Scholastic Achievement and Literacy Level of children at Primary Stage

Karnataka, Orissa and Uttar Pradesh

सर्व शिक्षा अभियान
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Contents

EXECUTIVE SUMMARY

The main purpose of this study was to assess scholastic achievement and literacy level of students in the last grade of primary level in language and mathematics. The study however, also had another objective: to check whether the gains after implementation of DPEP for 5 years were sustained in primary schools. For the first objective, in addition to the TAS tests, simple tests of reading and writing in language and doing simple arithmetic sums, were also administered to assess the literacy and numeracy level of the students. For the second objective, students' achievement level was compared with the achievement level of students of the same grade in the same schools two years earlier when Terminal Assessment Survey (TAS) was conducted for DPEP. The same tests that were used in TAS were administered to the students in this study for checking whether the achievement level had remained the same or had improved or declined after a gap of 2 years since the completion of DPEP.

The study was conducted in two districts which had medium achievement in TAS in each of the three states: Orissa, Uttar Pradesh and Karnataka[1]. The districts were Dhenkanal and Kalahandi in Orissa; Bellary and Mysore in Karnataka; and Maharajganj and Moradabad in Uttar Pradesh. Two States (Orissa and Uttar Pradesh) had primary cycle of 5 years whereas Karnataka had primary cycle of 4 years. The same fifty schools in which TAS was administered in these districts were chosen for testing the students. Students studying in the last class of the primary cycle were tested.

Data on school infrastructure, teachers and home background of students was collected using questionnaires for schools, teachers and students. While TAS tests in language and Mathematics were used to assess students' achievement, the tests for measuring literacy and numeracy were developed specifically for this study. The tests had three components: Reading aloud, Writing and Reading Comprehension. Each component was given equal weight age.

The average achievement could be considered as satisfactory in Uttar Pradesh but quite poor in Karnataka and Orissa, the mean scores (average of two districts) and expressed as percentage of maximum marks in language and mathematics respectively, being 60.1 and 54.5 in Uttar Pradesh; 28.8 and 27.1 in Karnataka; and 50.1 and 38.9 in Orissa. Comparison of mean scores in language and mathematics in TAS of 2003 was made with the mean scores of the presented Repeat Assessment Survey (RAS,2005) to see whether there was any significant increase or decrease in achievement level of students after two years since the cessation of DPEP.

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[1] The study was conducted in Maharashtra also but due to certain inconsistencies found in the data the state was excluded from the present report.

In Orissa, there was decrease in the mean score in Mathematics and an increase in mean score in language in both districts between TAS and the present the Repeat Assessment Survey (RAS). In Dhenkenal, the mean score in mathematics declined from 48.3 in TAS to 43.4 in RAS and in language it increased from 41.5 in TAS to 54.3 in RAS. In Kalahandi, the mean score declined from 41.9 in TAS to 33.9 in RAS in mathematics and increased from 40.6 in TAS to 45.3 in RAS in language.

In Uttar Pradesh, in both the districts achievement scores showed decline in both subjects , language and mathematics between TAS and RAS. In Maharajganj, the mean score in mathematics declined from 64.2 in TAS to 51.9 in RAS and in language from 71.9 in TAS to 57.7 in RAS. In Moradabad, the mean score declined from 64.9 in TAS to 57.9 in RAS in mathematics and from 73.9 in TAS to 64.5 in RAS in language.

In Karnataka too, the achievement scores showed considerable decline. In mathematics, the mean score in TAS were 37.5 and 39.1 in Bellary and Mysore respectively which declined to 26.9 and 27.2 respectively in RAS-05. Similarly in language, achievement scores in TAS were 40.6 and 40.3 in Bellary and Mysore respectively which declined to 31.9 and 26.3 respectively in RAS-05.

It is thus noticed that the achievement level assessed by TAS tests in language and mathematics had declined in all the three states after two years of termination of DPEP except in the language test in Orissa, in which it had increased. It is a matter of concern that the gain resulting from DPEP inputs was not sustained after the programme ended.

Achievement in literacy tests indicate that around only one-fourth of the students in Karnataka (27.1%) and Orissa (27.6%) could be deemed as literate. In Uttar Pradesh, the picture was better with more than half (54.2%) of students belonging to this group. Very few students were found to be fully literate i.e. scoring 75% and above. Only 0.5% in Karnataka and Uttar Pradesh and 1.3% in Orissa scored over 75% marks in literacy test. In all the three states, students' achievement in reading comprehension was higher than that in reading aloud and writing.

Development of numeracy skill was observed to be inadequate with more than half of the students scoring below 40% marks in the numeracy test in Karnataka (60.7%) and Orissa (53.7%), However, in Uttar Pradesh only 15% of the students scored below 40% marks.

It is thus clear that literacy and numeracy level of children who had reached the last grade of primary cycle in Uttar Pradesh and Orissa was much below the level that was expected after four years of schooling.

CHAPTER –I

Introduction

1.1   Background

One of the objectives of the District Primary Education Programme (DPEP) that was launched in 1994 in 42 districts of seven states was to raise average achievement levels by at least 25 percent over measured baseline levels and ensuring achievement of basic literacy and numeracy competencies and a minimum of 40 percent achievement levels in other competencies by all primary school children.

As required for assessing the progress made under DPEP, Baseline, Mid-term and Terminal Assessment Surveys (BAS, MAS and TAS) were conducted to monitor the change in achievement level of students in language and mathematics at the end of grade I and also at the end of the penultimate grade of primary stage.

This report is of a study on achievement of students of classes IV/V conducted in Karnataka, Orissa and Uttar Pradesh. In these states District Primary Education Project was implemented between 1997-98 and 2002-03 in a few selected districts. In the three states for which the findings are reported here, TAS was conducted in 2002-03 in 33 DPEP districts (7 districts in Karnataka, 8 in Orissa and 18 in Uttar Pradesh).For this study two districts from each state were selected to assess the achievement of the students in TAS tests after two years of TAS and the level of literacy and numeracy attained by them.

1.2   Objectives

Specially, in this report the following two broad objectives have been addressed.

i.   To find out whether the schools have maintained or improved on their performance in respect of learning outcomes as measured by the achievement tests used in TAS for class IV in Karnataka and class V in Orissa and Uttar Pradesh.

ii.   To find out to what extent students at the end of primary cycle have acquired the basic numeracy and literacy skills.

1.3   Methodology

 From each state, two DPEP districts were selected which had medium level of achievement in TAS and which also represented two different parts of the state. The districts selected were Bellary & Mysore in Karnataka, Dhenkanal & Kalahandi in Orissa and Moradabad & Maharajganj in Uttar Pradesh.

TAS-03 was conducted in 50 schools of each district. These included both government and government aided private primary schools as well as upper primary schools that had primary

classes. According to the sampling plan adopted for TAS, the sample included proportionate number of rural & urban schools subject to a minimum of 10 schools from urban areas. In each district, 4 blocks were selected, one of them being a tribal block if the district had tribal blocks. Selection of blocks and schools was done at random within each stratum or category of schools.

For this study, the same 50 schools in which TAS was conducted in 2003 were selected in each district. This was done to control the school variables in assessment of change in the mean achievement scores of students between TAS and the present study. The study was confined to class IV students in Karnataka where the primary cycle comprises classes I to IV, and to class V students in the other two states where the primary cycle comprises classes I to V.

Tests were administered to class IV students in Karnataka and to class V students in Orissa and Uttar Pradesh. If in any school there were 30 or less students all students were tested. In the case of a larger class, a random sample of 25 students from each class was selected. In the case of schools having 2 or more sections of targeted class, only one section was selected at random.

TAS results of 2003 for the sampled schools in the districts were obtained from the office of the State Project Director or SCERT by the State Coordinator. Since SCERT was made responsible for conducting the achievement survey at state level in 2003.

The tests of Language and Mathematics used in this survey were the same as were used in TAS but the tests for Literacy and Numeracy were developed by RESU, a unit of Technical Support Group for SSA, specifically for this study. The Maths tests were translated into regional language while the language tests were adapted suitably wherever necessary. Translated /adapted versions of these tests and other tools were pre-tested in 5-10 schools before finalization in each state.

1.4   Tests used in the study

The TAS tests used in the present survey were the same as were used in BAS (1997), MAS (2000) and TAS (2003).These tests were:

(1)   Mathematics test for class IV (with 40 items)
(2)   Mathematics test for class III (with 40 items)
(3)   Language test for class IV (in Oriya for Orissa and in Hindi for Uttar Pradesh). It had two parts.
   – *Reading Comprehension*: The test had total 35 items to test comprehension of passages after reading.
   – *Word Knowledge*: This test also had 35 items, which tested knowledge of synonym or antonym of given words.
(4)   Language test for class III (in Kannad for Karnataka). It had two parts
   – *Reading Comprehension:* The test comprised 35 items
   – *Word Knowledge*: This test had 30 items to test knowledge of synonym or antonym of 30 given words.

Class III tests were used in Karnataka whereas class IV tests were used in Orissa and Uttar Pradesh. The tests were based on the syllabus covered in classes III and IV respectively but were administered to students who had got promoted to the next class.

The following tests developed specifically by RESU for the present study were meant for assessing Literacy and Numeracy level of the students.

(1) **Numeracy test:** This test had a few simple items on addition, subtraction, multiplication of three digit numbers by two or three digit numbers and division of three digit numbers by a single digit or two digit number. A few problem sums were also included.

(2) **Literacy test:** It had three parts, one for assessing reading ability, one for writing skills and one for reading comprehension.

 a)   **Reading skill test:** It had two parts, one for word reading and the other for reading a simple passage consisting of 5-6 simple sentences.

   i)   *Word Reading test*

   It had 15 words of different difficulty levels to test the reading ability of the students. Students had to read each word loudly. Each student was tested individually and the scores were given on the spot. The criteria for marking were correct pronunciation and fluency in reading.

   ii)   *Passage Reading* **test**

   A story was divided into six parts of equal length, each part consisting of 5-6 sentences.. Due care was taken to select the story where the difficulty level remains same throughout. Each student was asked to read aloud one of the six parts. Marks were given on the spot based on fluency, pronunciation and errors made while reading.

b) Writing skill test

In order to test the writing skill of students, a picture was shown to the students for 5 minutes and then each student was asked to write a few sentences or a story based on their observation of the picture. The picture that was used is reproduced on page 26.

> *Instructions (for Writing skill test)*
>
> *Look at the picture that is being shown. Write a few sentences about what you see in the picture. You can also make a story on it, if you like.*

The students' written answers were evaluated by teachers on the following criteria: (i) legibility and formation of letters including spacing and alignment (ii) number of words/sentences written

(iii) sentence construction (iv) type, connectedness and variety in the pattern of sentences (v) number of spelling errors (vi) content relevance and coverage of items in the picture and (vii) expression of ideas and evidence of imagination while describing the picture.

c) Reading Comprehension test

This test had six paragraphs It is a cloze test in which students were required to choose the most appropriate word out of three given alternatives to fill in blank spaces.

In the following chapters, the findings of the study are summarized based on the reports of the study of three States: Karnataka, Orissa and Uttar Pradesh.

CHAPTER –II

Comparison of achievement level with TAS-03, MAS-01 and BAS-98

The main question to which answer was sought in the present study was: have the schools maintained or improved on their performance in respect of learning outcomes as measured by the achievement tests used in TAS after two years of TAS-2003.

2.1 Change in mean scores between Terminal Assessment Survey (TAS-03) and Repeat Assessment Survey (RAS-05)

Students' achievement level was compared with the achievement level of students of the same grade in the same schools two years earlier when Terminal Assessment Survey (TAS) was conducted for DPEP. The same tests in language and mathematics that were used in TAS were administered to the students in this study for checking whether the achievement level had remained the same or had improved or declined after a gap of 2 years since the completion of DPEP. Class III tests were used in Karnataka whereas class IV tests were used in Orissa and Uttar Pradesh.

Comparison of mean scores (expressed as percentage of maximum marks) in language and mathematics in TAS of 2003 (TAS-03) was made with the mean scores of the present Repeat Assessment Survey (RAS-2005) to see whether there was any significant increase or decrease in achievement level of students two years during which inputs and support were given to schools under SSA after DPEP ended.

The average achievement could be considered as satisfactory in Uttar Pradesh but quite poor in Karnataka and Orissa, the mean scores (average of two districts) in language and mathematics respectively, being 60.7 and 54.5 in Uttar Pradesh; 28.0 and 27.1 in Karnataka and 50.1 and 38.9 in Orissa.

