0.0	0.0	47.9	**	S	0.0	0.0	53.8	*	S
	10	57.0	3.0	2.0			6.0	2.0			89.0	4.0	2.2				7.2	2.4			
	11	0.0	0.0	0.0			0.0	0.0			63.0	1.9	1.1				4.7	1.5			
Behaviour Manifestation Skills	9	95.0	28.4	3.6	0.3	0.6	46.6	4.5	0.4	0.5	0.0	0.0	0.0	0.5	NS	NS	0.0	0.0	0.9	0.4	NS
	10	57.0	28.1	3.3			46.2	4.0			89.0	27.0	3.4				44.8	4.5			
	11	0.0	0.0	0.0			0.0	0.0			63.0	27.4	3.1				45.5	4.3			

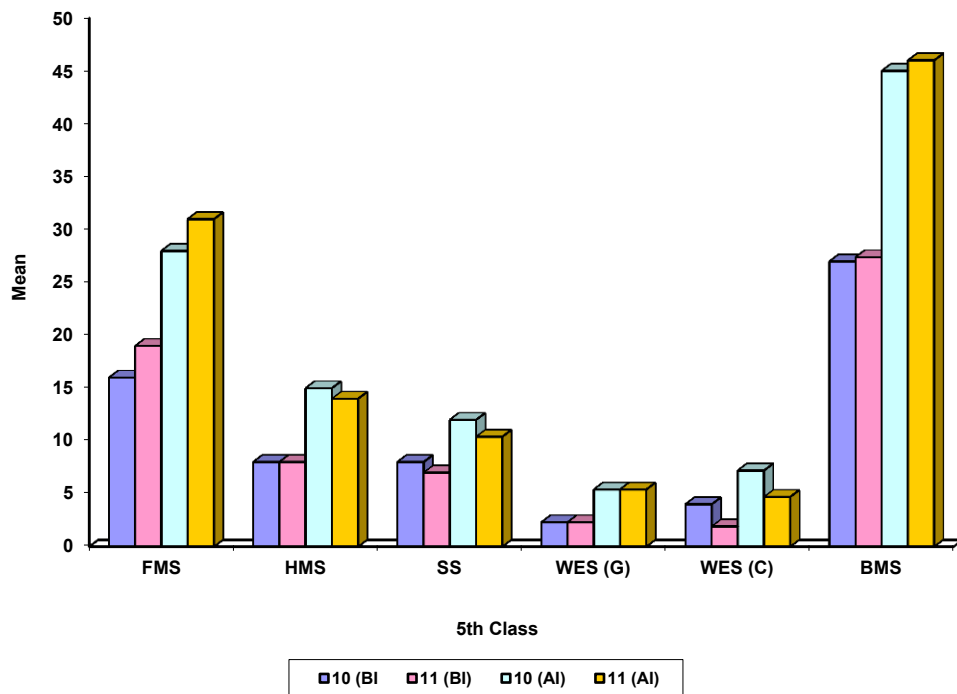
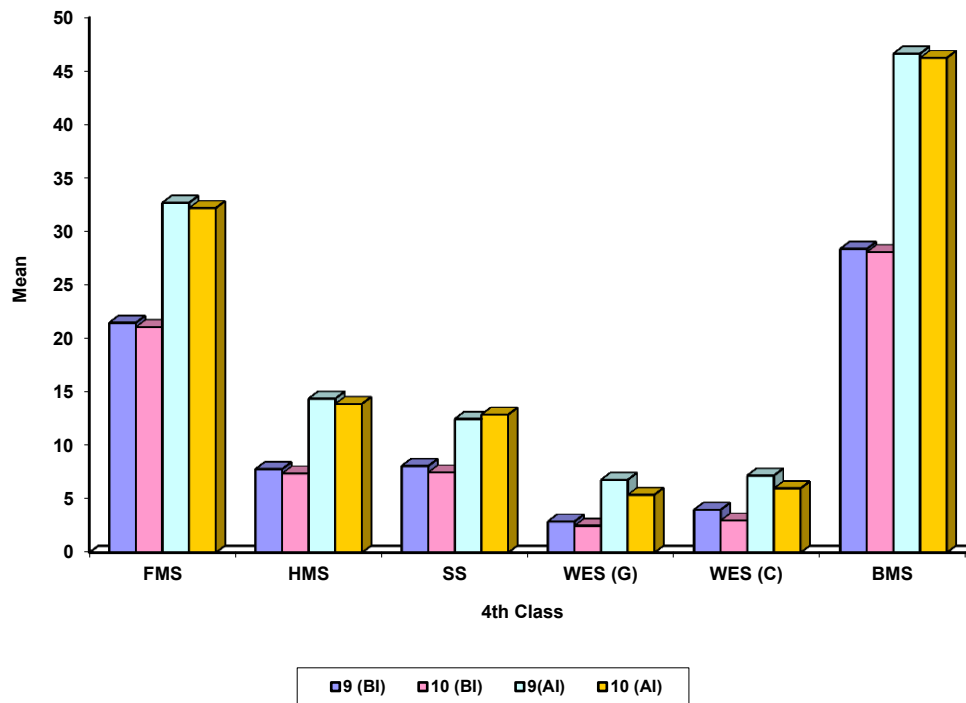


Figure 4.5 Age Wise Comparison of Sub skills of Writing Skills of 4th and 5th Class Children Before and After Intervention

The data reveal that the 9, 10 and 11 year olds studying 4th class did not show significant difference before intervention in the F values of Fine Motor Skills (0.08), Hand Writing Skills(0.62). Spelling Skills (1.84), Written Expression Skills (2.43), Writing Comprehension (6.88) and behaviour Manifestation skills (0.29) and 5th class did showed significant difference before intervention in the F values of Fine Motor Skills (20.4) where the 11 yr old is doing better than 10yr old at 5% significance, did not show significant difference in their scores in Hand Writing Skills (0.56). Spelling Skills (7.0), Written Expression Skills, Grammar (0.1), and behaviour Manifestation skills (0.48). It showed significant difference writing Comprehension (47.9) where 10yr olds did better than 11 yr old age group in the writing skills before intervention.

