Synthetic phonics in low-income schools in Hyderabad, India

(Suggested shorter title: Phonics in India)

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Abstract

This paper considers the findings from a research project carried out in schools in low-income areas of Hyderabad, India during 2004-2005. Over 500 children in 22 schools took part in the experiment which lasted 6 months. Just over half of the children experienced lessons organised around the Jolly Phonics synthetic phonics programme. Lessons were carried out for 1 hour every school day in 14 of the 22 schools; the remainder proceeded with their own methods of teaching English. The findings show that there was a statistical significant improvement between the children in the learning and control groups for 5 of the 6 tests given.

Introduction

For school children in Hyderabad, language forms a large part of the curriculum. In India, 17 official languages are recognised by the United Nations with more than 700 dialects. Hindi is the national language and English is the common 'bridging' language used everywhere in India (Mitra et al, 2003). Children in Hyderabad are required in school to learn their state language – Telugu; the national language – Hindi; and if a Muslim, their mother tongue, Urdu.

Private unaided schools are found in the slums of Hyderabad, as in other Indian cities and developing countries around the world (Tooley, 2004; Nambissan, 2003; Rose, 2002; Alderman et al, 2001; Watkins, 2000; Aggarwal, 2000). One of the reasons for this 'mushrooming', at least in the Indian context is because private schools, ostensibly at least, offer education through English medium, whereas in Government schools English is usually only taught as a subject from Class 5 (Tooley and Dixon, 2003). Poor parents believe that the ability to communicate in English will provide their children with opportunities related to employment and education, to raise them out of the poverty in which they currently live (Mitra, et al, 2003; Sen, R. and Blatchford, P, 2001).

Private schools typically run from Nursery standard (for children aged around 3 yrs) to Class 10 standard (for children aged around 15-16 yrs). The private schools in which the research was carried out are located in notified "slum" areas, according to the latest census available or municipal documents (Singh, 1997; MCH, 1998). Our research has shown that these private schools charge on average between Rs. 83/- (£1.04) and Rs. 176/- (£2.20) per month, the fee being dependent upon the class in which the child is studying. These school fees account for approximately 3-6% of the family income per month (Tooley and Dixon, 2005). Parents are often illiterate in their mother tongue and cannot speak or communicate in English.

From research carried out earlier in the city of Hyderabad it was discovered that a major area considered by the school owners where improvements and assistance could be beneficial was the method of teaching English (Tooley and Dixon, 2003). Because of the importance provided to English by the parents and the desire by the school owners to implement an improved method of teaching English it was decided to carry out research in order to consider the effectiveness of teaching children attending private slum schools to learn to read and write English using a synthetic phonics package. Currently the method used to teach children English - reading, writing and pronunciation - is typically rote learning, where the children memorise whole words by sight. The children are unable to decode or blend implicitly using a whole word recognition strategy. Building up vocabulary, using visual shapes, has been suggested to have limitations when children are faced with too many words and too many similar words (Macmillan, 1997; Gough et al, 1992 and Ehri, 1991). Typically in the schools of Hyderabad children are taught English by first learning the letters of the alphabet – that is, names not sounds, followed by learning whole words such as those used for colours, fruits and parts of the body and then rote learning techniques are used to learn whole sentences, children usually coming up to the board and pointing with a stick to the words, these being chanted by the whole class in unison as each word is struck by the child at the board.

An alternative route was to experiment with the use of synthetic phonics. Synthetic phonics is a method by which children learn letter sounds in a specified order which can then be blended together to form words (Feitelson, 1988). The children are able to sound out each letter and synthesise these sounds together in order to pronounce the words for themselves without the assistance of the teacher (Johnston, R. and Watson, J., 2005). We chose the commercial package offered by Jolly Learning Ltd, 'Jolly Phonics' (Lloyd, 1992). The package used in the learning group classrooms included worksheet for the children taken from 'The Phonics Handbooks' (Lloyd, 1992) to practice writing the letters; 'flash cards' – cards with printed letters on them shown to the children to sound out as a class activity; 'blending cards' – used in lessons once the children had learnt the sounds in order that the children could sound out

the letters and start to read words by decoding; 'Big Book 1-7' (Lloyd and Wernham, 1992) – books consisting of stories in order for the children to learn the sound/letter for that day using the story as a mnemonic for the letter sound; and 'Red Readers' (Wernham, 2001) – reading books for the children to practice their decoding skills using sounds and letters taught thus far.

Utilising the Jolly Phonics materials, once the initial 42 sounds are taught (at a rate of 1 per day) children are introduced to carefully constructed reading books, utilising words constructed from letters that the children can synthesise and blend in order for them to read the text. The children are able to read unfamiliar words, unlike when being taught through analytic phonics where letter sounds are taught after reading has begun and words are identified using context rather than blending and decoding (Johnston and Watson, 2005). It has been argued that by teaching children through synthetic phonics, children are able to read words, using their decoding and synthesising skills without understanding the meaning of the words. However, vocabulary and comprehension are skills, it is countered, can be nurtured once the ability to read has been established (House of Commons, Education and Skills Committee, 2005, p.13).