Chart 1   Mean (%) score in TAS (03) and RAS (05)

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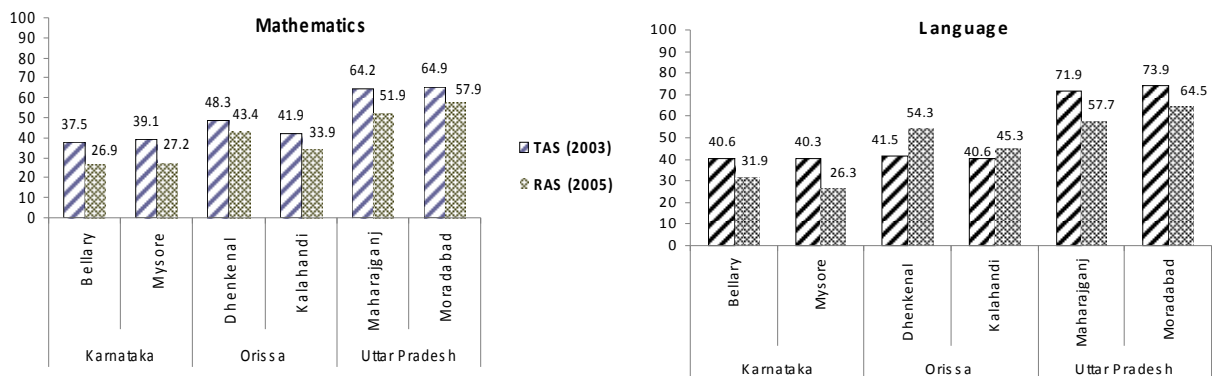
In Orissa, there was decrease in the mean score of Mathematics while there was an increase in mean score of language in both districts between TAS and the present the Repeat Assessment Survey (RAS). In Dhenkenal, the mean score declined from 48.3 in TAS to 43.4 in RAS in Mathematics and increased from 41.5 in TAS to 54.3 in RAS in Language. In Kalahandi, the mean score declined from 41.9 in TAS to 33.9 in RAS in mathematics and increased from 40.6 in TAS to 45.3 in RAS in language.

In Uttar Pradesh, in both the districts achievement scores showed decline in both subjects Language and Mathematics between TAS and RAS. In Maharajganj, the mean score declined from 64.2 in TAS to 51.9 in RAS in Mathematics and from 71.9 in TAS to 57.7 in RAS in Language. In Moradabad, the mean score declined from 64.9 in TAS to 57.9 in RAS in mathematics and from 73.9 in TAS to 64.5 in RAS in language.

In Karnataka too, the achievement scores showed considerable decline. In mathematics, the mean scores in TAS were 37.5 in Bellary and 39.1 in Mysore which declined to 26.9 and 27.2 respectively in RAS-05. Similarly in language, achievement scores in TAS were 40.6 in Bellary and 40.3 in Mysore which declined to 31.9 and 26.3 respectively in RAS-05.

2.2 Pattern of Change between BAS - 98 and RAS-05

Under DPEP, Baseline, Mid-term and Terminal Assessment Surveys (BAS, MAS and TAS) were conducted to monitor the progress made in improving the achievement of students in language and mathematics at the end of Grade I and at the end of the penultimate grade of primary stage, as a result of DPEP interventions. Table 1 shows the mean scores in language and mathematics in all the three surveys BAS-98, MAS-01, and TAS-03 along with mean scores in the present survey, RAS – 05 for all the six districts of the three states.

Table 1: Mean Achievement (%) score in the different Assessment Surveys

MATHEMATICS				
KARNATAKA	**BAS (1998)**	**MAS (2001)**	**TAS (2003)**	**RAS (2005)**
1. Bellary	25.1	26.9	37.5	26.9
2. Mysore	25.7	55.6	39.1	27.2
ORISSA				
1. Dhenkenal	39.7	54.8	48.3	43.4
2. Kalahandi	30.7	32.9	41.9	33.9
UTTAR PRADESH				
1. Maharajganj	40.6	44.4	64.2	51.9
2. Moradabad	34.9	60.4	64.9	57.9
LANGUAGE				
KARNATAKA	**BAS (1998)**	**MAS (2001)**	**TAS (2003)**	**RAS (2005)**
1. Bellary	41.5	32.9	40.6	31.9
2. Mysore	36.8	34.4	40.3	26.3
ORISSA				
1. Dhenkenal	42.9	63.8	41.5	54.3
2. Kalahandi	41.4	45.3	40.6	45.3
UTTAR PRADESH				
1. Maharajganj	47.8	42.2	71.9	57.7
2. Moradabad	42.6	70.9	73.9	64.5

Source: Synthesis Report on Students Achievement under TAS : An appraisal in DPEP States, 2003, NCERT.
(for BAS, MAS and TAS figures).

Chart 2. Mean Achievement (%) score in Mathematics in different Assessment Surveys
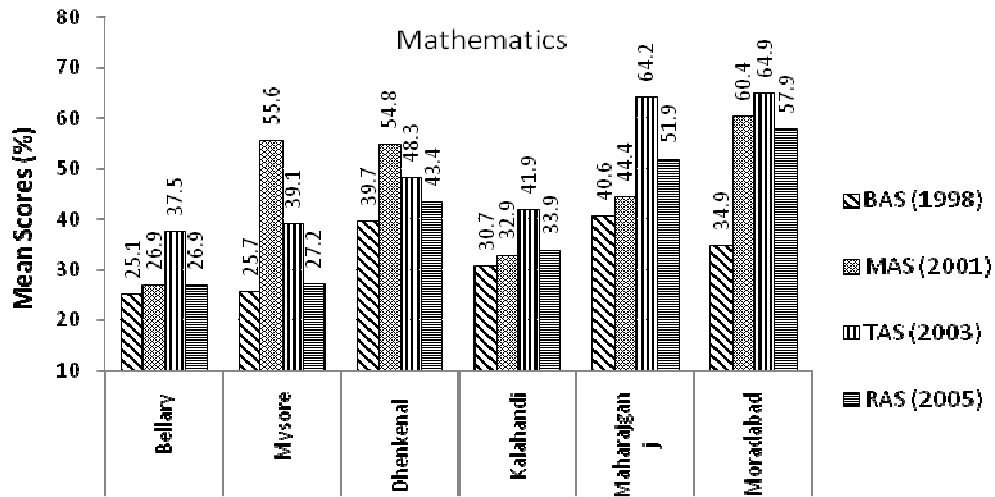
In the **mathematics** test, the two districts of Karnataka were almost at the same low level as they were in BAS (1998). In Mysore, there was a spurt in achievement level between BAS and MAS, but it gradually declined after that to reach the 1998 level. In Orissa between BAS and TAS there was some improvement but after that there was a decline. In both districts of Uttar Pradesh, the mean scores in RAS-2005 were higher than those of BAS. However, the large improvement that took place between BAS and TAS in both the districts was not sustained after that and the mean scores declined again substantially in both the districts.

Chart 3. Mean Achievement (%) score in Language in different Assessment Surveys.
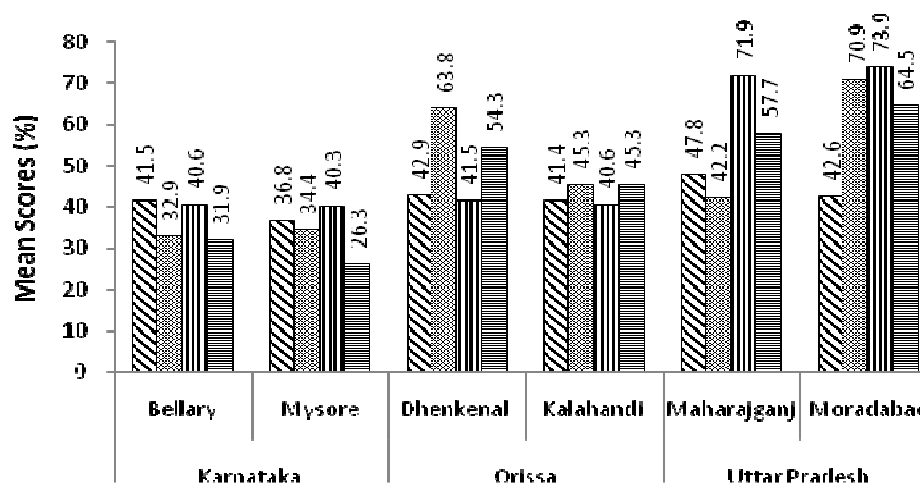
In the **language** test, the mean scores in Karnataka districts in RAS (2005) were lower than even those of BAS (1998). In these districts, there was a decline between BAS and MAS, then there was some improvement between MAS and TAS, but again there was sharp decline. The mean scores did not change much over the years in Kalahandi district in Orissa but in Dhenkanal, while there was a large increase in the mean scores between BAS and MAS, there was a decline

after that between MAS and TAS and again a large increase after that. In Uttar Pradesh, in one district (Maharajganj), after some decline between BAS and MAS, there was a large increase in the mean score between MAS and TAS after which there was some decline again, but despite the decline the mean score in RAS remained much above that of BAS. In the other district, Moradabad, there was considerable increase in the mean score between BAS and MAS which further increased slightly in TAS but decreased after that by about 10 percentage points in RAS-2005. But the mean score in RAS remained much above that of BAS.

Only in the two districts of Uttar Pradesh, the mean score was more than 50% in RAS – 2005 in both subjects. It was above 50% only in one of the other four districts, namely Dhenkanal and that too only in language

CHAPTER –III

Competency-wise and Item-wise mean scores in Repeat Assessment Survey-05

3.1 Students' performance on various items of class IV test of Mathematics

Table 2 shows Facility Values of the different items of **Mathematics** test (in Orissa and Uttar Pradesh) along with information on competency tested by the item and the type of ability or skill test by it. The ability tested is broadly divided into 4 categories: Knowledge (K), understanding (U), Computation skill (C)and Application (A). In all there are 12 Knowledge items,12 Understanding items, 6 Computation skill items and 10 Application items. Forty items of the test can be divided in 12 broad categories according to the topic/ subject area covered by each item . In the case of Karnataka, item scores were not included in the state report since scoring was done manually and hence these are not reported in the following table.

Table 2: Facility Values of items of Mathematics test

Sl. No.	Topic	Item No.	Competency	Skill tested	Orissa	U. P.
1	Addition	1	Addition of four digits number with carry over	C	81.2	94.9
		8	Problem sum on addition	U	35.5	53.1
			Sub total (Average)		**58.4**	**74.0**
2	Subtraction	5	Subtraction with no borrowing	U	69.8	84.2
		6	Subtraction with borrowing	U	51.2	58.5
		7	Solving problem sum on subtraction involving borrowing with zeros in between,	U	36.0	54.0
			Sub total (Average)		**52.3**	**65.6**
3	Time	2	Counting days between two dates	C	**57.0**	**50.6**
4	Place value	3	Determining place value of a digit in 6 digit number when possible answers were given in increasing sequence	U	54.4	75.5
	(Thousand)	4	Determining place value of a digit in 6 digit number when possible answers were arranged haphazardly.	U	46.1	65.9
			Sub total (Average)		**50.3**	**70.7**
5	Numbers	9	Reading a 6 digit number	K	42.3	80.6
		10	Identifying the numeral for a 6 digit number written in words	K	63.3	82.0
		11	Identifying correct expanded form of a 6 digit number	K	39.4	42.9
			Sub total (Average)		**48.3**	**68.5**
6	Multiplication	12	Concept of multiplication by zero	U	55.7	71.8
		13	Understanding of process in multiplication of 4 digit number by a 2 digit number	U	45.4	71.8
		14	Understanding of process in multiplication of 3 digit number by 2 digit number	U	26.1	39.6
		17	Problem sum on money	A	31.9	42.5
			Sub total (Average)		**39.8**	**56.4**

Sl. No.	Topic	Item No.	Competency	Skill tested	Orissa	U. P.
7	Unitary method	15	Problem sum using unitary method ; (involving division & multiplication)	A	45.9	63.4
		16		A	37.3	63.0
		18	Problem sum on money involving addition & subtraction	A	46.2	72.1
			Sub total (Average)		**43.1**	**66.2**
8	Division	19	Problem sum on division (without remainder)	A	43.1	51.7
		20	Simple division with zeros in divisor and divider	C	36.4	50.4
		21	Simple division with zero in middle	C	24.5	41.2
		22	Knowledge of terms used in division sums (e.g. divisor, quotient)	K	19.2	41.9
		25	Identifying a prime number (among numbers less than 20)	K	37.3	54.1
			Sub total (Average)		**32.1**	**47.9**
9	Identification of fig.	23	Knowledge of simple geometrical terms and shapes (triangle . angle)	K	50.4	73.2
		24	Recognising geometrical shape/s	K	51.8	81.3
			Sub total (Average)		**55.1**	**77.3**
10	LCM	26	Finding LCM of two numbers (both < 20)	K	35.4	42.4
		27	Knowledge of prime factors	K	20.8	36.6
			Sub total (Average)		**28.1**	**39.5**
11	Fraction	28	Knowledge of decimal form for a fraction (1/10)	K	27.9	37.6
		29	Converting a fraction into a number	C	15.5	33.1
		30	Identify the equivalent form of a given	U	27.4	36.7
		31	fraction	U	26.6	39.8
		32	Knowledge of process for conversion of a fraction into its simple form	K	33.1	44.0
		33	Knowledge of simple fraction	K	23.6	27.1
		34	Finding out the fraction that shaded form in a figure represent	U	45.2	34.0
			Sub total (Average)		**28.5**	**36.0**
12	Measurement	36	Addition of two distance (kilometer & meter)	C	43.7	60.6
		35	Problem sum on division requiring knowledge of weight	A	32.5	59.4
		38	Problem sum on subtraction including weight,	A	27.6	48.8
		40	Problem sum on multiplication inolving weight	A	16.7	33.0
		39	Problem sum on multiplication involving measure of length;	A	26.3	47.4
		37	Problem sum on division requiring knowledge of capacity measure (lt. & ml.)	A	26.1	40.8
			Sub total (Average)		**28.8**	**48.3**
			TOTAL (Average)		**40.2**	**56.2**

C= computational skill ; K= Knowledge; U = understanding, clarity of concept; A = Application