The age group did not show significant difference in the performance of Fine Motor Skills with an 'F' values of 0.151 and 0.698 significance for 4th class and age is significant for 5th class with an 'F' value of 19.8 at 1% significance. The 11yr olds improved significantly with a mean score of 30.8 over 10 yr olds with a mean of 27.48.

The age group did not show significant difference in the performance of Hand Writing Skills in both the classes with 'F' values of 4th class at 1.64 and 5th class at 0.43.

The age group did not show significant difference in the performance of Spelling Skills with an 'F' values of 0.63 and 0.43 significance for 4th class and it is significant for 5th class with an 'F' value of 10.08 at 5% significance where the 10yr olds improved significantly with a mean score of 11.6 over 10 yr olds with a mean of 10.38.

The age group did not show significant difference in the performance of Spelling Skills with an 'F' values of 0.63 and 0.43 significance for 4th class and it is significant for 5th class with an 'F' value of 10.08 at 5% significance where the 10yr olds improved significantly with a mean score of 11.6 over 10 yr olds with a mean of 10.38.

The age group in 4th class showed significant difference in the Grammar of Written Expression Skills with an 'F' values of 21.96 at 1% significance where the 9 yr old performed better with 6.75 mean score than 10 yrs at 5.42. 5th class did not show significant difference at 0.04 F value and 0.842 significance.

The age group in 4th class showed significant difference in the Writing Comprehension of Written Expression Skills with an 'F' values of 9.10 at 5% significance where the 9 yr old performed better with 7.21 mean score than 10 yrs at 6.00. The 5th class showed significant difference at F value 53.84 and 1% significance where the 10 yr olds performed better with mean scores of 7.19 than 11 yr old who got 4.69 mean scores.

There is no significant difference shown in the Behaviour Manifestation skills in both the classes where 4th with an F value of .0385 with 0.536 significance and 5th with an F value of 0.85 with 0.356 in the three age groups.

The findings of the research contradicts the null hypothesis that **“there is no significant difference in the scores of 4th and 5th class children based on the age”** is rejected. However all the age groups benefited and improved their performance after intervention.

4.4.3 Comparison of Sub Skills of Writing Skills of 4th and 5th Class Children with Respect to Locality

The influence of locality on the Mean, Standard Deviation and 't' values of sub skills of writing skills of 4th and 5th class children before and after Intervention is analysed. The data is presented in the table below.

Table 4.21 Comparison of Sub Skills of Writing with Respect to Locality

Areas of Sub skills	Test	Locality	Sample N	4 th class					Sample N	5 th class				
				Mean	Std. Deviation	t-value	Significance			Mean	Std. Deviation	t-value	Significance	
Fine Motor Skills (FMS)	BI	Urban	79	26.8	5.1	15.6	0.0		76	15.6	3.4	-5.0	0.0	
		Rural	73	15.4	3.8			S	76	18.9	5.3			NS
	AI	Urban	79	37.9	5.1	13.5	0.0		76	27.3	3.3	-4.4	0.0	
		Rural	73	26.6	5.3			S	76	30.4	5.5			NS
Hand Writing Skills (HMS)	BI	Urban	79	7.8	2.6	0.6	0.5		76	7.6	2.3	0.3	0.8	
		Rural	73	7.5	2.6			NS	76	7.7	2.7			NS
	AI	Urban	79	14.4	2.5	0.9	0.4		76	14.4	2.3	0.6	0.6	
		Rural	73	14.1	2.4			NS	76	14.7	3.1			NS
Spelling Skills	BI	Urban	79	7.7	2.7	1.2	0.2		76	8.5	2.5	5.8	0.0	
		Rural	73	8.1	2.5			NS	76	6.3	1.9			S
	AI	Urban	79	12.5	3.0	1.0	0.3		76	12.2	2.6	6.1	0.0	
		Rural	73	13.0	3.1			NS	76	10.0	1.7			S
WE Skills Grammar Mechanics	BI	Urban	79	2.7	1.5	0.3	0.8		76	2.4	1.4	0.3	0.8	
		Rural	73	2.8	1.4			NS	76	2.3	1.6			NS
	AI	Urban	79	6.3	1.8	0.1	0.9		76	5.4	1.4	0.3	0.7	
		Rural	73	6.2	1.9			NS	76	5.4	1.3			NS
WES Comprehension	BI	Urban	79	3.7	2.4	0.6	0.6		76	4.2	2.3	7.1	0.0	
		Rural	73	3.5	2.4			NS	76	2.1	1.2			S
	AI	Urban	79	6.9	2.4	0.5	0.6		76	7.4	2.4	7.0	0.0	
		Rural	73	6.6	2.5			NS	76	4.9	1.6			S
Behaviour Observation Schedule	BI	Urban	79	28.1	3.4	0.5	0.6		76	27.1	3.3	0.0	1.0	
		Rural	73	28.4	3.6			NS	76	27.1	3.3			NS
	AI	Urban	79	46.7	4.3	0.6	0.6		76	45.1	4.4	0.0	1.0	
		Rural	73	46.3	4.3			NS	76	45.1	4.4			NS