Method

The research was conducted in 22 private unaided English medium schools sited in notified slum areas of the city of Hyderabad. 265 children from 14 schools comprised the learning group and 241 children from 8 schools comprised the control group. The learning group experienced a 1 hour long phonics class designed around Jolly Phonics' materials every week day for 6 months, taught by a peripatetic teacher trained by the researchers in the methods of the Jolly Phonics programme. The control group continued teaching English using the method of the schools choosing, in general, through rote learning of texts, implicitly involving whole word recognition. Children from class 1 were chosen to participate. Schools were invited by letter to attend a seminar, where the concept of the research was explained. Having agreed to take part the schools were then randomly selected to participate in the learning or control

groups. All of the Class 1 students were to participate in the research. However, where the class was large in the learning group 30 children were selected at random from the class list to experience the Jolly Phonics lessons. The average age in both the learning and control groups was 7 years. Just over one fifth of the children did not know their ages, as is typical in slum areas in India, and therefore they were given the mean age for their class.

The children were assessed at the beginning of the programme prior to the introduction of the phonics lessons and then six months later at the end of the programme using the same tests. Tests used were to analyse the improvement in reading, spelling, letter recognition, dictation and sound values of letters. The tests were the Burt reading test, Schonell spelling test, three tests constructed using the Nfer Nelson Diagnostic Reading Programme - Stage 1 (Ames, 1980) and a dictation test, where the pupils had to spell every word in a sentence correctly in order to gain a mark. It should be noted that Indian norms for the Burt and Schonell tests are not available and therefore reading ages cannot be taken as being above or below Indian means. The three Nfer Nelson tests were: first a letter matching test consisting of 10 questions where letters on the left of the page have to be matched with letters on the same row (nfera). Secondly, a test concerning sound values of letters consisting of 12 words containing 36 letter sounds (nferb). Finally, a test looking at the ability to blend sounds in order to pronounce words, mainly consisting of 3 letters, the total number of words in the test being 34 words (nferc) (see Appendix).

Schools were selected so that the control and learning group schools were all operating in similar slum areas, charging similar fees, and catering for apparently similar children from similar backgrounds. Analysis of the attainment data from the tests administered prior to the start of the teaching indicates that unfortunately there is no evidence to support the hypothesis that the samples are statistically matched. This removed the possibility of analysing the results using unadjusted results from the tests at the end of the teaching period, as we can not assume all improvements are from the same starting point. Instead we have based most of the

analysis upon improvements in test scores over the six month period. In order to test that any improvements made by students in the learning group are different from the control group the Mann-Whitney U test was used.

A frequent criticism of research of this type is that the results could be conditioned by the effort being expended on assisting the learning group exceeding that relating to the control group. However, that is not the case in this project, the teachers in the control group knew that their pupils attainment was going to be tested and it was felt that they were trying to teach as well as they were able; this is evidenced within the results as discussed below.

Results

At the start of the project, the average pupil in the learning group is 0.36 years older (roughly 4 months), have slightly higher reading and spelling ages (differences of 1 month and 1.7 months respectively) than the learning group (see table 1 below). Although these differences are *statistical differences* they are of little importance in terms of children's' actual reading and spelling ability. If these children are compared to the Burt norms their reading ages were roughly two years below their actual ages. Pre-project differences in the percentage marks on the dictation test were only 1.6 percentage points. The absolute percentage point differences between the two groups for the nfera and nferc tests are 2 percentage points and 6 percentage points, in favour of the learning group. All children received a zero mark on the nferb test. This test asks the children to provide the 'sound' of a letter, therefore providing the 'sound' rather than the letter 'name'. Children typically in these private unaided schools would have learnt their English alphabet during Nursery classes using letter names, initially all of the children provided letter names rather than letter 'sound' they were asked to provide.

In order to compare changes in the pre- and post-projects test scores, the absolute improvement in the percentage mark of the test scores have been used for each pupil for the dictation, nfera, nferb and nferc tests and the absolute improvement in reading age (calculated

from the Burt test) and spelling age (calculated from the Schonell test). Due to differences in class sizes, class means were calculated and used in all of the statistical tests. All school names have been anonymised and a school code provided to each school.

[table 1 should be inserted about here]

Reading – Burt Reading test

Over the six month test period the mean pupil in the average class of the learning group improved his reading age by 1.1 years, the corresponding figure for the control group was 0.7 years (table 2). This result is highly statistically significant when tested with the Mann-Whitney U test (the two tailed p-value is 0.000). In both groups there has been convergence between the child's actual age and their reading age. This suggests that under the right conditions this set of schools can deliver good quality reading education and put their pupils on a path converging to the Burt norm standards, however the phonics method is superior to the results possible using methods currently at the local schools disposal. We are obviously unable to comment upon the ability of this phonics methods to sustain this improvement in reading ability over time.

Figure 1 shows the class mean improvement in reading years for all of the learning and control group schools. No control group schools improved their class mean scores by a year or more. In nine of the fourteen learning group schools there was a class mean improvement of a year or more.

[insert figure 1 about here]

Spelling – Schonell spelling test

The pre-experiment average spelling age was 5.5 years[1]. The mean pupil in the average class of the learning group improved by 1.2 years corresponding figure for the control group was 0.7 years (table 2). Again this result is highly statistically significant when tested with the Mann-Whitney U test (p=0.000). As with the reading test results, in both groups there has been convergence between the child's actual age and their normed spelling age, and again the learning group improvement has been almost double the control group. This result suggests that the phonics method is not only successful on its main focus of reading, but is also a successful method at teaching basic spelling.