Chart 4   Mean (%) Scores on different Numerical Skills
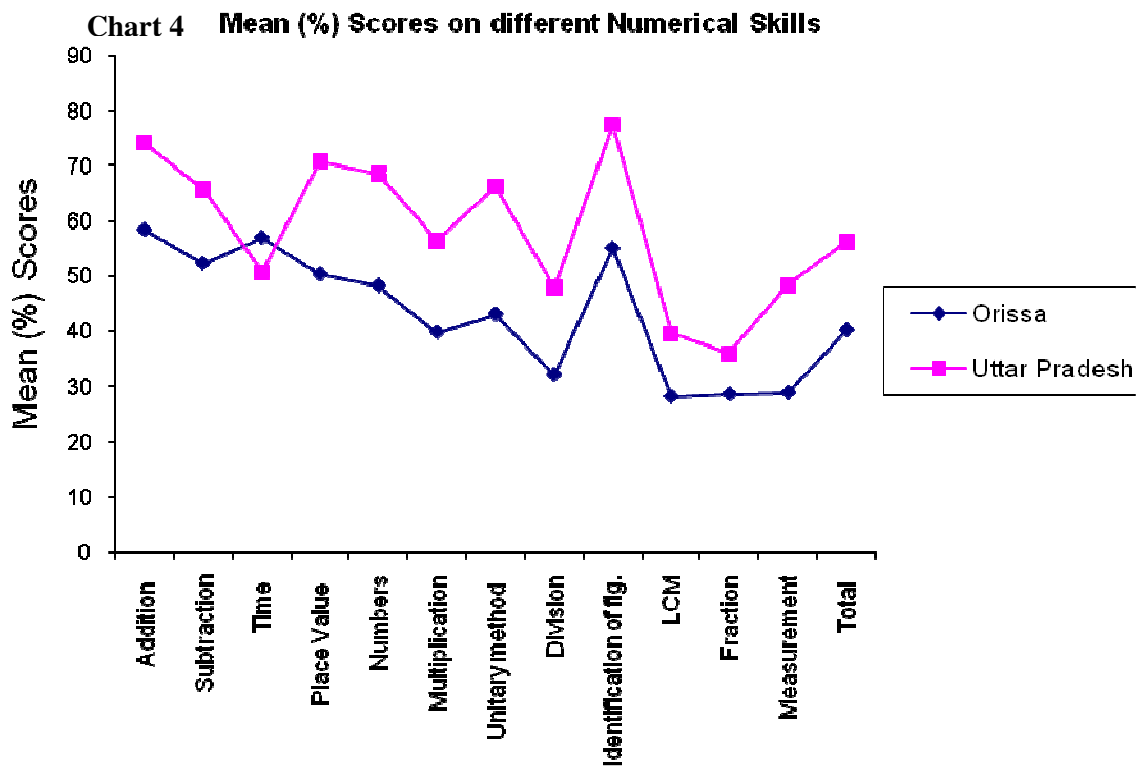
Overall, students' performance in **Orissa** was less than 40 percent on items involving the operation of multiplication, division, LCM, fraction and measurement. Highest achievement score was on addition sums (58.4%) followed by counting of days between two dates (57%), subtraction (52.3%), identification of geometric figures (51.1%), place value (50.3%) and knowledge of numbers (48.3%).

In **Uttar Pradesh,** students' performance was less than 40 percent on items of LCM (39.5%) and Fractions (36%). Students' achievement was above 60% on identification of geometrical shapes (77.3%), addition sums (74%), followed by place value (70.7%), knowledge of numbers (68.5%), subtraction (65.6%), counting days between two dates (50.6%), and unitary method (66.2%). Their average achievement on multiplication (56.4%), measurement (48.3%) and division (47.9%) was nearly 50% or above.

Chart 5   Mean % scores on sum of Addition
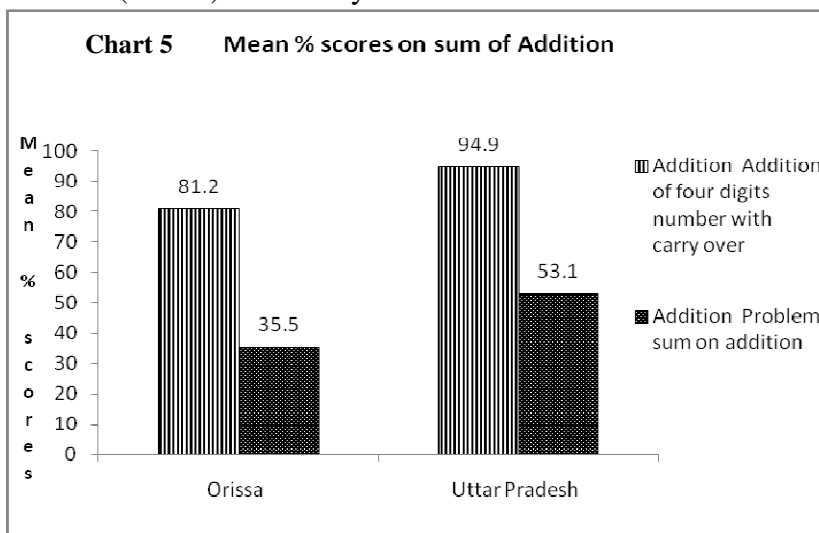
On sums of **Addition**, students achievement on simple four digit addition (Item 1) could be considered of mastery level in both Uttar Pradesh (94.9%) and Orissa (81.2%) but there was a substantial decline in performance when some understanding was required in doing an addition sum (Item 8)as observed in Uttar Pradesh (53.1%) and Orissa (35.5%)

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Chart 6   Substraction sums

Legend:
- Subtraction with no borrowing
- Subtraction with borrowing
- Solving problem sum on subtraction involving borrowing with zeros in between,

Orissa: 69.8, 51.2, 36
Uttar Pradesh: 84.2, 58.5, 54
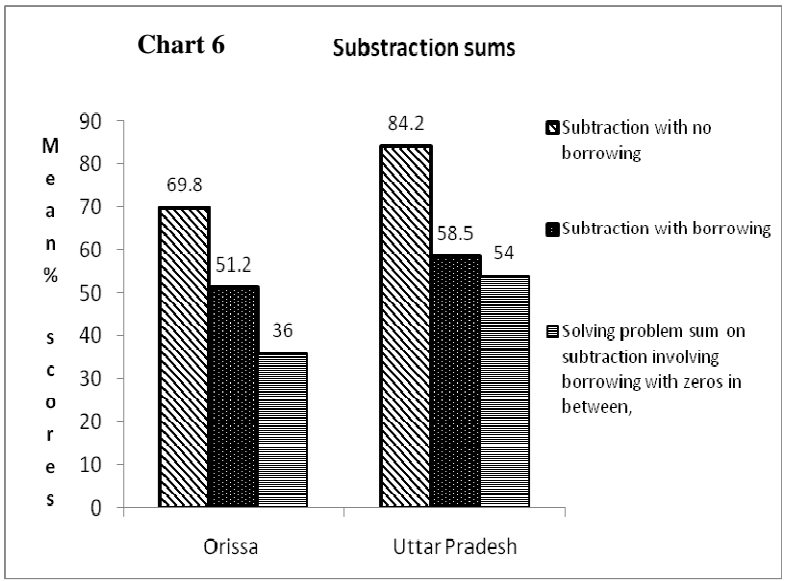
Similarly in **Subtraction** sums students' achievement was nearly 70% or more in Orissa (69.8%) and Uttar Pradesh (84.2%) in simple subtraction sum with four digit numbers with no borrowing involved (Item 5); their achievement declined by nearly 15 percent points in sums involving borrowing (Item 6) and when it came to problem sums involving borrowing with zeros in between (Item 7) the achievement decline was by 30 percent points in Utter Pradesh (from 84.2% to 54%) from 69.8% to 36% in Orissa (36%).

Chart 7   Multipication sums

Legend:
- Concept of multiplication by zero
- Understanding of process in multiplication of 4 digit number by a 2 digit number
- Understanding of process in multiplication of 3 digit number by 2 digit number
- Problem sum on money

Orissa: 55.7, 45.4, 26.1, 31.9
Uttar Pradesh: 71.8, 71.8, 39.6, 42.5
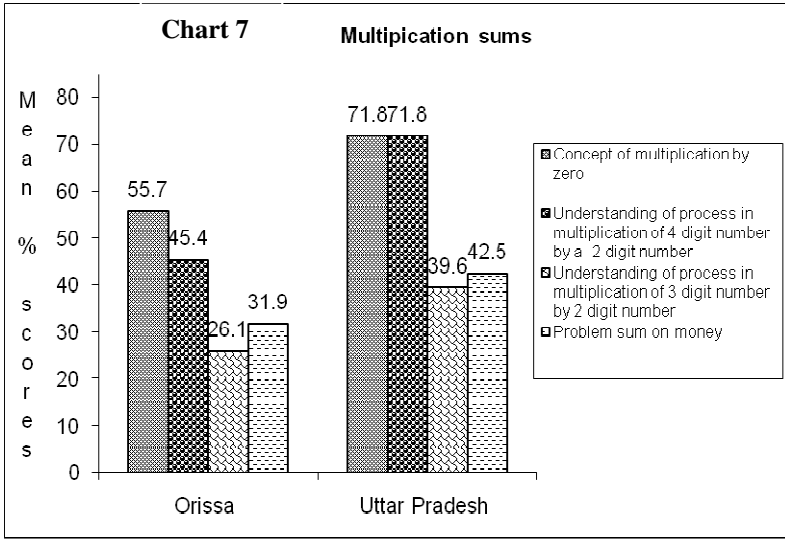
Problem sum involving **multiplication** (item 17) was found to be more difficult for students in Orissa (31.9%) and Uttar Pradesh (42.5%). Performance on a simple multiplication sum involving concept of multiplication by zero (Item 12) was much better in both Orissa (55.7%) and Uttar Pradesh (71.8%). In Uttar Pradesh, over 70% students understood the process of multiplication and what multiplication by Zero means.

Chart 8   Division sums

Legend:
- Problem sum on division (without remainder)
- Simple division with zeros in divisor and divider
- Simple division with zero in middle
- Knowledge of terms used in division sums (e.g. divisor, quotient)
- Identifying a prime number (among numbers less than 20)

Orissa: 43.1, 36.4, 24.5, 19.2, 37.3
Uttar Pradesh: 51.7, 50.4, 41.2, 41.9, 54.1
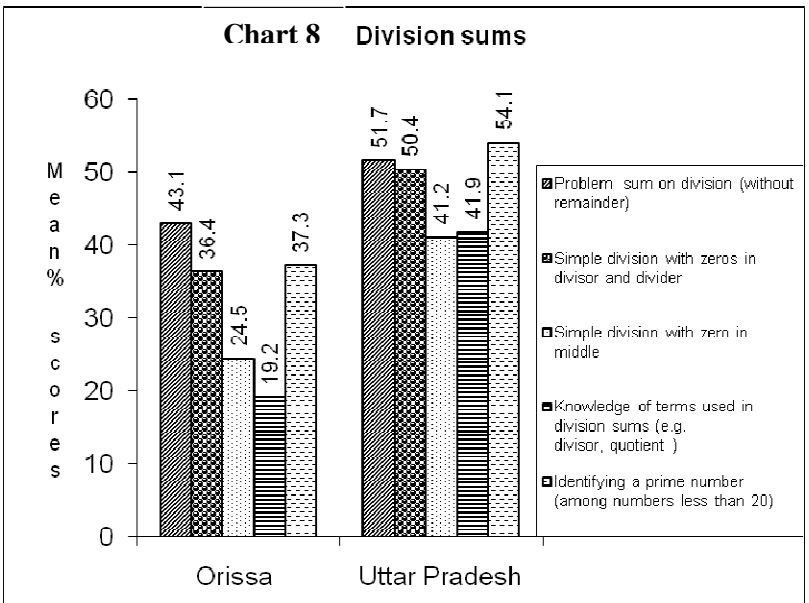
The performance on **division sums** was rather poor in both states. On simple division sums requiring division by 200 or 2 (Item 20, & 21,) the mean scores were quite low in Orissa and rather average in Uttar Pradesh. Students, lacked knowledge of technical terms like 'divisor' and 'remainder' particularly, in Orissa.

12

Chart 9   Numbers
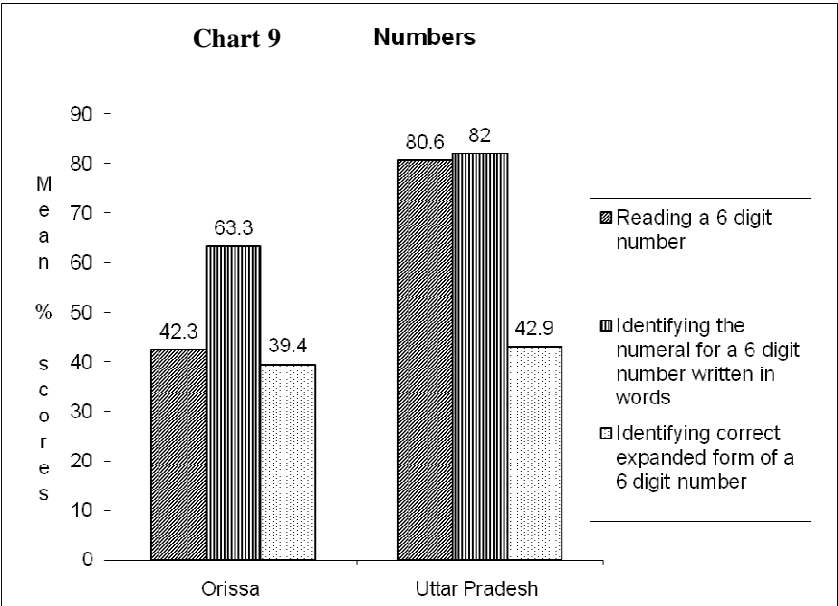
Children found it difficult to identify correct expanded form of a 6 digit number in both states with nearly 60% of the children not being able to do so. In U.P. this was peculiar as more than 80% of the children could correctly identify the 6 digit number but were not able to do so well in identifying the correct expanded form. Much efforts are needed to make the students comprehend aspect.