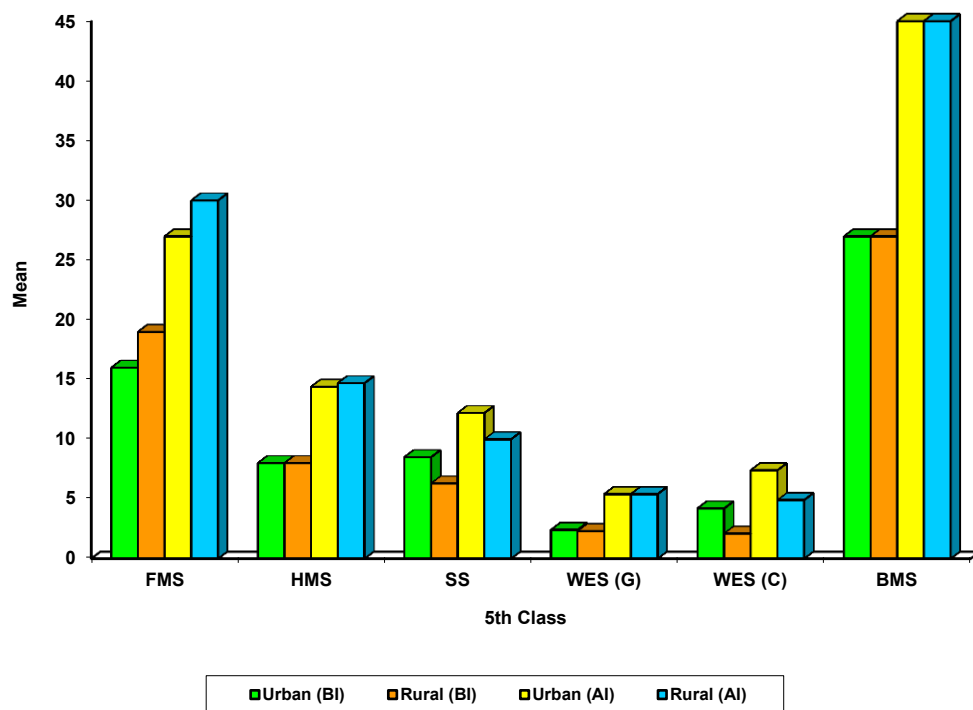
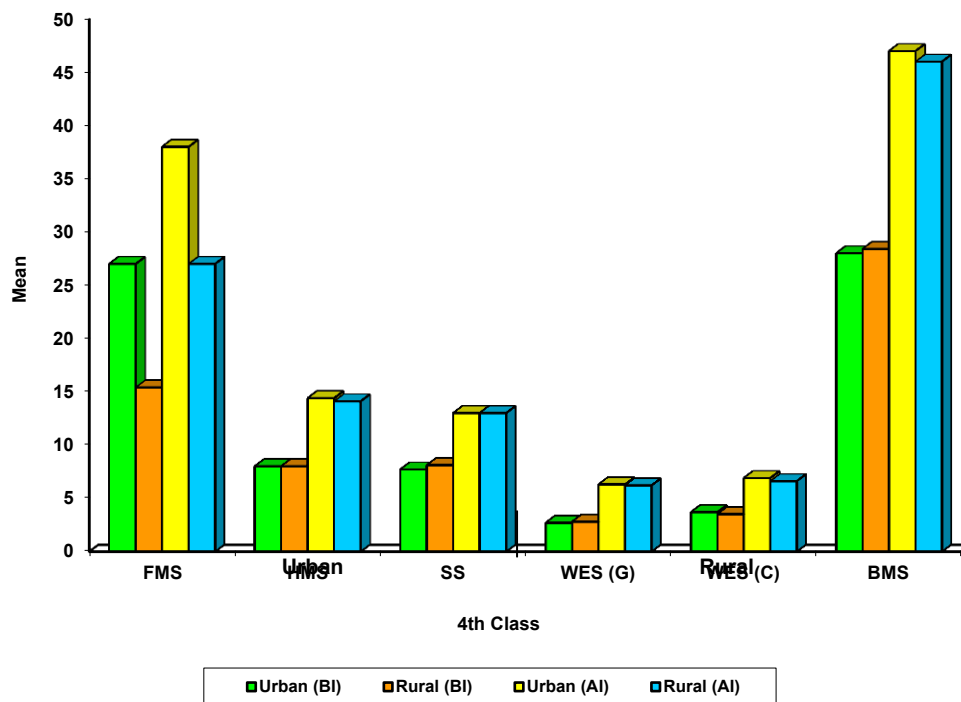


Figure 4.6 Locality Wise Comparison of Sub Skills of Writing Skills of 4th and 5th Class Children Before and After Intervention

The data given in the table indicated that children in both the localities got significant improvement in the scores after intervention strategies are implemented. To find out which locality has a bearing on the sub skills in writing skills the data was analysed sub skills wise.

The Mean scores, Standard Deviation and 't' values of Fine Motor Skills of writing skills of urban type and rural type before and after Intervention and the difference between pre and posttest scores gender wise were presented.

The Fine Motor Skills of 4th class with a 't' value of 4.4 was significant after intervention at 0.025 at 1% significance and 5th class with a 't' value of 1.4 is not significant. The mean score of 4th class urban type (37.9) and rural type (26.6) shows that urban type performed better in Fine motor skills than rural type.

The Hand Writing Skills of 4th class with a 't' value of 0.3 and significance of 0.8 was not significant between locality where as for and 5th class with a 't' value of 1.4 and 0.2 was not significant with locality have no bearing on the Hand Writing Skills of 4th and 5th class children.

Spelling Skills of 4th and 5th classes with a 't' value of 0.01 and significance of 1.0 for 4th, a 't' value of 0.5 and significance of 0.7. In 5th class there is significant difference in the 't' value 6.1 at 1% where the locality of school has significant influence on the Spelling Skills with urban type with a mean score of 12.2 and rural type with a mean score of 10.0 clearly indicated that urban type fared well in Spelling Skills in 5th class.

The Written Expression Skills with Grammar of 4th class with a 't' value of 0.4 and 0.35 is not showing any difference in the performance of urban type and rural type The 5th class did not show significant difference between locality with a 't' value of 0.7 at 0.5 significance. Thus locality does not have influence over the Grammar skills.

The Written Expression Skills with Writing Comprehension of 4th class with a 't' value of 0.01 with 1% significance shows significant difference

between the urban type and rural type. 5th class with a 't' value of 7.1 at 1% significance showed significant difference based on locality. The urban with a mean score of 7.4 showed significant difference with rural 4.9 mean score there by urban type fared better in Written Expression Skills than rural in both 4th and 5th classes.