Figure 2 shows that in two of the fourteen learning group schools there was a class mean improvement in spelling less than one year, only one school of the eight control groups school classes achieved a class mean improvement of one year.

[insert figure 2 about here]

Dictation – 20 sentences

The pre-experiment average dictation score was 3.8% for the control group and 5.4% for the learning group. The mean pupil in the average class of the learning group improved by 28%, the corresponding figure for the control group was 10%. This result is highly statistically significant when tested with the Mann-Whitney U test (two tailed p-value is 0.000). Figure 3 illustrates the mean class improvement for each control group and learning group school.

[insert figure 3 about here]

[1] Although we know the control and learning groups pre-experiment test results are statistically different the percentage differences for the reading tests, spelling test, and nfera results are small, therefore they are treated as identical here.

Nfer test a: letter matching

Initially the average letter matching score was 26% for the learning group and 24% for the control group. The mean pupil in the average class of the learning group improved by 27% and in the control group by 23%. However this result is not statistically significant when tested with the Mann-Whitney U test, the two tailed p-value being 0.145. This letter matching test illustrates the ability of the child to recognised letters. The fact that this result was not statistically significant illustrates that the method of teaching the children to recognise and form letters in the phonics course is of similar efficiency to the method used in the control group. Being able to recognise the letter 'a' for example is not dependent upon the sound value or name that is attributed to it.

[figure 4 to be inserted about here]

Nfer test b: sound values

This test considered the ability of the children to provide the sound of a letter and therefore it is not surprising that the average child in the average class of the learning group improved by 98% and those in the control group by 0%. Initially no child could provide the letter sound but gave the letter name. After participating in phonics lessons almost all of the children in the learning group could provide the sound of the letters in this test. The result is highly statistically significant. The p-value in the Mann-Whitney U test is 0.000. This test indicates that the majority of children participating in the phonics class have learnt the basic building blocks, the 42 sounds, of the phonics method by the end of the six month period (figure 5).

[figure 5 to be inserted about here]

Nfer test c: blending

The test consisted of 2 and 3 letter words that could be read either by blending the letters or by word recognition. The pre-experiment average 'test c' score was 24% for the control group

and 30% for the learning group. The mean pupil in the average class of the learning group improved by 57% compared to the mean pupil in the average class of the control group improving by 34%. The result is statistically significant when tested with the Mann-Whitney U test, the two tailed p-value being 0.000.

[figure 6 to be inserted about here]

[table 2 to be inserted about here]

Conclusions

This paper considers the findings from a research project carried out in private schools in slum areas of Hyderabad, India during 2004-2005. Over 500 children in 22 schools took part in the experiment which lasted 6 months. Just over half of the children experienced lessons organised around the Jolly Phonics synthetic phonics programme. The findings show that the improvements in the test scores of students experiencing the phonic method were statistically higher than those in the control group when assessing reading, spelling, dictation, and the ability to sound out letters and words for 5 of the 6 tests given. The results are interesting because they have shown that children living in a slum environment, many with illiterate parents even in their mother tongue, are able to decode and blend English words successfully. The criticism that the children' comprehension of text may be limited needs to be further tested, however the research was carried out in a short time period (six months) and as suggested the building blocks seem to have been set and further instruction could now be carried out to nurture understanding of text.

Results show that with appropriate incentives/monitoring local teaching can yield some good results in a relatively short period (in this case monitoring by an international research team), however phonics can yield much larger improvements, with mean reading and spelling ages rising by approximately 12 and 13 months respectively in the six month project period.

Additionally the programme would lead to positive externalities across other subject areas. Many of the private unaided schools in Hyderabad teach all subjects in English so if pupils are struggling less with English they will be better equipped to tackle new material relating to other subject when delivered using the English language.

Appendix - Test examples

Nfer-Nelson Test A Letter matching:

1	**a**	b	a	o	e	a	d	o	a
2	**s**	n	e	s	a	o	s	t	s
3	**on**	no	on	oh	ho	an	na	ha	ra
4	**da**	ab	ob	ba	da	da	ad	ab	da
5	**wau**	uam	wau	man	wan	wua	uwa	mau	
6	**dpb**	bpd	dpd	bpd	dpb	bpb	dqb	dpb	
7	**chaf**	cuaf	cuat	fano	canf	chfa	chaf		
8	**dogl**	bopl	dogl	bogl	dagr	dogl	dagl		
9	**swzc**	szwc	czsw	swzc	scwz	czws			
10	**laos**	soal	loos	laso	loas	laas	laos		

Nfer-Nelson Test B Sound value of letters:

m	u	d	l	o	g	j	o	b	v	e	t
d	i	g	r	o	d	c	o	t	p	a	L
h	o	p	w	a	g	k	i	t	y	e	s

Nfer-Nelson Test C Blending 2/3 letter words:

in	at	up	on	an
dim	van	god	ham	sip
jet	nip	mop	led	dab
pen	cup	lit	ban	mix
pan	nap	fix	bud	sum
got	hid	ram	fit	tub
jug	tax	rug	web	

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Table 1: Analysis of data before teaching started