Chart 10   Time
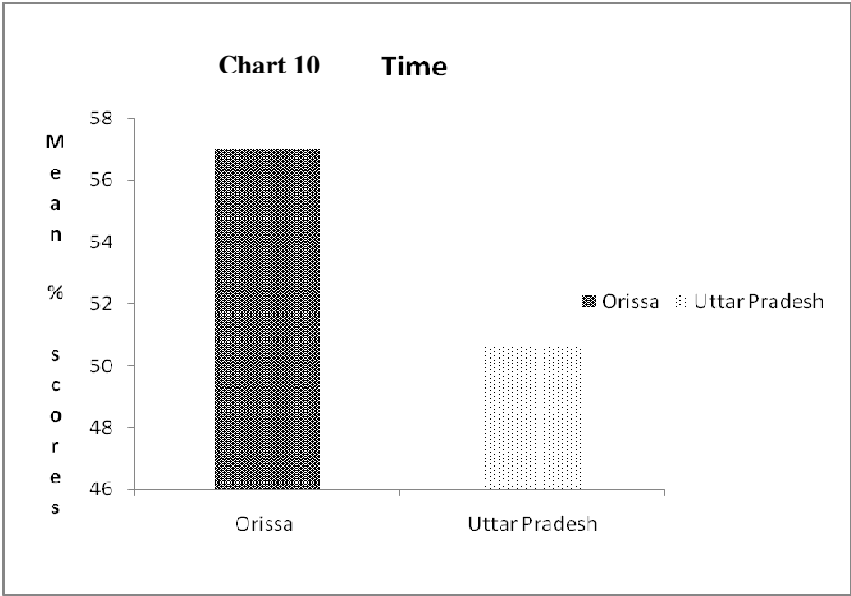
In both the states half of the children were able to do this sum correctly. Children's performance was little higher in Orissa (57%) compared to U.P (50.6%).

Chart 11   Identification of Figure
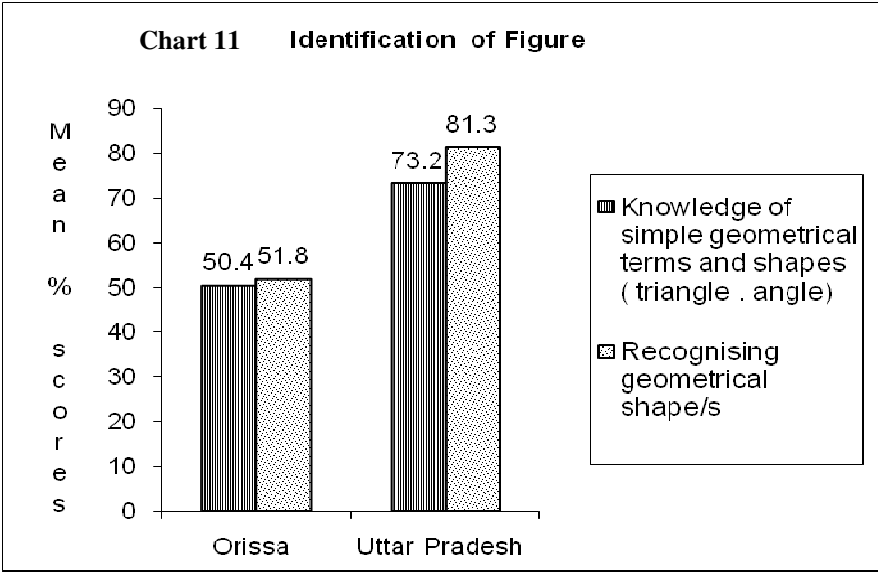
Children from both states performed relatively better on this aspect.

Chart 12   Sums of LCM

Finding LCM of two numbers (both < 20)

Knowledge of prime factors

Orissa: 35.4, 20.8
Uttar Pradesh: 42.4, 36.6
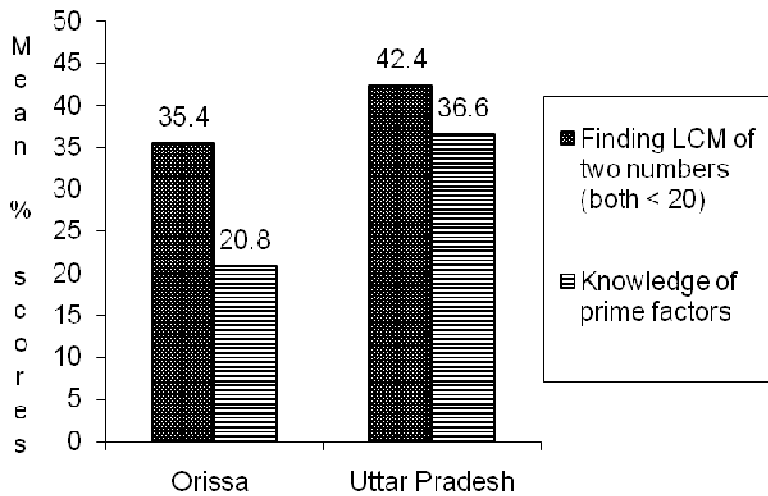
Students' achievement was low on sums of LCM (finding least common multiple) with only about 40% of the students being able to do the sum correctly. Knowledge of prime factors was also very poor among the students, particularly in Orissa

Chart 13   Sums on Fraction

Orissa: 27.9, 15.5, 27.4, 26.6, 33.1, 23.6, 45.2
Uttar Pradesh: 37.6, 33.1, 36.7, 39.8, 44, 27.1, 34

- Knowledge of decimal form for a fraction (1/10)
- Converting a fraction into a number
- Identify the equivalent form of a given
- fraction
- Knowledge of process for conversion of a fraction into its simple form
- Knowledge of simple fraction
- Finding out the fraction that shaded form in a figure represent

No question was answered correctly by more than 45% students in either state. The performance on items of fraction was particularly poor in Orissa.

Chart 14   Sums using Unitary Method

Orissa: 45.9, 37.3, 46.2
Uttar Pradesh: 63.4, 63, 72.1

- Problem sum using unitary method ; (involving division & multiplication)
- Problem sum using unitary method ; (involving division & multiplication)
- Problem sum on money involving addition & subtraction
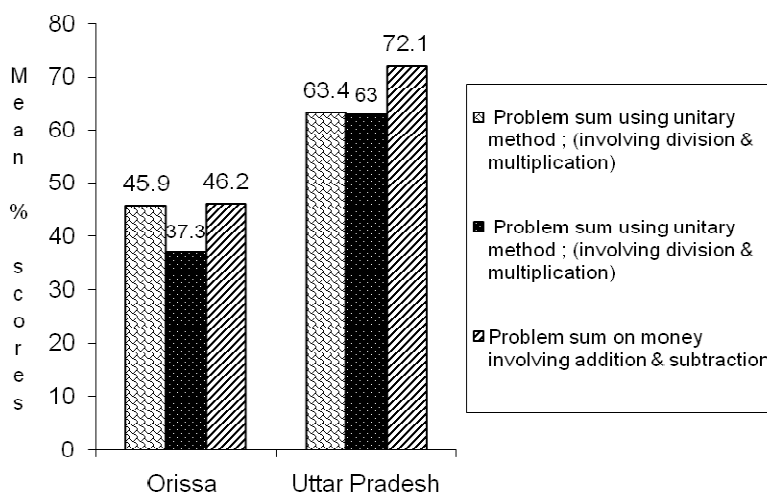
Students' achievement on **problem sums** on subtraction, multiplication and division requiring knowledge of measures for weight, length and capacity, was quite poor in Orissa but fairly good in Uttar Pradesh, where over 60% students answered the questions correctly.

Chart 15 Sums invovling Measurement

Legend:
- ▤ Addition of two distance (kilometer & meter)
- ▥ Problem sum on division requiring knowledge of weight
- ▨ Problem sum on subtraction including weight,
- ▦ Problem sum on multiplication inolving weight
- ▧ Problem sum on multiplication involving measure of length;
- ▩ Problem sum on division requiring knowledge of capacity measure (lt. & ml.)

Orissa values: 43.7, 32.5, 27.6, 16.7, 26.3, 26.1
Uttar Pradesh values: 60.6, 59.4, 48.8, 33, 47.4, 40.8

Problem sum on multiplication involving weight was the most difficult for students. Other problems sums also proved to be difficult, as less than 50% students answered them correctly, Exceptions were the two sums (one involving addition of distances and one, a simple division sum in involving weight measures)in which mean scores were about 60% in Uttar Pradesh.

Chart 16 Sums on Place Value

Legend:
- ▨ Determining place value of a digit in 6 digit number when possible answers were given in increasing sequence
- ▩ Determining place value of a digit in 6 digit number when possible answers were arranged haphazardly.

Orissa: 54.4, 46.1
Uttar Pradesh: 75.5, 65.9
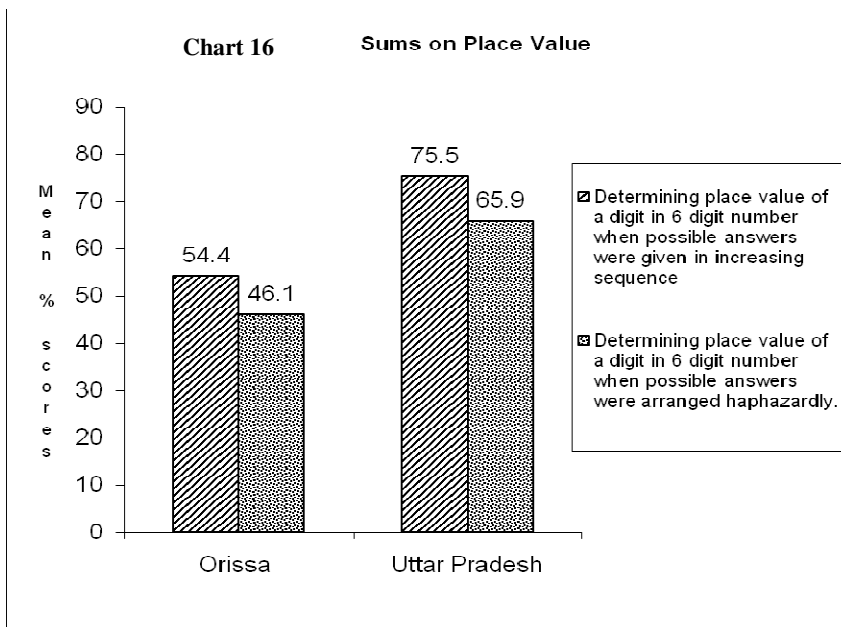
Decrease in % of students identifying correct answer when possible answers are not arranged in a sequence indicate need for more clarity of the concept. The overall performance was good in Uttar Pradesh and rather average in Orissa.

3.2 Students' Performance on various items of class IV test in Language

Table 3 shows mean achievement scores on items of **Language Comprehension test** along with the skill or ability being tested through each item. The test included 35 multiple choice items which were classified broadly into five categories depending on the complexity of information to be derived from the passage to answer the question. (i) Direct information (14 items) (ii) Connected information (9 items), (iii) Inference (7 items) (iv) Central idea (4 items) and (v) Word meaning (1 item).

Table 3: Facility values of items in language Reading comprehension tests.