The Behaviour Manifestation skills with a 't' value of 1.1 for 4th class and 0.01 for 5th class and significance of 0.3 for 4th and 1.0 for 5th class was not significant based on locality.

Overall there is influence of locality on the writing skills of children. So the null hypothesis that **“there is no significant difference in the scores of children based on the locality”** is rejected.

4.4.4 Family Income Wise Comparison of Sub Skills of Writing Skills of 4th and 5th Class Children Before and After Intervention

The following table is compiled with the data from the scores of children analysed as in table 4.22.

Table 4.22 Comparison of Sub Skills with Respect to Family Income

Areas of Sub skills	Income	N	4 th class B I				Significance	N	4 th class AI				Significance	N	5 th class BI				Significance	N	5 th class AI				Significance
			Mean	Std. Deviation	F value				Mean	Std. Deviation	F value				Mean	Std. Deviation	F value				Mean	Std. Deviation	F value		
Fine Motor Skills	High	73	23.3	7.1	5.7	0.004*	NS	73	34.1	7.8	3.1	0.0	NS	76	16.8	4.8	0.8	0.5	NS	76	28.6	5.1	0.6	0.5	NS
	Middle	64	19.3	7.0				65	30.8	7.5				57	17.5	4.4				57	29.4	4.7			
	Low	15	20.5	7.2				14	32.1	6.2				19	18.3	5.6				19	28.2	3.7			
Hand Writing Skills	High	73	7.9	2.5	1.9	0.6	NS	73	14.4	2.3	1.0	0.4	NS	76	7.8	2.5	0.8	0.5	NS	76	14.7	2.7	1.3	0.3	NS
	Middle	64	7.5	2.6				65	14.3	2.5				57	7.3	2.4				57	14.1	2.6			
	Low	15	6.6	2.7				14	13.4	2.3				19	7.9	2.7				19	15.1	3.2			
Spelling Skills	High	73	8.1	2.5	0.5	0.6	NS	73	12.8	3.2	0.4	0.7	NS	76	7.6	2.2	1.0	0.4	NS	76	11.3	2.2	0.6	0.5	NS
	Middle	64	7.6	2.7				65	12.4	2.8				57	7.3	2.6				57	11.1	2.7			
	Low	15	7.9	2.8				14	13.1	3.4				19	6.7	3.0				19	10.6	2.7			
Written Expression Grammar	High	73	2.7	1.5	0.1	0.9	NS	73	6.2	1.9	0.9	0.4	NS	76	2.4	1.5	0.4	0.6	NS	76	5.4	1.4	0.1	0.9	NS
	Middle	64	2.8	1.5				65	6.4	1.8				57	2.4	1.4				57	5.4	1.3			
	Low	15	2.8	1.1				14	5.8	1.6				19	2.0	1.7				19	5.3	1.5			
Written Expression Comprehension	High	73	3.8	2.5	0.9	0.4	NS	73	6.8	2.6	0.3	0.7	NS	76	3.3	2.2	1.1	0.3	NS	76	6.4	2.7	0.9	0.4	NS
	Middle	64	3.4	2.2				65	6.6	2.2				57	3.1	2.1				57	6.0	2.1			
	Low	15	4.2	2.8				14	7.2	2.9				19	2.5	1.7				19	5.6	2.0			
Behaviour Manifestation Skills	High	73	28.0	3.6	1.1	0.3	NS	73	46.6	4.7	0.3	0.7	NS	76	27.0	3.3	0.3	0.7	NS	76	44.8	4.5	0.4	0.7	NS
	Middle	64	28.8	3.4				65	46.5	4.2				57	27.2	3.3				57	45.1	4.7			
	Low	15	27.7	3.3				14	45.6	2.8				19	27.7	3.1				19	45.8	3.5			