	Learning or control group	Pupils' prox Ages	Valid N	Percentage score: dictation	Reading Age	Spelling Age	pnfera1	pnferb1	Pnferc1
School code		Mean		Mean	Mean	Mean	Mean	Mean	Mean
CL1	Learning	6.83	18	.01	5.4	5.4	.19	.00	.15
CC1	Control	7.50	34	.05	5.6	5.5	.27	.00	.24
DL2	Learning	8.33	23	.07	5.9	5.6	.23	.00	.32
FC2	Control	6.25	19	.05	5.9	5.7	.19	.00	.34
FBL3	Learning	7.59	23	.04	5.6	5.5	.24	.00	.28
ISL4	Learning	7.46	23	.08	6.1	6.0	.27	.00	.49
IEL5	Learning	8.17	15	.04	5.6	5.5	.29	.00	.32
JC3	Control	6.72	39	.01	5.4	5.3	.18	.00	.14
LL6	Learning	6.38	17	.05	5.5	5.4	.25	.00	.15
MAIC4	Control	6.63	35	.01	5.8	5.4	.24	.00	.23
MC5	Control	7.60	34	.01	5.8	5.5	.28	.00	.26
MMC6	Control	7.59	11	.04	6.0	5.8	.25	.00	.43
MQL7	Learning	7.30	20	.02	5.3	5.2	.18	.00	.09
NRL8	Learning	6.70	20	.06	6.0	5.6	.27	.00	.33
PL9	Learning	6.83	12	.14	6.2	6.1	.31	.00	.50
RL10	Learning	8.78	18	.09	6.2	6.0	.33	.00	.55
SL11	Learning	9.05	20	.01	5.7	5.5	.36	.00	.25
SCL12	Learning	7.56	18	.03	5.8	5.5	.22	.00	.27
SEl13	Learning	7.03	19	.08	5.7	5.6	.27	.00	.26
SPC7	Control	6.95	36	.07	5.6	5.4	.21	.00	.22
SDC8	Control	6.96	33	.09	5.7	5.4	.26	.00	.27
SUL14	Learning	6.13	19	.08	5.7	5.5	.23	.00	.33
Control		7.11	241	0.038	5.67	5.45	0.24	.00	0.24
Learning		7.47	265	0.054	5.75	5.59	0.26	.00	0.30
Absolute difference of learning from control group		0.36		0.016	0.08	0.14	0.02	0	0.06
percentage difference of learning from control group		5%		42%	1%	3%	8%	0%	25%
Mann Whitney U test two-tailed		0.010		0.027	0.077	0.010	0.038	1.000	0.003
Sample averages		7.35		.05	5.7	5.52	.25	.00	0.27