Sl. No.	Skill/ability	Q.No.	Orissa	Uttar Pradesh
1.	**Direct information** (information given in text is repeated in almost same words in the correct alternative)	1	70.0	99.7
		2	66.7	86.5
		8	40.7	77.8
		13	53.4	77.1
		15	31.9	56.7
		16	34.5	60.8
		17	38.3	53.0
		19	55.0	82.9
		24	44.8	67.3
		25	59.3	84.5
		26	24.1	55.9
		27	41.9	72.3
		30	44.8	82.7
		32	40.1	61.8
	Sub total (Average)		**46.1**	**72.8**
2.	**Connected information** (information from the text can be easily derived to identify the correct alternative)	3	52.8	67.9
		9	63.0	81.7
		10	60.2	74.2
		14	36.6	50.7
		20	50.1	75.2
		21	49.0	76.9
		22	48.9	68.1
		28	35.8	53.2
		31	36.3	55.7
	Sub total (Average)		**48.1**	**67.1**
3.	**Inference** (Interpretation or understanding of the contextual meaning is required for selecting the correct alternative)	4	35.1	54.9
		5	51.0	67.6
		6	38.9	53.9
		11	32.1	64.7
		18	31.2	47.7
		23	54.9	38.1
		33	33.6	60.2
		34	33.3	60.6
	Sub total (Average)		**38.8**	**56.0**
4.	**Central idea** (For selecting the correct alternative understanding of the entire text and identification of the central idea of the given passage is required)	7	36.2	49.9
		12	42.8	66.6
		29	38.2	58.5
		35	38.5	54.3
	Sub total (Average)		**38.9**	**57.3**
5.	**Word meaning** (knowledge of the meaning of a difficult word given in the text is required)	18	**31.2**	**47.7**
	Total (Average)		**40.6**	**60.2**

Chart 17   **Mean (%) Scores - Language Comprehension**
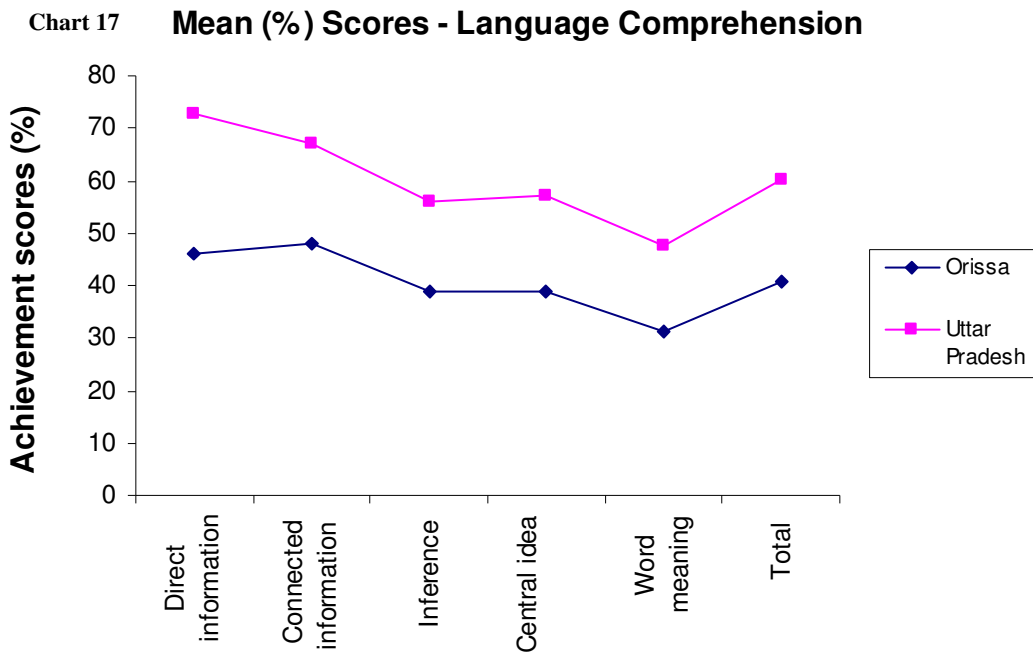
It was observed that students' mean achievement in Orissa on items requiring direct information was (46.1%), connected information (48.1%), inference (39.8%), central idea (38.9%) and word meaning (31.2%). In Uttar Pradesh, the performance was relatively better with students mean achievement on items of direct information being (72.8%), connected information (67.1%), inference (57.1%), central idea (57.3%) and word meaning (47.7%).

3.3   Item analysis and Reliability of test scores

The facility values (percentage of students answering a question correctly) of test items have been reported and already discussed above. The Dissemination Index of the test items obtained from Item Analysis are reported in Annexure I for both language and mathematics tests based on test administration in Orissa and Uttar Pradesh. The following table shows the KR-20 reliability of the tests.

Table 4: Reliability coefficient of the tests used

State	Mathematics	Word Knowledge	Language Comprehension
Orissa	0.879	0.859	0.867
Uttar Pradesh	0.637	0.492	0.717

The reliability coefficients of the tests in Mathematics and Language comprehension and quite high in Orissa. The reliability coefficient of the test of Word knowledge is rather low in Uttar Pradesh 0.492 while it is high in Orissa (0.859).

`Discrimination Index' was calculated for the items of the three tests used in Orissa and Uttar Pradesh. The information about the Discrimination Index (DI) of the test items in the two states has been consolidated below. The value of DI were calculated. (For details refer Annexure II)

Table 5: Discrimination Indies of tests

Mathematics

State	< 20	21-30	31-40	41-50	51-60	61-70
Orissa	29 (**1**)	8,22,27,39,40 (**5**)	1,5,9,21,26,30,33,3 (**8**)	2,11,14,28,35,38 (6)	4,6,7,13,15,16,17,31,32,36,37 (**11**)	3,10,12,18,19,20,23,24,25,34 (**10**)
Uttar Pradesh	1,24,34 (**3**)	2,5,18,21,22,27,33 (**7**)	3,8,9,10,11,12,13,15,16,17,23,26,28,31,32,36,37,38,39,40 (**20**)	4,6,7,19,20,29,30,35 (**8**)	14,25 (**2**)	-

Word Knowledge

State	< 20	21-30	31-40	41-50	51-60	61-70
Orissa	-	1,10,28 (**3**)	15,21 (**2**)	2,11,12,13,22,23,25,29,30,31 (**10**)	3,4,7,8,9,16,17,18,24,27,32,33,35 (**13**)	5,6,14,19,20,26,34 (**7**)
Uttar Pradesh	1,11,13,25,29,32,34 (**7**)	2,4,10,12,14,24,31,32,35 (**9**)	3,6,8,16,18,20,21,22,23,27,28 (**11**)	5,7,9,26,30 (**5**)	15,17,19 (**3**)	-

Reading Comprehension

State	< 20	21-30	31-40	41-50	51-60	61-70	Above 70
Orissa	-	1,11,26 (**3**)	4,6,7,18,33,35 (**6**)	2,12,14,17,23,28,30,34 (**8**)	3,5,8,9,10,13,15,29 (**8**)	16,21,22,24,25,27,31,32 (**8**)	19,20 (**2**)
Uttar Pradesh	1,11,12,13,25,29,33,34 (**8**)	2,4,10,14,24,31,32,35 (**8**)	6,8,16,18,20,21,22,23,27,28 (**10**)	3,5,7,9,26,30 (**6**)	15,17,19 (**3**)	-	-

The value of Discrimination Index for all items in the three tests was found to be positive indicating that these items differentiate between the performance of high and low scoring students. However, the trend varied across the states in case. In Orissa more than 50% of items in case of all the three tests had Discrimination Index value above 50. In case of Uttar Pradesh only 2 to 3 items fell in this range. The test items proved to have relatively low discriminating power in Uttar Pradesh, where the test reliability was also relatively less.

CHAPTER –IV

Basic literacy and numeracy at the end of primary cycle

4.1 Literacy and numeracy

Literacy and numeracy are two necessary attributes of life skills of an individual. Literacy lays the foundation for learning and touches every aspect of life of an individual as well as community.

Literacy refers to the ability to read and write at a level adequate for communication. UNESCO has defined literacy as 'the ability to identify, understand, interpret, create, communicate, compute and use printed and written material'. The Census in India defines *literacy* as the 'ability to read and write in any language'. Literacy comprises a number of sub-skills including phonological awareness, decoding, comprehension, vocabulary and writing. These are generalized skills and children's mastery over them becomes the key factor affecting success at school

In general usage, numeracy and literacy remain bracketed together as numeracy is generally recognized as a part of literacy – arithmetic literacy. For the purpose of this study '*Numeracy'* is taken as a mastery of basic symbols and processes in Arithmetic which include knowledge of numbers, addition, subtraction, simple multiplication, simple division, and ability to solve simple problems involving measures of length , distance, time, money, weight and capacity.

4.2 Assessment of Literacy and Numeracy

Simple tests of reading and writing in language and doing simple arithmetic sums, were administered to assess the literacy and numeracy level of the students.

Numeracy test had a few simple items on addition, subtraction, multiplication of three digit numbers by two or three digit numbers and division of three digit numbers by a single digit or two digit number. A few problem sums were also included.

Reading was assessed on the spot by trained investigators with respect to correctness, fluency, attention to punctuation as well as their ability to read correctly simple words, compound words and sentences of varying complexity. Writing skill was assessed by asking them to write a few sentences to describe a given picture. For measuring comprehension, cloze type items were used. The students were required to select most appropriate word out of the three given options to write in a blank space within a sentence.

It was not enough to classify the students as literate or non-literate (illiterate in common parlance) since, students had attained different levels of literacy and numeracy. On the basis of

the scores in these tests of literacy and numeracy, the students were divided into 5 groups according to the level of literacy or numeracy attained by them:

75% or more :	Very high level of literacy/numeracy
60% to below 75% :	Fairly high level of literacy/numeracy
50% to below 60%	Medium level of literacy/numeracy
40% to below 50%	Low level of literacy/numeracy
Below 40% :	Very low level of literacy/numeracy, amounting to illiteracy

The students scoring over 50% marks can be considered as literate and other non-literate, if a dichotomous classification is required.

4.3   Literacy level of class IV/V students

Table 6 shows the percentage of students who had attained different levels of literacy in the sample of class IV/V students in the selected districts of the time states.

Table 6: Percentage distribution of students of class IV in Karnataka and class V in Orissa and Uttar Pradesh by level of literacy/numeracy attained by them.

Score range	Karnataka (class IV students)		Orissa (class V Students)		Uttar Pradesh (class V students)	
	Bellary (n=478)	Mysore (n=479)	Dhenkanal (n=885)	Kalahandi (n=784)	Maharajganj (n=1036)	Moradabad (n=808)
	%	*%*	*%*	*%*	*%*	*%*
75% & above	—	1.04	2.71	0.25	0.36	0.37
60% to < 75%	0.84	14.41	14.35	4.21	13.90	24.75
50% to <60%	17.36	20.67	20.68	11.61	34.85	38.92
40% to <50%	17.36	23.59	21.36	15.05	31.27	25.99
Below 40%	64.44	40.29	40.90	68.88	19.50	9.98

Achievement in literacy tests indicate that around only one-fourth of the students in Karnataka (27.1%) and Orissa (27.6%) could be deemed as literate. In Uttar Pradesh, the picture was better with more than half (54.2%) of students being in this group. Very few students were found to be fully literate i.e. scoring 75% and above. Only 0.5% in Karnataka and Uttar Pradesh and 1.3% in Orissa scored over 75% marks in literacy test. In all the three states, students' achievement in reading comprehension was higher than that in reading aloud and writing. It appears that the more children can read silently and understand the meaning but are not able to read fluently with correct pronunciation of words. Chart 18 shows the distribution of students by literacy level for the total of two districts in each state.

Chart 18 Literacy level of students in grade V of Uttar Pradesh and Orissa in grade IV of Karnataka
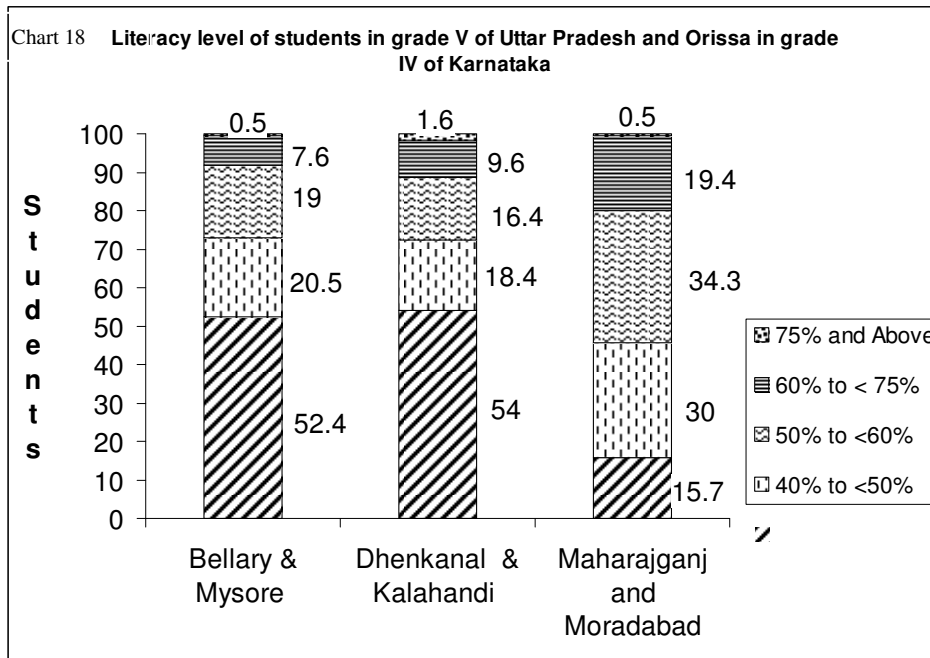
We find that in literacy (reading ability, reading comprehension & writing ability), the percentage of students who scored 75% or more marks was less than 1% in Karnataka and Uttar Pradesh and between 1.5 and 3 percent in Orissa. Thus very few students can be considered as highly literate.

The percentage of students (on the basis of the data of two districts in each state) who could be considered as moderately literate (i.e. in medium & fairly high categories) with scores between 50% and 75%, was-

- 26.6% in Karnataka
- 26.0% in Orissa
- 53.7% in Uttar Pradesh.

The percentage of students (on the basis of two districts) who had lower level of literacy (that is, who were practically illiterate) was -

- 72.9% in Karnataka
- 64.3% in Orissa
- 45.7% in Uttar Pradesh.

Among them, those who scored less than 40% marks could be considered as almost illiterate. There were 52.4% such students in Karnataka, 54.0% in Orissa and 15.7% in Uttar Pradesh. The overall low level of literacy among the students of Karnataka districts is also due to their being in class IV, whereas the students who were tested in the other two states were of class V.