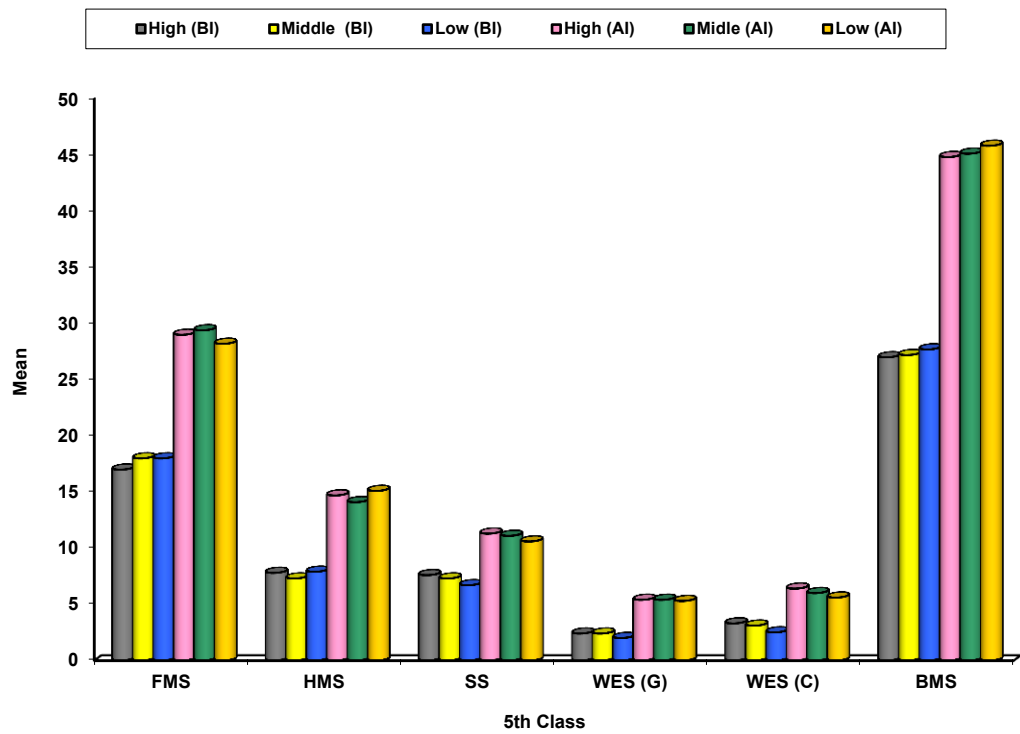
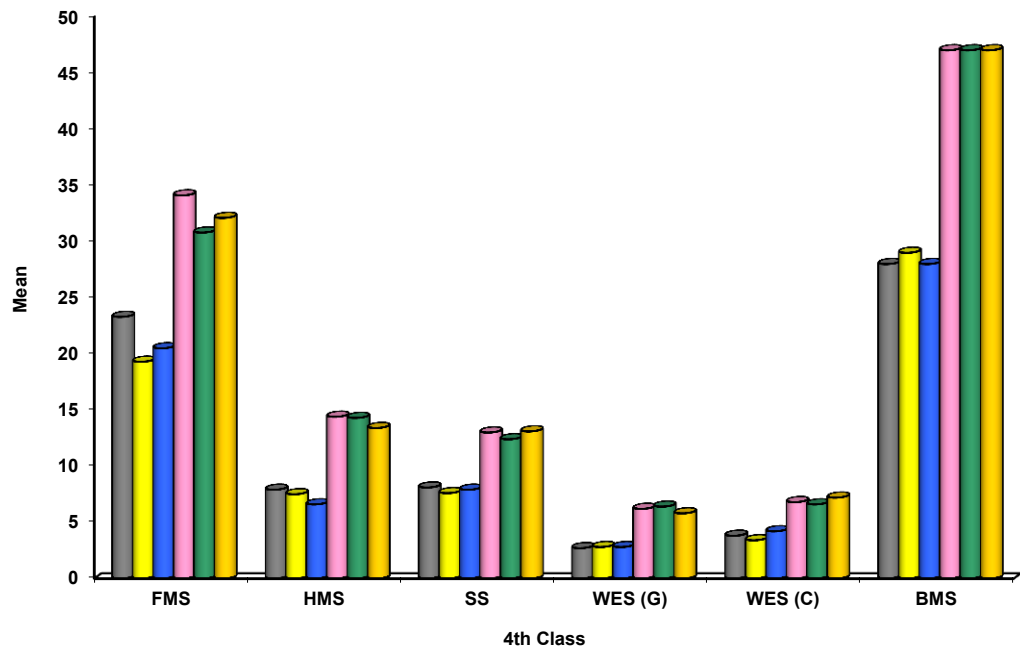


Figure 4.7 Family Income Wise Comparison of 4th and 5th Class Children in Sub Skills of Writing Skills Before Intervention

The table 4.22 indicates that there is no significant influence of family income before and after intervention in any of the sub skills of writing skills.

The Fine Motor Skills showed no significant influence of family income on 4th class with an F value of 5.738 and 3.094 and on 5th class F value is 0.77 & 0.647 before and after intervention respectively.

The Hand Writing skills showed no significant influence of family income on 4th class with an F value of 1.87 and 0.95 and on 5th class F value is 0.77 & 1.31 before and after intervention respectively.

The Spelling skills showed no significant influence of family income on 4th class with an F value of 0.53 and 0.95 and on 5th class F value is 0.96 & 1.60 before and after intervention respectively .

The Written Expression skills showed no significant influence of family income on Grammar Skills of 4th class with an F value of 0.11 and 0.89 and on 5th class F value is 0.44 & 1.11 before and after intervention respectively.

The Written Expression skills showed no significant influence of family income on comprehension Skills of 4th class with an F value of 0.86 and 0.35 and on 5th class F value is 1.12 & 0.86 before and after intervention respectively.

The Behaviour Manifestation skills showed no significant influence of family income on 4th class with an F value of 1.09 and 0.34 and on 5th class F value is 0.32 & 0.35 before and after intervention respectively.

4.5 Section IV

4.5.1 Analysis of Variance (ANOVA) of the Sub Skills with Reference to the Class

Section V presents the analysis of variance (ANOVA) of the writing skills of 4th and 5th class children with reference to their interaction with variables. Multiple comparison s with respect to different variables (ANCOVA). Analysis of

posttest scores of writing skills based on variables by using ANCOVA and for multiple Comparison among the variables by using Scheffe's Test.

Table 4.23 ANOVA for Writing Skills with Respect to 4th and 5th Class Children

Skills	Tests	No	Source of variance	df	SSy.x	MSSy.x	F Value	Signif - icanc e ** 1% * 5%
Fine Motor Skills FMS	BI	304	Covariate-FMS-Pretest	1	1105.012	1105.012	197.05	**
	AI	304	Between Classes	1	0.041	0.041	0.017	NS
Hand Writing Skills HWS	BI	304	Covariate-HWS-Pretest	1	2138.473	2138.473	276.4	**
	AI	304	Between Classes	1	0.533	0.533	0.069	NS
Spelling Skills SS	BI	304	Covariate-SS-Pretest	1	4242.000	4242.000	1,000.80	**
	AI	304	Between Classes	1	15.299	15.299	3.722	NS
Written Expression (WES) Sec-1 Grammar	BI	304	Covariate-WES-I-Pretest	1	2582.000	2582.000	1,068	**
	AI	304	Between Classes	1	49.760	49.760	22.303	**
WES-Section II Writing Comprehension	BI	304	Covariate-WES-II-Pretest	1	2684.800	2684.800	476.7	**
	AI	304	Between Classes	1	320.100	320.100	68.68	**
Behaviour manifestation Skills (BMS)	BI	304	Covariate-BMS-Pretest	1	2697.200	2697.200	226.3	**
	AI	304	Between Classes	1	122.760	122.760	10.473	**

* 1% significance, ** 5% significance

The above table clearly indicates that there is significant improvement in the performance of 4th & 5th class children based on the sub skills with significant 'F' values for Fine Motor Skills 197.05, Hand Writing Skills 276.4, Spelling Skills 1,000.80 and behavioural skills with 226.3 F value indicating that intervention strategy helped the children to improve in the skill deficits which is

not significant between classes. Written Expression Skills with grammar and Writing Comprehension showed significant improvement with F values 1,068 & 476.7. The interaction effect between classes showed a significant difference. To see what analysis of covariance ANCOVA test was undertaken.