Figure 1Class mean improvement in reading years

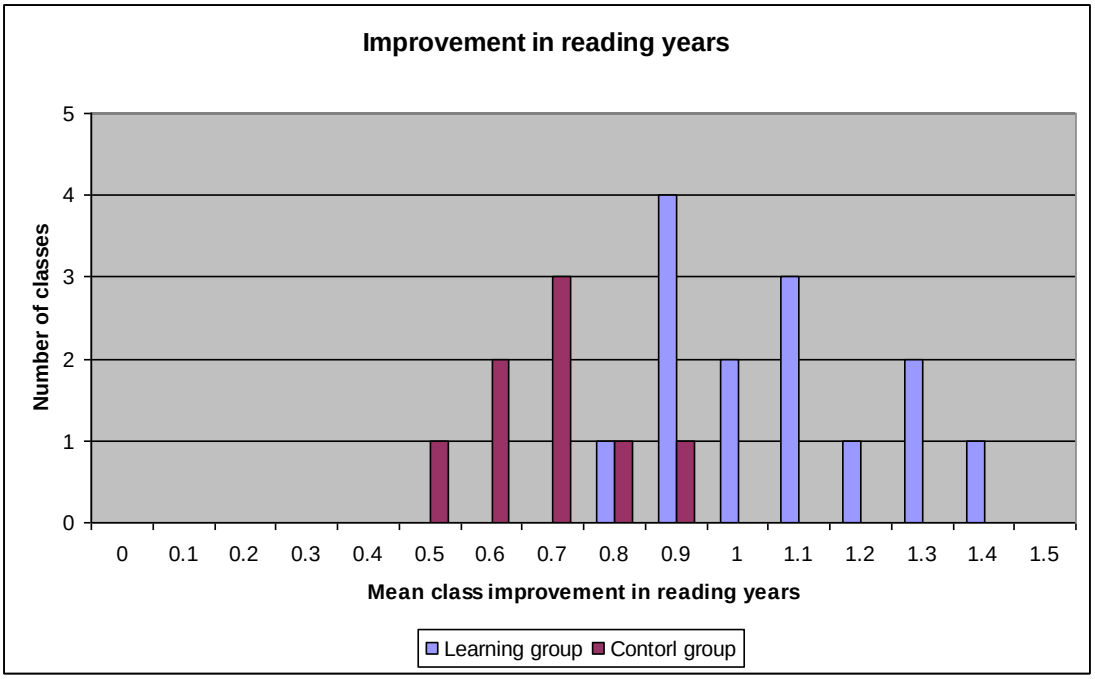

Figure 2 Class mean improvement in spelling years

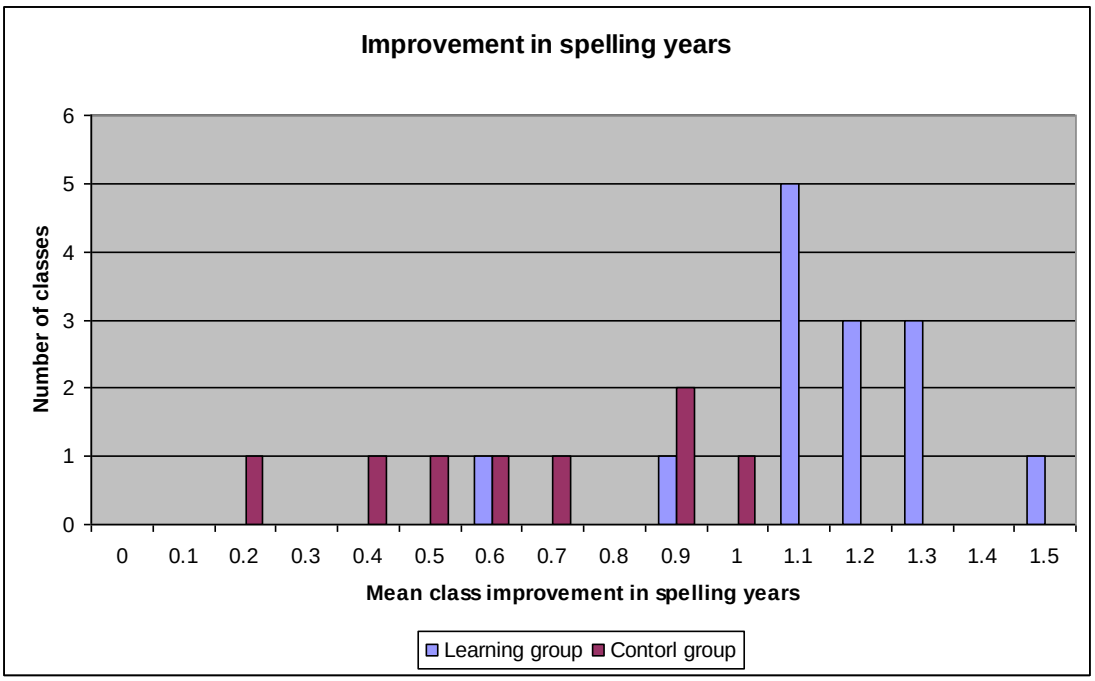

Figure 3 Class mean improvement in dictation

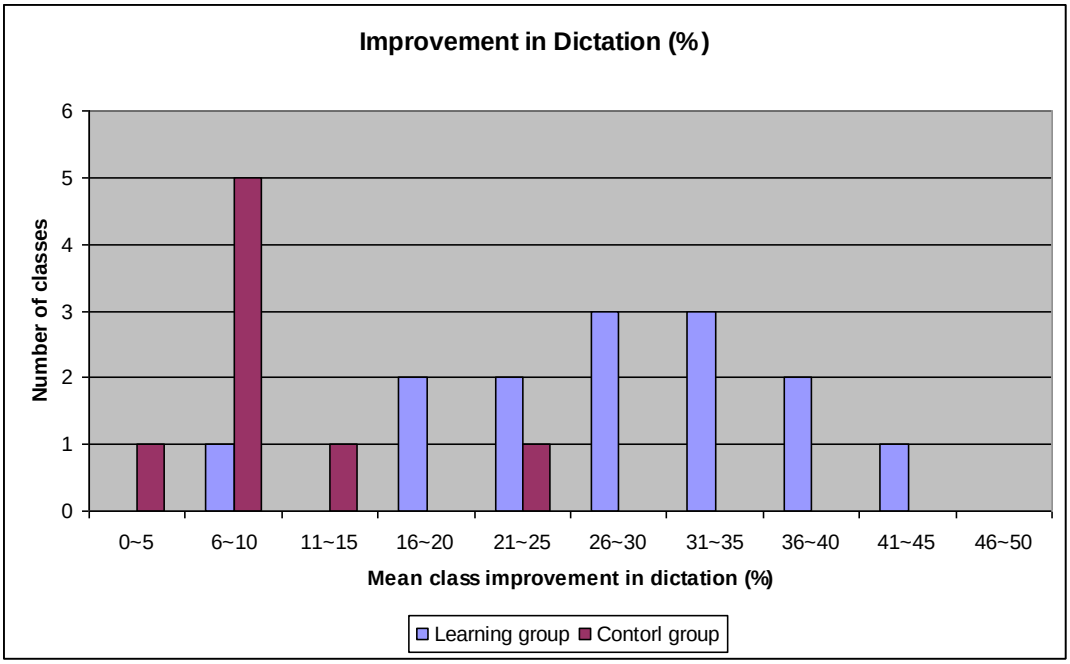

Figure 4 Class mean improvement in letter matching test

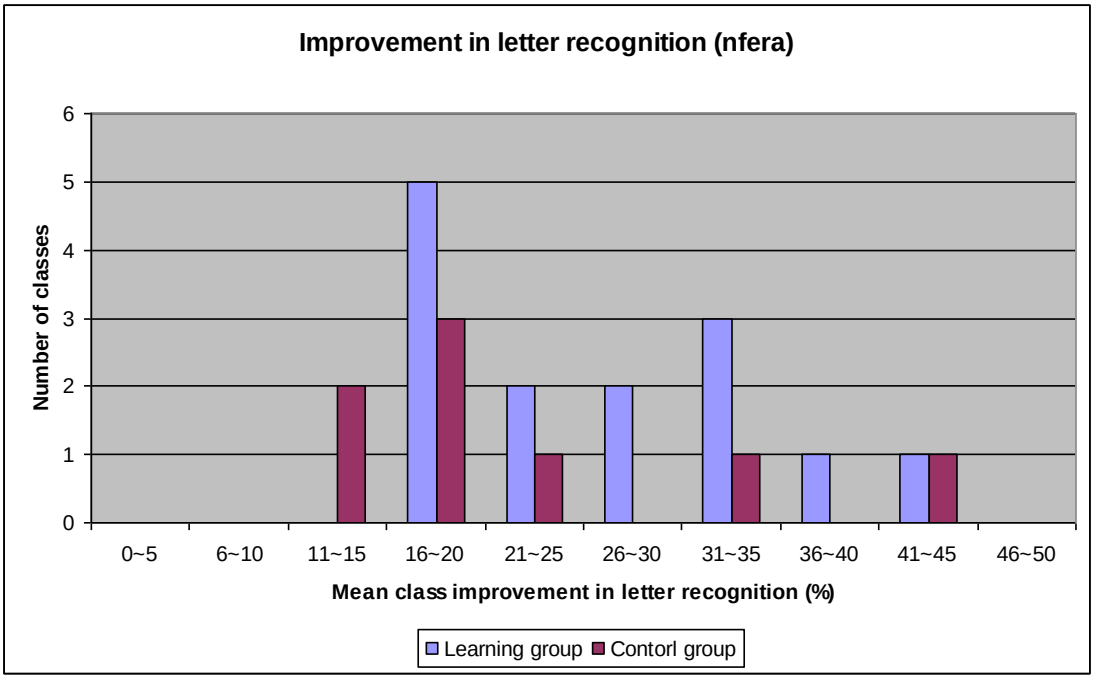

Figure 5 Class mean improvement in sound value test

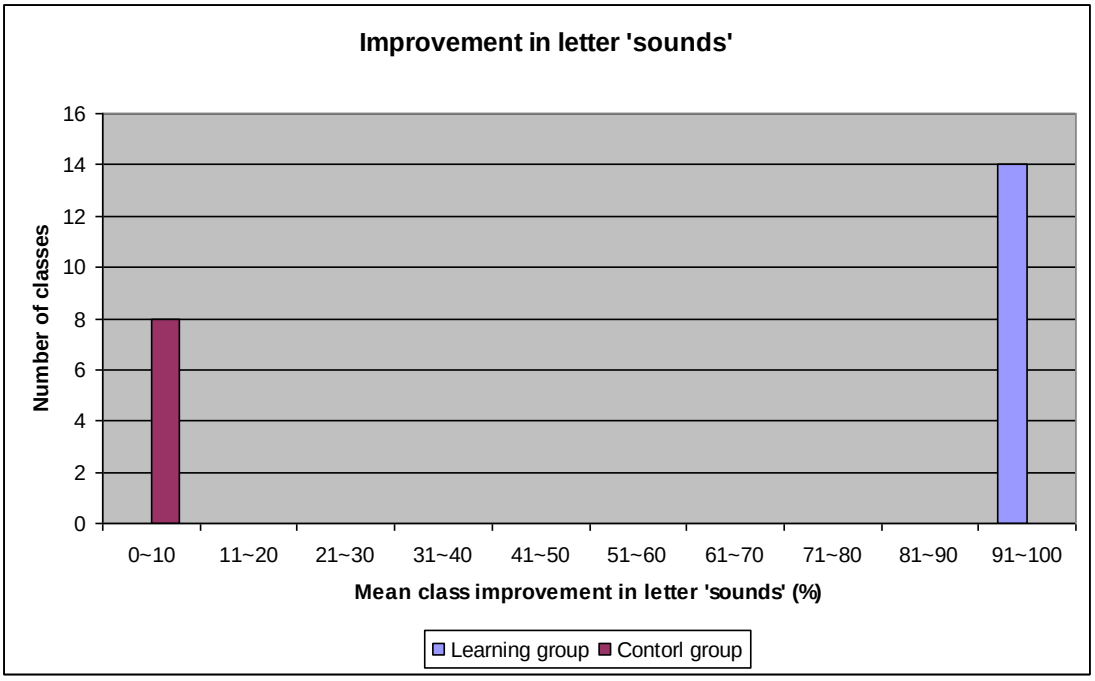

Figure 6 Class mean improvement in blending test

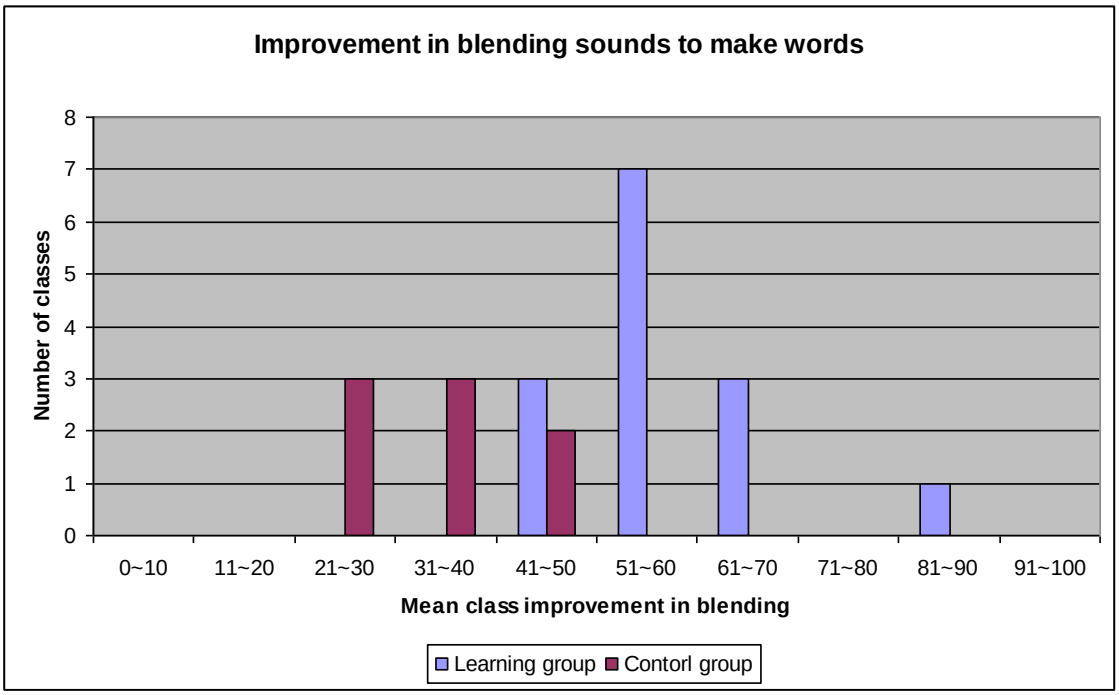

Table 2 Complete set of results for each school – class mean improvements in all tests

School	Teacher	Learning/ control group	Improvement in spelling yrs	Rank	Improvement in reading yrs	Rank	Dictation improve.	Rank	Nfera	Rank	Nferb	rank	Nferc	rank
CL1	**L**	**1**	**1.5**	**22**	**1.3**	**20**	**0.223529**	**11**	**0.205556**	**11**	**0.993827**	**17**	**0.655229**	**21**
CC1	L	0	0.5	3	0.7	6	0.056	2	0.170588	4	0	1	0.343426	5
DL2	**S**	**1**	**1.2**	**17**	**0.8**	**7**	**0.180435**	**9**	**0.226087**	**13**	**0.977053**	**13**	**0.533248**	**13**