4.4 *Achievement in Reading, Writing and Comprehension components of Literacy*

Reading, writing and comprehension are the three basic competencies of language. Students' achievement on each competency was looked at separately and the results are being summarized below for each state.

a) Karnataka (Bellary & Mysore)

Table 7: Basic Literacy skills of class IV students

Frequency distribution	Reading Skill (N= 956)	Writing Skill (N=956)	Comprehension (N= 956)
	%	%	%
Above 75%	0	5.6	12.9
60% to below 75%	0	15.2	18.5
50% to below 60%	7.3	11.6	17.4
40% to below 50%	31.5	13.0	7.0
Below 40%	61.2	54.6	44.2

Chart 19 Literacy skills of class IV students in Karnataka (Bellary and Mysore)
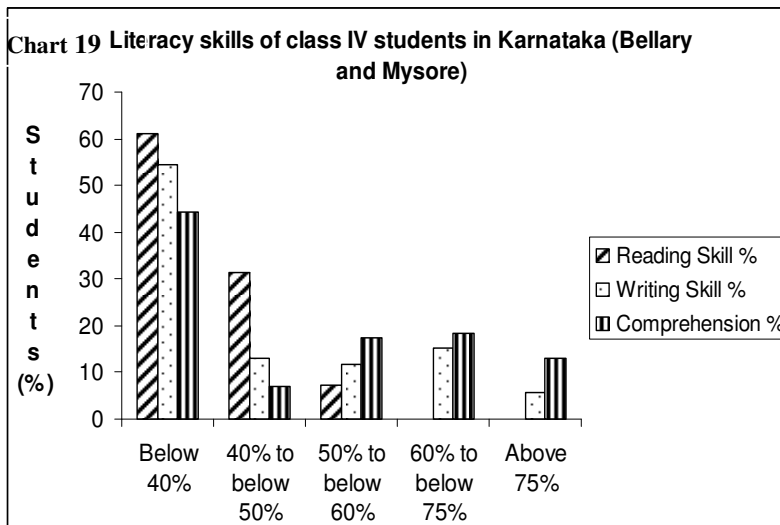
In Karnataka, the percentage of students scoring below 40% is quite large in reading skill (61.2%) and writing ability (54.6%). On the basis of the percentage of students scoring 60% or more on these skills, it can be said that students did relatively better in the tests of writing skill and reading comprehension but very badly in reading words and sentences correctly.

b) Orissa (Dhenkenal & Kalahandi)

Table 8: Basic Literacy skills of class V students

Frequency distribution	Reading Skill (N=1669)	Writing Skill (N= 1669)	Comprehension (N=1669)
	%	%	%
75% and above	19.8	0.5	21.4
60% to < 75%	19.6	2.3	21.7
50% to <60%	10.3	2.3	16.4
40% to <50%	10.9	4.1	7.8
Below 40%	39.4	90.7	32.6

Chart 20 Literacy skills of class V students in Orissa (Dhenkenal and Kalahandi)
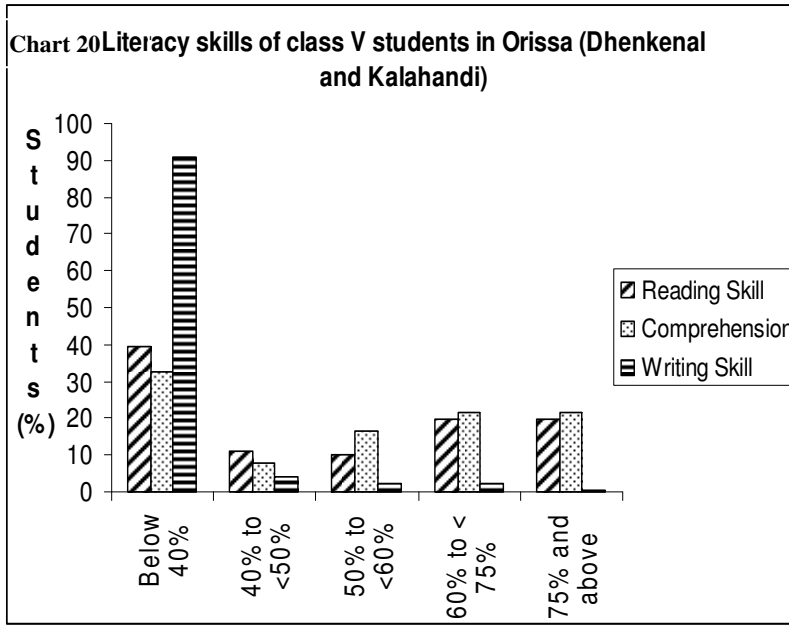
Table 7 shows that in Orissa, development of reading skill is poor with more than one third of students (39.4%) scoring below 40%. Their performance is best on reading comprehension test with 43% scoring 60% and above though nearly one third of them scored below 40%. Development of Writing skill appears to be very poor as vast majority (90.7%) of students scored below 40% marks.

c) **Uttar Pradesh (Moradabad & Maharajganj)**

Table 9: Basic Literacy skills of class V students

Frequency distribution	Reading Skill (N= 1848)	Writing Skill (N=1848)	Comprehension (N=1848)
	%	*%*	*%*
75% and above	0.1	16.2	30.2
60% to < 75%	0.9	30.8	40.8
50% to <60%	4.6	21.9	13.4
40% to <50%	13.0	15.2	10.0
Below 40%	81.5	13.4	5.7

Chart 21 Literacy skills of class V in Uttar Pradesh (Moradabad & Maharajganj)
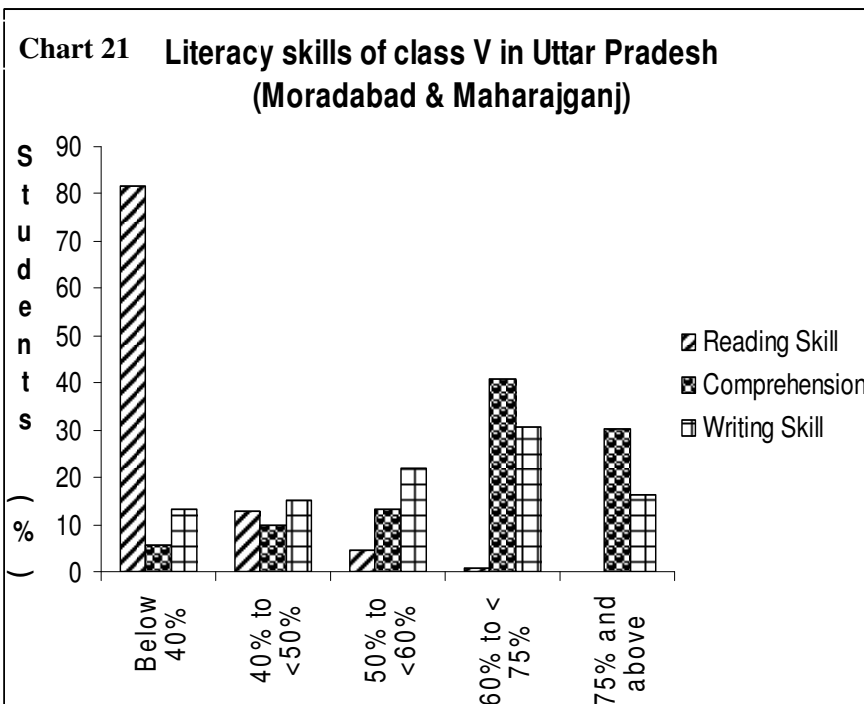
In Uttar Pradesh, the reading skill is poor with majority of the students (81.5%) scoring below 40% and only one percent scoring 60% or more. Their performance is best on comprehension test with 71% of students scoring 60% or more marks. Writing skill appears to be moderately developed with 47% of students scoring 60% or more marks and 37% falling in the middle level (40% to 60% range).

To sum up, it can be concluded that in all the three states, students' scores in reading comprehension are higher than their scores in 'reading with fluency and correct pronunciation of words' or 'writing properly without mistakes'. These skills are more dependant on formal learning experiences. For reading comprehension, it did not matter whether they could read correctly as long as they could grasp the meaning of what was written. It seems that most students are not able to read or write correctly but they can understand what they read silently.

4.5 Attainment in different competencies of Literacy

The analysis of test scores was done competency-wise in the case of Orissa and Uttar Pradesh. This could not be done in the case of Karnataka, since the tests were scored manually and item-wise scores were not available. Also in the case of Karnataka, the students who were tested were of class IV students and hence the results are not comparable with those of the other two states where the students of class V were tested. In the following section, the achievement of students in the competencies and sub-competencies of literacy are reported for two states, Orissa and Uttar Pradesh.

(i) Reading skill

The test for reading skill had two parts (a) Text reading and (b) Word reading.

(a) Text reading: For assessing the text reading skills the students were asked to read a small part of a given story (110 to 130 words in 10 to 12 sentences). The marks were given on the spot based on the fluency, attention to punctuation marks, pronunciation and errors made while reading. The students' performance on the reading skill is summarized below. Across the states, the story to be read was the same; only the script was different.

Table 10: Reading skill of class V students

Remarks/Observation	Orissa (% of students)	Uttar Pradesh (% of students)
Student reads fluently with no error in pronunciation and pays attention to punctuation marks at all places.	1.1	-
Student reads fluently with good speed, no error in pronunciation, pays attention to punctuation marks at some places.	9.0	9.5
Student reads fluently but slowly, errors in pronunciation are few	22.0	36.5
While reading, student reads words haltingly and makes a few errors in pronunciation	26.7	37.1
Student reads haltingly, there are many errors in pronunciation, pays no attention to punctuation marks	20.9	15.6
Student cannot read	20.3	1.3

Very few students could read fluently with attention to punctuation marks; most of them paid no attention to punctuation marks. One- fifth of the students in Orissa could not read at all whereas such cases were very few in Uttar Pradesh.

(b) Word Reading

Students were asked to read words one by one from a list of 15 words. The words were of different complexity based on different combinations of syllables and variety in *matras*. Each student was tested individually and the scores were given on the spot. The words were shown to them one by one. The criteria for marking were correct pronunciation and fluency in reading.

Table 11: Skills of class V students in reading of words

Sl. No.	Words*	Orissa (N=1669)			Uttar Pradesh (N=1848)		
		(Dhenkanal & Kalahandi)			(Moradabad & Maharajganj)		
		Correct	Haltingly	Incorrect	Correct	Haltingly	Incorrect
1.	योगी	49.1	27.1	23.8	77.4	17.6	5.0
2.	कृपा	43.0	32.4	24.6	55.7	29.6	14.7
3.	विषय	39.5	30.9	29.7	77.3	17.3	5.4
4.	दुर्बल	33.3	32.3	34.5	40.1	40.7	19.2
5.	औषधि	37.6	31.0	31.4	33.4	43.8	22.8
6.	झाँकी	48.1	22.7	29.2	58.4	29.6	12.0
7.	खेत	27.5	22.5	50.0	31.0	45.2	23.8
8.	संपति	27.6	22.9	49.5	37.1	42.1	20.9
9.	प्रेरणा	18.2	32.9	48.9	23.5	41.2	35.2
10.	घनिष्ठ	24.6.	26.7	48.7	30.1	43.5	26.4
11.	सुशिक्षित	15.2	32.1	52.7	16.2	46.3	37.4
12.	वैज्ञानिक	27.9	24.9	47.2	54.6	30.4	15.0
13.	विश्राम	38.8	26.8	34.4	31.7	41.6	26.7
14.	विद्यालय	44.5	33.1	22.3	77.2	17.6	5.3
15.	बहुमूल्य	39.7	28.9	31.3	44.2	40.3	15.5

* The Oriya equivalents of these words are given in Annexure 1 .

Word no. 11 emerged as the most difficult word with more than 80% of students not being able to read it correctly. It was a compound word with two similar sounding letters of word following each other.

But out of the 15 words, 7 words were observed to be equally difficult to read in both states as these were read correctly by nearly same proportion of students in both of them. Of course, some words were more difficult to read in one state and less difficult in the other state.

(ii) **Writing skill**

The students were required to write a few sentences on what they saw in a picture being reproduced below.

Instructions: Look at the picture that is being shown. Write a few sentences about what you see in the picture. You can also make a story on it, if you like

They were encouraged to describe what they saw and also to make a story using their imagination. Evaluation of writing skill was done on the basis of criteria shown below. On each criterion, their writing was judged as 'satisfactory', 'average' or 'poor'.

Table 12: Basic Writing skill of class V students

Criteria	Orissa			Uttar Pradesh		
	Satisfactory	Avg	Poor	Satisfactory	Avg,	Poor
Legibility (Readable); Formation of letters including spacing and alignment *(MM=3)*	10.0	39.7	50.3	.05	63.0	37.0
No. of words / sentences written *(MM=3)*	1.3	17.6	81.1	1.6	63.0	35.4
Sentence construction (Grammar & Punctuation) *(MM=3)*	1.0	13.0	86.0	0.27	67.0	31.7
Spelling (Number of spelling errors in proportion to the matter written) *(MM=3)*	0.6	12.0	87.4	0.22	13.0	86.8
Sentence type used (simple and short, lengthy and complex); Connectedness of sentences; variety in the pattern of sentences *(MM=3)*	0.8	11.0	88.2	0.22	8.39	91.4
Content relevance & Coverage of items in the picture *(MM=3)*	0.9	9.6	89.5	-	0.86	99.1
Expression of ideas; Evidence of imagination. *(MM=2)*	2.9	9.3	87.8	-	0.86	99.1
Total *(MM=20)*	2.7	6.5	90.8	0.5	17.4	82.1

MM=Maximum marks

Overall the proportion of students with 'satisfactory' writing skill is very small in both states. The written material by students in Uttar Pradesh was scored high on legibility. They also used more words and sentences to express themselves. However, they made more errors in spelling and syntax and they were poor in expression of ideas, writing relevant sentences and coverage of items shown in the picture.

The writing skill of the students was poor in most cases in both the states as their scores were low on spelling, sentence type, connectedness of sentences, content relevance, coverage of items in the picture and expression of ideas. In Orissa, the overall performance was poorer than that in Uttar Pradesh.