1.5.2 ANCOVA for Fine Motor Skills with Respect to Class

ANCOVA for Fine Motor Skills with respect to class is shown in the table below.

Table 4.24 ANCOVA for Fine Motor Skills with Respect to Class

Source of variation	SSy.x	df	MSSy.x	F	Sig.	
Covariate-Fine Motor Skills Pre - Total	8362.754	1	8362.754	629.918	.000	s
Between Class	1.553	1	1.553	.117	.733	ns
Interaction-Class vs Class	5500.888	1	5500.88	414.35	0	s
Within Class	3996.056	300	13.276			
Total	299533.000	303				

The ANCOVA test clearly showed that the 4th and 5th class differed in their performance where 4th class with a pretest mean of 2.76 showed great improvement with a posttest mean of 6.257 did better than 5th class with a pretest mean of 3.13 got a posttest mean of 6.158. This coincides with Graham (2001) that early intervention is better to overcome writing difficulties.

The ANCOVA clearly showed that the 4th and 5th class differed significantly in their performance as the F value is 199.07 with a df of 1 which is significant meaning the mean score between 4th class and 5th class differed significantly when pretest level scores were taken as co variate, where 4th class with a pretest mean of 28.2 showed great improvement with a posttest mean of 46.47 did better than 5th class who with a pretest mean of 27.1 got a posttest mean of 45.06. In this context the null hypothesis that **“there is no significant influence of class on the writing skills of children is rejected”**. It is therefore concluded that the difference in class has a bearing on the

performance of children in Written Expression Skills and behaviour manifestation skills.

4.5.2 The Analysis of Variance (ANOVA) of the Writing Skills with Reference to their Interaction with the Gender

This section deals the variation of pretest and posttest mean scores of writing skills due to interaction with the gender of the children. The pretest score of each writing skill is considered as the covariate ANOVA is used.

Table 4.25 ANOVA for Writing Skills of Children with Respect to Gender

Skills	Tests	No	Source of variance	d f	SSy.x	MSSy.x	F Value	Significance ** 1% * 5%
Fine Motor Skills FMS	BI	304	Covariate-FMS-Pretest	1	1105.012	1105.012	197.05	**
	AI	304	Between Genders	1	0.003	0.003	0.001	NS
Hand Writing Skills HWS	BI	304	Covariate-HWS-Pretest	1	2138.473	2138.473	276.4	**
	AI	304	Between Genders	1	17.395	17.395	2.248	NS
Spelling Skills SS	BI	304	Covariate-SS-Pretest	1	4242.000	4242.000	1,000.80	**
	AI	304	Between Genders	1	3.612	3.612	0.852	NS
Written Expression (WES)Sec-1 Grammar	BI	304	Covariate-WES-I-Pretest	1	2582.000	2582.000	1,068	**
	AI	304	Between Genders	1	0.041	0.041	0.017	NS
WES-Section II Writing Comprehension	BI	304	Covariate-WES-II-Pretest	1	2684.800	2684.800	476.7	**
	AI	304	Between Genders	1	0.251	0.251	0.045	NS
Behaviour manifestation Skills(BMS)	BI	304	Covariate-BMS-Pretest	1	2697.200	2697.200	226.3	**
	AI	304	Between Genders	1	2.603	2.603	0.218	NS

The above table clearly indicates that there is significant difference at 1% significance in the performance of 4th & 5th class boys and girls based on the gender with significant 'F' values for Fine Motor Skills 197.05, Hand Writing Skills 276.4, Spelling Skills 1,000.80, Written Expression Skills with grammar and Writing Comprehension showed significant improvement with F values

1,068 & 476.7, behaviour manifestation skills showed improvement with an F value of 226.3. The mean scores of boys with 14.7 and the girls 14.3 shows the boys improved slightly better than girls in all the skills. The findings show that the null hypothesis that **“there is no significant difference in the post scores of writing skills between boys and girls”** is accepted. This shows that both boys and girls improved significantly after intervention.

4.5.3 The Analysis of Variance of the Writing Skills with Respect to Age

To find the influence of age on the pre and posttest s mean scores of writing skills by considering the respective pretest scores as Covariate ANCOVA is used as shown in the table given below.

Table 4.26 ANOVA for Writing Skills with Respect to Age Groups

Skills	Tests	No	Source of variance	df	SSy.x	MSSy.x	F Value	Significance ** 1% * 5%
Fine Motor Skills FMS	BI	304	Covariate-FMS-Pretest	1	1105.012	1105.012	197.05	**
	AI	304	Among Age grps	1	54.610	27.308	5.064	**
Hand Writing Skills HWS	BI	304	Covariate-HWS-Pretest	1	2138.473	2138.473	276.4	**
	AI	304	Among Age grps	1	3.564	1.782	0.232	NS
Spelling Skills SS	BI	304	Covariate-SS-Pretest	1	4242.000	4242.000	1,000.80	**
	AI	304	Among Age grps	2	84.970	42.485	10.529	**
(WES) Grammar	BI	304	Covariate-WES-I-Pretest	1	2582.000	2582.000	1,068	**
	AI	304	Among Age grps	1	30.237	15.118	6.561	**
WES Writing Comprehension	BI	304	Covariate-WES-II-Pretest	2	2684.800	2684.800	476.7	**
	AI	304	Among Age grps	1	155.380	77.694	14.823	**
Behaviour manifestation Skills(BMS)	BI	304	Covariate-BMS-Pretest	2	2697.200	2697.200	226.3	**
	AI	304	Among Age grps	1	37.903	18.951	1.593	NS

The table indicates that there is significant difference at 1% significance in the performance of 4th & 5th class children based on the age group with significant 'F' values for Fine Motor Skills 197.05 where the children showed great improvement after intervention.