FC2	S	0	0.9	9	0.6	3	0.246875	13	0.326316	17	0	2	0.320433	4
FBL3	**L**	**1**	**1.3**	**20**	**1.2**	**19**	**0.454348**	**22**	**0.182609**	**7**	**0.950483**	**9**	**0.567775**	**15**
ISL4	**S**	**1**	**1.3**	**21**	**0.9**	**11**	**0.302273**	**17**	**0.191304**	**8**	**1**	**20**	**0.466752**	**10**
IEL5	**F**	**1**	**1.1**	**15**	**1.3**	**21**	**0.276667**	**15**	**0.353333**	**19**	**0.994444**	**18**	**0.598039**	**19**
JC3	F	0	0.7	6	0.7	4	0.061667	3	0.192308	10	0	3	0.278281	2
LL6	**L**	**1**	**0.6**	**4**	**1.0**	**15**	**0.094118**	**6**	**0.317647**	**16**	**0.968954**	**11**	**0.591696**	**18**
MAIC4	S	0	0.6	5	0.7	5	0.087037	4	0.151429	2	0	4	0.423529	7
MC5	S	0	0.4	2	0.6	2	0.110714	8	0.223529	12	0	5	0.294118	3
MMC6	S	0	0.2	1	0.5	1	0.090909	5	0.445455	21	0	6	0.23262	1
MQL7	**L**	**1**	**1.2**	**16**	**1.4**	**22**	**0.3325**	**19**	**0.29**	**15**	**0.991667**	**16**	**0.855882**	**22**
NRL8	**L**	**1**	**1.1**	**12**	**0.9**	**9**	**0.2875**	**16**	**0.335**	**18**	**0.995833**	**19**	**0.538235**	**14**
PL9	**L**	**1**	**1.1**	**11**	**0.9**	**12**	**0.325**	**18**	**0.191667**	**9**	**1**	**21**	**0.42402**	**8**