The poor performance may be due to the fact that this exercise was a bit different from their normal school learning experiences. Children were not used to observing things with the intent to express their observations in writing. This may explain the low achievement on content relevance (appropriateness of what they wrote) and coverage of items in the picture. Obviously, the learning experiences provided to children are not adequate for developing their capacity to express themselves clearly, correctly and coherently.

4.6   Numeracy level of class IV/V students

As per National curriculum framework the teaching of mathematics should enhance children's ability to think and reason, to visualize and handle abstractions, to formulate and solve problems. There is no standard definition of Numeracy, in general it addresses the ability to effectively make use of number system (number, number operations, measurements, decimal and percentage etc).domains practiced in a society.

Development of numeracy skill was observed to be inadequate with more than half of the students scoring below 40% marks in the numeracy test in Karnataka (60.7%) and Orissa (53.7%). In Uttar Pradesh only 15% of the students scored below 40% marks.

Table 11 shows the percentage of students who had attained different levels of numeracy in the selected districts of the three states

Table 13: Percentage distribution of students of class IV in Karnataka and class V in Orissa and Uttar Pradesh by level of literacy/numeracy attained by them.

Frequency distribution	Karnataka (class IV students)		Orissa (class V Students)		Uttar Pradesh (class V students)	
	Bellary (477)	Mysore (479)	Dhenkenal (885)	Kalahandi (784)	Maharajganj (1036)	Moradabad (812)
	%	%	%	%	%	%
75% & above	23.41	12.5	23.4	6.6	16.60	21.06
60% to < 75%	15.61	12.3	15.7	9.3	33.30	38.18
50% to <60%	10.06	11.9	10.1	6.4	17.66	18.23
40% to <50%	10.18	8.6	10.2	9.3	15.93	9.24
Below 40%	40.72	54.7	40.7	68.4	16.51	13.30

Chart 22   Numeracy skills of students at terminal stage (Primary)
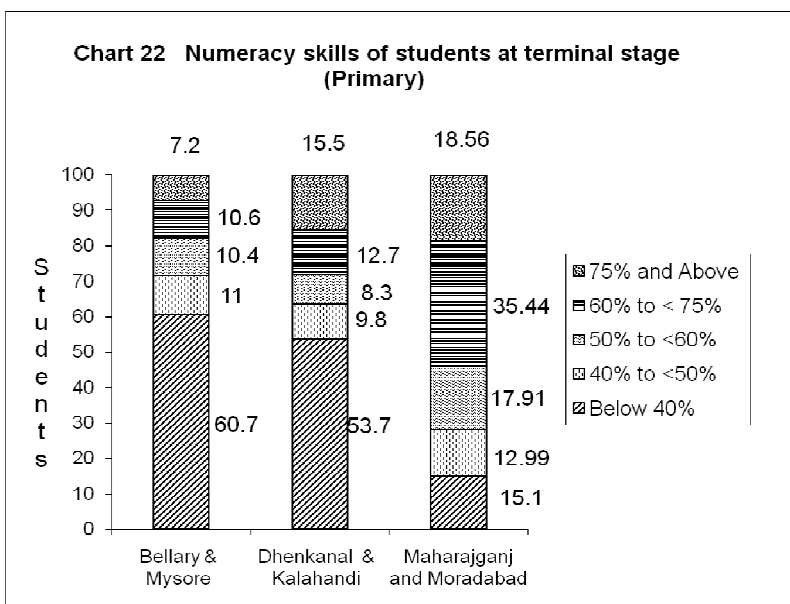
Development of Numeracy skill was observed to be inadequate in Karnataka and Orissa with more than half of the students scoring below 40 percent marks. In Karnataka, the low level of numeracy is partly due to the students who were tested being students of class IV whereas they were students of class V in the other two states. In Uttar Pradesh, more than half of the students scored 60% or more marks in the Numeracy test and only 15% scored below 40%.

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(iii)   Numeracy competencies

Table 14: Percentage of students who solved the given sums correctly

	Item No.	Orissa(n=1669) (Dhenkenal & Kalahandi)	Uttar Pradesh (n=1848) (Moradabad & Maharajganj)
1	Addition	78.26	90.5
2	Subtraction (with borrowing)	59.20	83.2
3	Multiplication	33.00	42.6
4	Multiplication (with carry over)	30.32	43.2
5	Division	39.55	55.2
6	Division (with remainder)	40.50	63.4
7	Time (problem sum)	13.91	17.9
8	Money (problem sum)	26.15	52.3
9	Measurement –length (problem sum)	29.04	60.9
10	Concept of fraction (1/4)	25.25	45.5
	Total	**37.52**	**55.47**
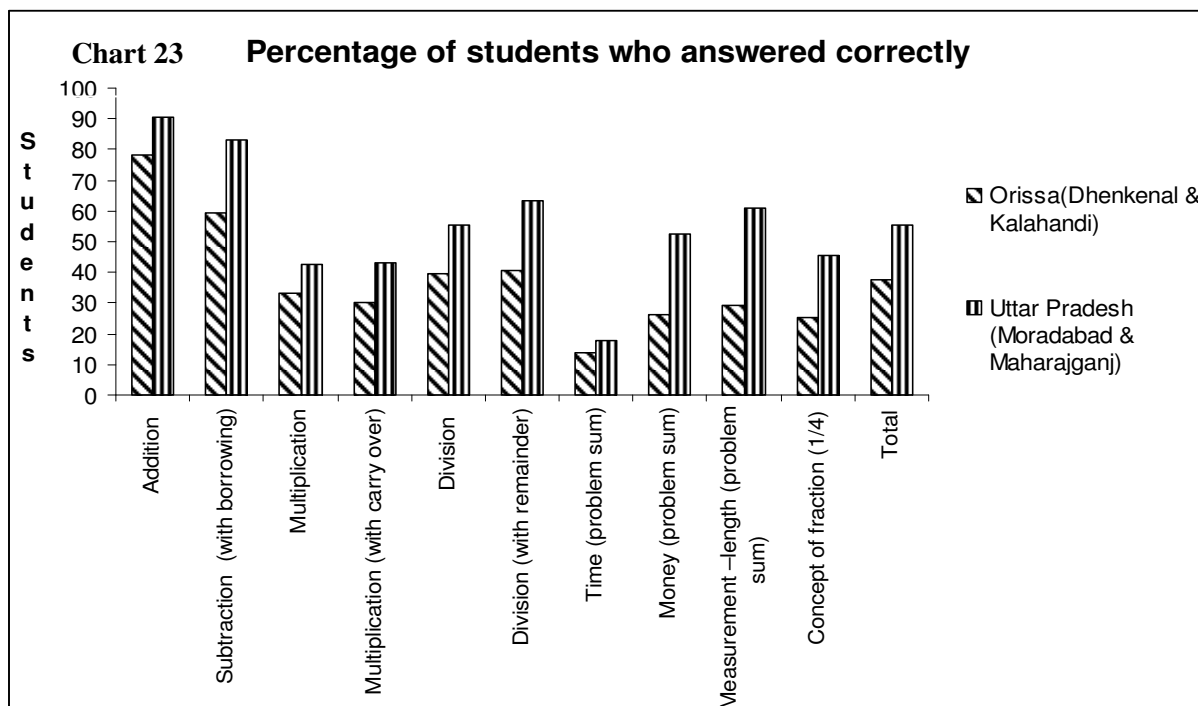
Overall, we may say that out of 10 questions, on the average the students were able to do about 4 sums correctly in Orissa and 6 correctly in Uttar Pradesh. Students had mastered the skill of addition in both states and of subtraction in only one state, namely, Uttar Pradesh. Performance of students on division sums was a slightly better than that on Multiplication sums. Performance on questions relating to `Time' was poor in both the states (less than 20%). The concept of fraction (1/4) as shown in a shaded figure was clear to more students in Uttar Pradesh than in

Orissa. Also on 'Money' and 'measurement' problems the students of Orissa performed poorly in comparison to those of Uttar Pradesh.

> It is a matter of concern if after four years of schooling, students do not get equipped with these basic numeracy skills which are so important in one's daily life

CHAPTER V

Conclusions & Suggestions

The present study was conducted in four states (Karnataka, Maharashtra, Orissa and Uttar Pradesh). In these states DPEP was implemented between 1997-98 and 2002-03 in a few selected districts.   In this report only the findings for Karnataka, Orissa and Uttar Pradesh are included. The results of the study in Maharashtra could not be included due to some flaws found in the data during data analysis.

The broad objectives of this study were i) to find out whether the schools have maintained or improved on their performance in respect of learning outcomes as measured by the achievement tests used in TAS for the penultimate grade of primary cycle ii) to find out to what extent students at the end of primary cycle have acquired the basic numeracy and literacy skills and iii) to study the contribution of school and home background factors to achievement of students. In this report only the first two objectives have been addressed.

For the first objective, students' achievement level was compared with the achievement level of students of the same grade in the same schools two years earlier when Terminal Assessment Survey (TAS) was conducted for DPEP. The same tests that were used in TAS were administered to the students in this study for checking whether the achievement level had remained the same or had improved or declined after a gap of 2 years since the completion of DPEP. For the second objective, in addition to the TAS tests, simple tests of reading and writing in language and doing simple arithmetic sums, were also administered to assess the literacy and numeracy level of the students.

The study was conducted in two districts which had medium achievement in TAS in each state. The findings reported here are for the three states: Orissa, Uttar Pradesh and Karnataka. The districts were Dhenkanal and Kalahandi in Orissa; Bellary and Mysore in Karnataka; and Maharajganj and Moradabad in Uttar Pradesh. Two States (Orissa and Uttar Pradesh) had primary cycle of 5 years whereas Karnataka had primary cycle of 4 years. The same fifty schools in which TAS was administered in these districts were chosen for testing the students. Students studying in the penultimate class of the primary cycle were tested.

Data on school infrastructure, teachers and home background of students was collected using questionnaires for schools, teachers and students. While TAS tests in language and Mathematics were used to assess students' achievement, the tests for measuring literacy and numeracy were developed specifically for this study. The tests had three components: Reading aloud, Writing skill and Reading Comprehension. Each component was given equal weightage.

The average achievement could be considered as satisfactory in Uttar Pradesh but quite poor in Karnataka and Orissa, the mean scores (average of two district) in language and mathematics respectively being 72.7 and 64.5 in Uttar Pradesh, 38.9 and 39.9 in Karnataka and 41.1 and 45.6 in Orissa. Comparison of mean scores (expressed as percentage of maximum marks) in

language and mathematics in TAS of 2003 was made with the mean scores of the presented Repeat Assessment Survey (RAS,2005) to see whether there was any significant increase or decrease in achievement level of students after two years since the cessation of DPEP.

State	District	Language			Mathematics		
		M*-TAS	M*-RAS	Diff.	M*-TAS	M*-RAS	Diff.
Karnataka	Bellary	40.6	31.9	-8.6	37.5	26.9	-10.6
	Mysore	40.3	26.3	-14.0	39.1	27.2	-11.9
Orissa	Dhenkenal	41.5	54.3	12.8	48.3	43.4	-4.9
	Kalahandi	40.6	45.3	4.7	41.9	33.9	-8.0
Uttar Pradesh	Maharajganj	71.9	57.7	-14.14	64.2	51.9	-12.3
	Moradabad	73.9	64.5	- 9.45	64.9	57.9	-7.0

M = Mean (%)

In Orissa, there was decrease in the mean score in Mathematics and an increase in mean score in language in both districts between TAS and the present the Repeat Assessment Survey (RAS). In Dhenkenal, the mean score declined from 48.3 in TAS to 43.4 in RAS in Mathematics and increased from 41.5 in TAS to 54.3 in RAS in Language. In Kalahandi, the mean score declined from 41.9 in TAS to 33.9 in RAS in mathematics and increased from 40.6 in TAS to 45.3 in RAS in language.

In Uttar Pradesh, in both the districts achievement scores showed decline in both subjects Language and Mathematics between TAS and RAS. In Maharajganj, the mean score declined from 64.2 in TAS to 51.9 in RAS in Mathematics and from 71.9 in TAS to 57.7 in RAS in Language. In Moradabad, the mean score declined from 64.9 in TAS to 57.9 in RAS in mathematics and from 73.9 in TAS to 64.5 in RAS in language.

 In Karnataka too, the achievement scores showed considerable decline. In mathematics, the mean score in TAS were 37.5 and 39.1 in Bellary and Mysore respectively which declined to 26.9 and 27.2 in the two districts in RAS-05. Similarly in language, achievement scores in TAS were 40.6 and 40.3 in Bellary and Mysore respectively which declined to 31.9 and 26.3 in the two districts in RAS-05.

Achievement in literacy tests indicate that around one fourth of the students in Karnataka (27.1%) and Orissa (27.6%) could be deemed as literate. In Uttar Pradesh, the picture was better with more than half (54.2%) of students being in this group. Very few students were found to be fully literate that is who scored 75% and above. Only 0.5% in Karnataka and Uttar Pradesh and 1.3% in Orissa scored over 75% marks in literacy test. In all the three states, students' achievement in reading comprehension was higher than that in reading aloud and writing. They could read silently and get gist of what was written but could not read aloud fluently and made errors in pronunciation of words.

Development of numeracy skill was observed to be inadequate with more than half of the students scoring below 40% marks in the numeracy test in Karnataka (60.7%) and Orissa

(53.7%). In Uttar Pradesh achievement was much better as only 15% of the students scored below 40% marks.