The table showed that there is significant change before and after Intervention. Hand Writing Skills 276.4 improved significantly, Spelling Skills 1,000.80, Written Expression Skills with grammar and Writing Comprehension showed significant improvement with F values 1,068 & 476.7, behaviour manifestation skills showed improvement with an F value of 226.3. There is significant difference between age groups in most of the skills. To find out which age group differed significantly ANCOVA is used. For, spellings and Writing Comprehension skills.

4.5.3.1 ANCOVA for Spelling Skills with Respect to of Age

The table below presents the analysis of co variation of spelling skills in interaction with age.

Table 4.27 ANCOVA for Spelling Skills with Respect to Age

Source of variation	SSy.x	df	MSSy.x	F	Sig.	
Covariate-Spelling Skills Pre -Total	1236.935	1	1236.935	376.790	.000	s
Between Class	84.657	1	84.657	25.788	.000	s
Between Age	33.219	2	16.610	5.060	.007	s
Interaction-class vs	.000	0				
Within class	981.565		3.283			
Total	45555.500					

The ANCOVA shows that there is significant difference between classes and age of the children (F value 25.7) and between age groups also (F value 5.06) in Spelling Skills. To what differed significantly **Scheffe's** test is used.

4.5.3.2 Scheffe's test Between Spelling Skills and Age

Scheffe's test is conducted to see what age group differed significantly to the intervention.

Table 4.28 Scheffe's test Between Spelling Skills and Age

Alpha=0.050 Error Term=S(AB) DF=601 MSE=5.393128 Critical Value=2.45386

(I)	(J)	Mean Difference	Std	Sig.	95%	
					Lower Bound	Upper Bound
9	10	.4035	.3627	.539	-.489	1.296
	11	2.1664	.4471	.000	1.067	3.266
10	9	-.4035	.3627	.539	-1.296	.489
	11	1.7629	.4148	.000	.743	2.783
11	9	-2.1664	.4471	.000	-3.266	-1.067
	10	-1.7629	.4148	.000	-2.783	-.743

Scheffe's test reveals that 9yr old of 4th class scored significantly differently from 10th class and 10th class from 4th & 5th class 9 yr & 11 yr olds, 11yr old scored differently from 9 yr & 11 yrs olds of both the classes.

4.5.3.3 ANCOVA of Comprehension Skills with Respect to Age

The table below showed the ANCOVA of comprehension skills to see the co variance of comprehension skills with respect to 9 yrs, 10yrs and 11 yr old children of 4th and 5th classes.

Table 4.29 ANCOVA for Comprehension-skills with Respect to Age

Source of variation	SSy.x	df	MSSy.x	F	Sig.	
Covariate-Comprehension Pre -Total	1164.1	1.0	1164.1	1040.0	0.0	s
Between Class	2.2	1.0	2.2	1.9	0.2	ns
Between Age	11.0	2.0	5.5	4.9	0.0	s
Interaction-class vs Age	0.0	0.0	.			
Within class	334.7	299.0	1.1			
Total	14483.0	303.0				

The ANCOVA for Writing Comprehension with respect to the age group of the children showed significant difference between ages with an F value of 4.9. To see how did it differ Scheffe's multiple comparison test between age and Writing Comprehension is used.

4.5.3.4 Scheffe's Test of Writing Comprehension with Respect to Age

The Scheffe's test is conducted to see what age group differed significantly in comprehension skills

Table 4.30 Scheffe's Test of Writing Comprehension with Respect to Age

Alpha=0.050 Error Term=S(AB) DF=601 MSE=5.393128 Critical Value=2.45386

(I) age	(J) age	Mean Difference (I-J)	Std. Error	Sig .	95% Confidence Interval	
					Lower Bound	Upper Bound
9	10	.4845	.2989	.27	-.251	1.220
	11	2.5121	.3685	.00	1.606	3.419
10	9	-.4845	.2989	.27	-1.220	.251
	11	2.0276	.3419	.00	1.187	2.869
11	9	-2.5121	.3685	.00	-3.419	-1.606
	10	-2.0276	.3419	.00	-2.869	-1.187

In the multiple comparison test of Scheffe's in all the sub skills of writing it is found that 9 yrs differed significantly from 10 yrs and 11 yrs of 4th and 5th classes. 10yr olds differed significantly from 9 yrs and 11 yrs of 4th and 5th classes. 11 yr olds differed significantly from the 9 and 10 yr olds. The mean score of age groups indicated that 9yr olds improved more than 10 yr old and 10 yr olds improved better than 11 yr old.

The findings show that the null hypothesis that **“there is no significant difference in the scores of writing skills among the different age group is rejected”**. This shows that age group differed in their response to interventions.

4.5.4 ANCOVA of the Writing Skills with Reference to Locality

The analysis of covariance (ANCOVA) of the writing skills is presented in the table below with reference to its interaction with locality of schools namely urban and rural areas.