RL10	**S**	**1**	**1.3**	**19**	**0.9**	**10**	**0.383333**	**21**	**0.177778**	**6**	**1**	**22**	**0.428105**	**9**
SL11	**F**	**1**	**0.9**	**8**	**1.0**	**14**	**0.185**	**10**	**0.275**	**14**	**0.952778**	**10**	**0.630882**	**20**
SCL12	**F**	**1**	**1.1**	**13**	**1.1**	**16**	**0.252778**	**14**	**0.488889**	**22**	**0.983025**	**14**	**0.568627**	**16**
SEL13	**L**	**1**	**1.1**	**14**	**1.1**	**18**	**0.373684**	**20**	**0.173684**	**5**	**0.976608**	**12**	**0.509288**	**12**
SPC7	L	0	1.0	10	0.9	13	0.094444	7	0.138889	1	0	7	0.473039	11
SDC8	L	0	0.9	7	0.8	8	0.028261	1	0.169697	3	0	8	0.37344	6
SUL14	**P**	**1**	**1.2**	**18**	**1.1**	**17**	**0.228125**	**12**	**0.363158**	**20**	**0.98538**	**15**	**0.583591**	**17**
		Sample average	1.0	11.5	0.9	11.5	0.21	11.5	0.25	11.5	0.63	11.5	0.49	11.5
		Learning group average	1.2	15.0	1.1	15.1	0.28	15.0	0.27	13.1	0.98	15.5	0.57	15.3
		Control group average	0.7	5.4	0.7	5.3	0.10	5.4	0.23	8.8	0.00	4.5	0.34	4.9
			ISPELL	RSPELL	IREADING	RREAD	IDIC	RDIC	INFERA	RNFERA	INFERB	RNFERB	INFERC	RNFERC

Mann-Whitney U	7.000	7.000	6.000	6.000	7.000	7.000	34.000	34.000	.000	.000	3.000	3.000
Z	-3.344	-3.344	-3.414	-3.413	-3.344	-3.344	-1.502	-1.502	-3.921	-3.822	-3.617	-3.617
Asymp. Sig. (2-tailed)	.001	.001	.001	.001	.001	.001	.133	.133	.000	.000	.000	.000
Exact Sig. [2*(1-tailed Sig.)]	.000	.000	.000	.000	.000	.000	.145	.145	.000	.000	.000	.000
Exact Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.145	.145	.000	.000	.000	.000
Exact Sig. (1-tailed)	.000	.000	.000	.000	.000	.000	.073	.073	.000	.000	.000	.000

a Not corrected for ties.b Grouping Variable: GROUP

(Percentage improvements shown as percentages rather than decimals also learning and control schools grouped together)

School	Learning/ control group	Improvement in spelling yrs	Rank	Improvement in reading yrs	Rank	Dictation improve.	Rank	Nfera	Rank	Nferb	rank	Nferc	rank
CL1	**1**	**1.5**	**22**	**1.3**	**20**	**22%**	**11**	**21%**	**11**	**99%**	**17**	**66%**	**21**
DL2	**1**	**1.2**	**17**	**0.8**	**7**	**18%**	**9**	**23%**	**13**	**98%**	**13**	**53%**	**13**
FBL3	**1**	**1.3**	**20**	**1.2**	**19**	**45%**	**22**	**18%**	**7**	**95%**	**9**	**57%**	**15**
ISL4	**1**	**1.3**	**21**	**0.9**	**11**	**30%**	**17**	**19%**	**8**	**100%**	**20**	**47%**	**10**
IEL5	**1**	**1.1**	**15**	**1.3**	**21**	**28%**	**15**	**35%**	**19**	**99%**	**18**	**60%**	**19**
LL6	**1**	**0.6**	**4**	**1**	**15**	**9%**	**6**	**32%**	**16**	**97%**	**11**	**59%**	**18**
MQL7	**1**	**1.2**	**16**	**1.4**	**22**	**33%**	**19**	**29%**	**15**	**99%**	**16**	**86%**	**22**
NRL8	**1**	**1.1**	**12**	**0.9**	**9**	**29%**	**16**	**34%**	**18**	**100%**	**19**	**54%**	**14**
PL9	**1**	**1.1**	**11**	**0.9**	**12**	**33%**	**18**	**19%**	**9**	**100%**	**21**	**42%**	**8**
RL10	**1**	**1.3**	**19**	**0.9**	**10**	**38%**	**21**	**18%**	**6**	**100%**	**22**	**43%**	**9**
SL11	**1**	**0.9**	**8**	**1**	**14**	**19%**	**10**	**28%**	**14**	**95%**	**10**	**63%**	**20**
SCL12	**1**	**1.1**	**13**	**1.1**	**16**	**25%**	**14**	**49%**	**22**	**98%**	**14**	**57%**	**16**
SEL13	**1**	**1.1**	**14**	**1.1**	**18**	**37%**	**20**	**17%**	**5**	**98%**	**12**	**51%**	**12**
SUL14	**1**	**1.2**	**18**	**1.1**	**17**	**23%**	**12**	**36%**	**20**	**99%**	**15**	**58%**	**17**
CC1	0	0.5	3	0.7	6	6%	2	17%	4	0%	1	34%	5
FC2	0	0.9	9	0.6	3	25%	13	33%	17	0%	2	32%	4
JC3	0	0.7	6	0.7	4	6%	3	19%	10	0%	3	28%	2
MAIC4	0	0.6	5	0.7	5	9%	4	15%	2	0%	4	42%	7
MC5	0	0.4	2	0.6	2	11%	8	22%	12	0%	5	29%	3
MMC6	0	0.2	1	0.5	1	9%	5	45%	21	0%	6	23%	1
SPC7	0	1	10	0.9	13	9%	7	14%	1	0%	7	47%	11
SDC8	0	0.9	7	0.8	8	3%	1	17%	3	0%	8	37%	6