Table 4.31 ANCOVA for Writing Skills with Respect to Localities

Skills	Tests	No	Source of variance	df	SSy.x	MSSy.x	F Value	Sig. ** 1% * 5%
Fine Motor Skills FMS	BI	304	Covariate-FMS- Pretest	1	1105.012	1105.012	197.05	**
	AI	304	Between Localities	1	0.511	0.511	0.091	NS
Hand Writing Skills HWS	BI	304	Covariate-HWS- Pretest	1	2138.473	2138.473	276.4	**
	AI	304	Between Localities	1	20.087	20.087	2.849	NS
Spelling Skills SS	BI	304	Covariate-SS- Pretest	1	4242.000	4242.000	1,000.80	**
	AI	304	Between Localities	1	48.571	48.571	11.712	**
Written Expression (WES) Sec-1 Grammar	BI	304	Covariate-WES- I-Pretest	1	2582.000	2582.000	1,068	**
	AI	304	Between Localities	1	19.198	19.198	8.157	**
WES-Section II Writing Compre- hension	BI	304	Covariate-WES- II-Pretest	1	2684.800	2684.800	476.7	**
	AI	304	Between Localities	1	10.484	10.484	1.872	NS
Behaviour manifestation Skills(BMS)	BI	304	Covariate-BMS- Pretest	1	2697.200	2697.200	226.3	**
	AI	304	Between Localities	1	502.823	502.823	45.369	**

The table above clearly indicated that there is significant improvement in both rural and urban after the interventions. The table indicates that there is significant difference at 1% significance in the performance of 4th & 5th class children based on the locality with significant 'F' values for Fine Motor Skills 197.05, Hand Writing Skills 276.4, Spelling Skills 1,000.80, Written Expression Skills with grammar and Writing Comprehension showed significant improvement with F values 1,068 & 476.7, behaviour manifestation skills showed improvement with an F value of 226.3.

To find out which locality differed significantly ANCOVA is used as given below.

4.5.4.1 ANCOVA of Fine Motor Skills with Respect to Locality

The table below presents the ANCOVA data for fine motor skills.

Table 4.32 ANCOVA of Fine Motor Skills with Respect to Locality

Source of variation	Sum of Squares	df	MSSy.x	F	Sig.	
Covariate-Fine Motor Skills Pre -Total	3299.406	1	3299.406	258.249	.000	S
Between Class	20.820	1	20.820	1.630	.203	NS
Between Locality	80.802	1	80.802	6.324	.012	S
Interaction-Class vs Locality	138.804	1	138.804	10.864	.001	s
Error	3820.047	299	12.776			
Total	299533.000	303				

There is significant difference in the mean scores of children from pretest to posttest scores as shown by 258.2 F value of Fine Motor Skills. The rural and urban type locality also differed significantly with 0.12 F value showing significant difference in mean scores. The interaction between class and Locality also differed significantly at 1% significance where the mean scores of 4th and 5th classes of urban schools differed significantly from the 4th and 5th class children of rural schools.

4.5.4.2 ANCOVA of Comprehension Skills with Respect to Locality

The table below presents the data about Written Expression (Comprehension) skills in interaction with the locality of children.

Table 4.33 ANCOVA of Comprehension Skills with Respect to Locality

Source of variation	SSy.x	df	MSSy.x	F	Sig.	
Covariate-Comprehension Pre -Total	1202.312	1	1202.312	1069.596	.000	s
Between Class	1.086	1	1.086	.966	.326	ns
Between Locality	5.194	1	5.194	4.620	.032	s
Interaction-Class vs Locality	4.943	1	4.943	4.397	.037	s
Error	336.100	299	1.124			
Total	14483.000	303				

There is significant difference in the mean scores between rural (11.44) and urban (12.35) children class wise, in Fine Motor Skills where the mean score of rural is (28.55) and urban (32.73) and comprehension skills of rural is (5.75) urban (7.13) there by it is concluded that the urban children fared better in 4th and 5th classes, in Fine Motor Skills and in Writing Comprehension skills than in rural places. So the hypothesis that **“there is no significant difference based on locality”** is rejected. Children from urban schools fared slightly better in the posttest s even though both children from both rural and urban schools showed significant improvement after intervention.

4.5.5 The Analysis of Co-Variance of the Writing Skills with Respect to Family Income

The family income was calculated as high income, middle income and low income. Based on these criteria the analysis of the data is presented below.

Table 4.34 ANOVA for Writing Skills with Respect to Family Income

Skills	Tests	No	Source of variance	df	SSy.x	MSSy.x	F Value	Sig. ** 1% * 5%
Fine Motor Skills FMS	BI	304	Covariate-FMS-Pretest	1	1105.012	1105.012	197.05	**
	AI	304	Among high, Middle Low Income grps	2	1.857	0.929	0.166	NS
Hand Writing Skills HWS	BI	304	Covariate-HWS-Pretest	1	2138.473	2138.473	276.4	**
	AI	304	Among high, Middle Low Income grps	2	4.345	2.172	0.281	NS
Spelling Skills SS	BI	304	Covariate-SS-Pretest	1	4242.000	4242.000	1,000.80	**
	AI	304	Among high, Middle Low Income grps	2	9.559	4.780	1.126	NS
WES (Grammar)	BI	304	Covariate-WES-I-Pretest	1	2582.000	2582.000	1,068	**
	AI	304	Among high, Middle Low Income grps	2	4.491	2.246	0.933	NS
WES (Compre-hension)	BI	304	Covariate-WES-II-Pretest	1	2684.800	2684.800	476.7	**
	AI	304	Among high, Middle Low Income grps	2	4.214	2.107	0.374	NS
Behaviour Manifestation Skills (BMS)	BI	304	Covariate-BMS-Pretest	1	2697.200	2697.200	226.3	**
	AI	304	Among high, Middle Low Income grps	2	1.812	0.906	0.076	NS

The table above clearly indicated that there is significant improvement in all the three groups in the family income namely high, middle and low income groups after the interventions. The table indicates that there is significant difference at 1% significance in the performance of 4th & 5th class children from all the income groups with significant 'F' values for Fine Motor Skills 197.05, Hand Writing Skills 276.4, Spelling Skills 1,000.80, Written Expression Skills with grammar and Writing Comprehension showed significant improvement with F values 1,068 & 476.7, behaviour manifestation skills showed improvement with an F value of 226.3. So the hypothesis that there is no significant difference based on Family income after intervention" is rejected. Children from all income groups showed great improvement in the sub skills of writing after intervention.

The findings of the study reiterated the efficacy of intervention strategies in tackling writing difficulties in children of 4th and 5th classes. There is significant improvement in children in both the classes after intervention.

The next chapter gives a detailed summary and conclusion based on the findings of the analysis chapter.