Results of the study raise concern about the learning experiences being provided to the children in schools. Overall low achievement of students in general and low achievement in basic literacy skills in particular, indicate that much more needs to be done to improve teaching learning in classrooms in order to equip children with basic knowledge along with understanding and application of knowledge, development of oral expression and writing skill.

In order to remedy the situation, it is important to review teachers training programme/s for primary teachers. Both pre-service and in-service training programmes need to be critically examined to prepare teachers for teaching in a manner that stimulate children's curiosity , make classroom learning attractive for children and eventually help in enhancing the achievement level of the children completing primary cycle and making them literate and numerate in true sense.

Word list used for assessing reading skills in Orissa

ଶବ୍ଦ ସୂଚୀ

୧. ଯୋଗୀ

୨. କୃପା

୩. ବିଶେଷ

୪. ଦୁର୍ବଳ

୫. ଔଷଧ

୬. ଝିଙ୍କ

୭. ଶ୍ୱେତ

୮. ସମ୍ପଦ

୯. ପ୍ରେରଣା

୧୦. ଘନିଷ୍ଠ

୧୧. ସୁଶିକ୍ଷିତ

୧୨. ବୈଜ୍ଞାନିକ

୧୩. ବିଶ୍ରାମ

୧୪. ବିଦ୍ୟାଳୟ

୧୫. ବହୁମୂଲ୍ୟ

Subject: Mathematics **, Number of Items**: 40
State: Orissa and Uttar Pradesh
Number Students Tested: Orissa- 1669, Uttar Pradesh-1848
Mean Score and SD of the Test: Orissa- 15.56 &7.8 ; Uttar Pradesh-21.8& 5.1
Reliability (Cronback Alfa): Orissa- 879, Uttar Pradesh-0.67

	Orissa				**Uttar Pradesh**			
Item No	**Facility value**	***DI**	**$ Average Achievement**	**Point Biserial**	**Facility Value**	***DI**	**$ Average Achievement**	**Point Biserial**
m1	81.786	0.348	16.76	0.3264	94.859	0.067	21.93	0.1011
m2	56.860	0.412	17.88	0.3419	50.595	0.220	22.76	0.1899
m3	54.284	0.639	18.99	0.4798	75.487	0.353	22.64	0.2877
m4	46.075	0.559	19.45	0.4616	65.855	0.430	23.01	0.3293
m5	69.802	0.384	17.29	0.3376	84.199	0.228	22.29	0.2187
m6	51.228	0.534	18.84	0.4315	58.496	0.408	23.07	0.2956
m7	36.010	0.514	20.29	0.4555	53.950	0.424	23.13	0.2824
m8	35.470	0.224	17.74	0.2075	53.139	0.392	23.28	0.3094
m9	42.301	0.373	18.51	0.3242	80.574	0.335	22.54	0.2936
m10	63.331	0.621	18.49	0.4943	82.035	0.319	22.52	0.2997
m11	39.425	0.463	19.16	0.3728	42.911	0.310	23.24	0.2450
m12	55.662	0.634	18.95	0.4876	71.753	0.322	22.64	0.2613
m13	45.416	0.576	19.66	0.4801	71.753	0.353	22.68	0.2739
m14	26.123	0.412	15.56	0.0000	39.610	0.539	24.33	0.4035
m15	45.896	0.514	18.99	0.4055	63.366	0.339	22.77	0.2495
m16	37.268	0.510	19.70	0.4096	63.041	0.344	22.87	0.2736
m17	31.935	0.510	20.97	0.4757	42.478	0.306	23.26	0.2463
m18	46.195	0.603	19.74	0.4972	72.078	0.295	22.53	0.2285
m19	43.080	0.621	19.95	0.4903	51.732	0.426	23.35	0.3151
m20	36.369	0.636	20.71	0.4998	50.379	0.479	23.66	0.3685
m21	24.506	0.339	20.25	0.3430	41.180	0.288	23.07	0.2084
m22	19.173	0.220	19.17	0.2257	41.883	0.202	22.75	0.1577
m23	50.449	0.667	19.47	0.5065	73.160	0.348	22.66	0.2772
m24	51.768	0.639	19.30	0.4974	81.277	0.120	22.16	0.1438
m25	37.268	0.627	20.73	0.5115	54.113	0.525	23.61	0.3864
m26	35.351	0.386	19.44	0.3683	42.424	0.304	23.22	0.2392
m27	20.791	0.304	21.07	0.3624	36.634	0.290	23.35	0.2314
m28	27.861	0.472	21.13	0.4444	37.554	0.399	23.83	0.3097
m29	15.458	0.182	20.04	0.2459	33.117	0.483	24.63	0.3923
m30	27.382	0.379	20.29	0.3728	36.688	0.417	23.88	0.3115
m31	26.603	0.517	22.18	0.5116	39.827	0.319	23.28	0.2364
m32	33.074	0.561	20.38	0.4350	43.994	0.348	23.27	0.2558
m33	23.607	0.339	20.85	0.3775	27.110	0.235	23.47	0.2001
m34	45.237	0.674	20.26	0.5484	33.983	0.191	22.98	0.1659
m35	32.534	0.481	20.52	0.4422	59.416	0.408	23.04	0.2941
m36	43.679	0.588	19.78	0.4771	60.552	0.395	23.11	0.3183
m37	26.123	0.519	22.22	0.5084	40.747	0.348	23.50	0.2770
m38	27.561	0.479	21.29	0.4537	48.810	0.346	23.13	0.2547
m39	26.303	0.239	19.31	0.2876	47.348	0.395	23.39	0.2962
m40	16.657	0.222	20.06	0.2582	33.009	0.386	23.94	0.2956
Average	**38.898**				**54.528**			

*DI - DISCRIMINATION INDEX
$ Average achievement - MEAN OF STUDENTS WITH CORRECT RESPONSE

Subject: Word Knowledge, **Number of Items**: 35
State: Orissa and Uttar Pradesh
Number Students Tested: Orissa- 1669, Uttar Pradesh-1848
Mean Score and SD of the Test: Orissa- 19.59 &7.14; Uttar Pradesh-21.7 & 4.28
Reliability (Cronback Alfa): Orissa- 859, Uttar Pradesh-0.492

Item no	Orissa				Uttar Pradesh			
	Facility value	*DI	$Average Achievement	Point biserial	Facility value	*DI	$AVERAGE ACHIEVMENT	Point Biserial
W1	75.974	0.268	20.67	0.2690	89.502	0.093	21.87	0.1146
W2	73.637	0.483	21.48	0.4424	74.459	0.304	22.29	0.2346
W3	60.096	0.521	22.14	0.4383	63.690	0.428	22.68	0.3027
W4	64.649	0.596	22.19	0.4924	73.810	0.304	22.40	0.2738
W5	56.501	0.616	22.74	0.5028	62.825	0.455	22.83	0.3427
W6	57.100	0.619	22.71	0.5041	72.457	0.348	22.44	0.2797
W7	66.147	0.603	22.15	0.5012	64.773	0.499	22.89	0.3765
W8	61.354	0.557	22.25	0.4694	64.177	0.368	22.58	0.2746
W9	57.879	0.532	22.17	0.4236	53.247	0.441	23.01	0.3262
W10	42.421	0.290	21.85	0.2717	55.303	0.273	22.48	0.2022
W11	60.635	0.470	21.88	0.3981	63.636	0.169	22.11	0.1261
W12	48.352	0.455	22.55	0.4011	57.305	0.200	22.31	0.1646
W13	55.662	0.443	21.92	0.3656	64.502	0.071	21.98	0.0876
W14	59.377	0.621	22.36	0.4690	61.310	0.277	22.42	0.2112
W15	44.877	0.353	21.97	0.3008	52.381	0.517	23.25	0.3794
W16	56.681	0.503	22.09	0.4005	66.775	0.346	22.55	0.2809
W17	55.003	0.552	22.45	0.4429	56.061	0.550	23.25	0.4086
W18	63.811	0.592	22.31	0.5059	66.288	0.381	22.54	0.2746
W19	57.280	0.623	22.64	0.4946	62.554	0.521	22.92	0.3679
W20	55.902	0.636	22.80	0.5062	63.203	0.366	22.57	0.2659
W21	60.096	0.375	21.50	0.3283	72.835	0.317	22.38	0.2595
W22	49.251	0.459	22.29	0.3725	55.032	0.375	22.85	0.2968
W23	55.123	0.479	22.28	0.4175	53.842	0.368	22.84	0.2872
W24	58.658	0.537	22.29	0.4504	64.502	0.284	22.45	0.2356
W25	51.768	0.435	22.06	0.3584	56.602	0.186	22.22	0.1383
W26	57.400	0.647	22.80	0.5219	55.790	0.432	22.95	0.3276
W27	55.063	0.517	22.25	0.4124	62.987	0.322	22.54	0.2555
W28	44.578	0.233	21.65	0.2588	63.853	0.399	22.69	0.3069
W29	52.487	0.441	22.00	0.3548	47.781	0.186	22.44	0.1650
W30	46.016	0.443	22.51	0.3776	56.926	0.412	22.88	0.3165
W31	47.394	0.419	22.31	0.3616	61.797	0.302	22.45	0.2223
W32	47.633	0.508	22.67	0.4114	52.002	0.286	22.69	0.2403
W33	45.237	0.530	22.84	0.4137	58.063	0.166	22.24	0.1479
W34	57.519	0.643	22.58	0.4873	62.662	0.195	22.25	0.1659
W35	56.561	0.525	22.18	0.4139	57.251	0.277	22.47	0.2077
Average	**55.946**				**62.005**			

*DI - DISCRIMINATION INDEX
$ Average achievement - MEAN OF STUDENTS WITH CORRECT RESPONSE

Subject: Reading Comprehension, **Number of Items**: 35
State: Orissa and Uttar Pradesh
Number Students Tested: Orissa- 1669, Uttar Pradesh-1848
Mean Score and SD of the Test: Orissa- 15.43 & 7.22; Uttar Pradesh-20.77& 5.11
Reliability (Cronback Alfa): Orissa- 0.867, Uttar Pradesh-0.717

ITEM NO	Orissa				Uttar Pradesh			
	FACILITY VALUE	*DI	$Average Achievement	POINT BISERIAL	FACILITY VALUE	*DI	$Average Achievement	POINT BISERIAL
R1	70.042	0.297	16.67	0.2613	90.043	0.104	20.98	0.1234
R2	66.327	0.466	17.34	0.3700	78.139	0.208	21.25	0.1774
R3	52.846	0.506	18.25	0.4124	61.310	0.490	22.23	0.3592
R4	35.111	0.390	18.85	0.3476	49.567	0.426	22.43	0.3217
R5	50.989	0.519	18.26	0.3988	61.093	0.443	22.21	0.3527
R6	38.886	0.357	18.17	0.3019	48.701	0.397	22.32	0.2952
R7	36.189	0.392	18.86	0.3569	45.076	0.344	22.30	0.2709
R8	40.683	0.521	18.43	0.3433	70.292	0.401	21.74	0.2916
R9	63.032	0.550	17.87	0.4400	73.810	0.421	21.79	0.3347
R10	60.156	0.548	17.98	0.4328	67.045	0.395	21.83	0.2955
R11	32.055	0.239	17.56	0.2020	58.442	0.421	22.13	0.3152
R12	42.840	0.426	18.16	0.3265	60.119	0.379	22.03	0.3024
R13	53.445	0.559	18.50	0.4545	69.589	0.481	22.06	0.3814
R14	36.609	0.472	19.29	0.4054	45.833	0.461	22.69	0.3452
R15	31.875	0.554	20.59	0.4880	51.245	0.472	22.53	0.3527
R16	34.332	0.634	20.61	0.5178	54.924	0.510	22.52	0.3776
R17	38.286	0.472	19.17	0.4071	47.890	0.428	22.39	0.3036
R18	31.216	0.377	19.07	0.3389	43.074	0.439	22.66	0.3214
R19	55.003	0.747	19.28	0.5883	74.892	0.399	21.80	0.3477
R20	50.090	0.743	19.67	0.5871	67.911	0.399	21.90	0.3213
R21	49.011	0.687	19.51	0.5529	69.426	0.512	22.12	0.3976
R22	48.892	0.690	19.66	0.5719	61.472	0.514	22.31	0.3802
R23	54.883	0.468	18.13	0.4113	34.416	0.330	22.67	0.2690
R24	44.817	0.636	19.48	0.5045	60.823	0.550	22.44	0.4067
R25	59.257	0.692	18.69	0.5432	76.299	0.439	21.82	0.3682
R26	24.086	0.266	19.25	0.2974	50.487	0.497	22.57	0.3553
R27	41.941	0.690	20.08	0.5464	65.314	0.461	22.07	0.3487
R28	35.770	0.490	19.54	0.4239	48.052	0.350	22.14	0.2575
R29	38.167	0.517	19.47	0.4387	52.868	0.257	21.68	0.1884
R30	44.757	0.501	18.92	0.4341	74.729	0.297	21.57	0.2689
R31	36.309	0.610	20.33	0.5115	50.271	0.341	22.03	0.2476
R32	40.084	0.621	19.78	0.4918	55.790	0.435	22.18	0.3096
R33	33.613	0.357	18.91	0.3422	54.329	0.355	22.00	0.2622
R34	33.253	0.424	19.52	0.3990	54.708	0.377	22.15	0.2965
R35	38.526	0.373	18.27	0.3106	49.026	0.213	21.60	0.1591
AVERAGE	44.097				59.343			

*DI - DISCRIMINATION INDEX
$ Average achievement - MEAN OF STUDENTS WITH CORRECT RESPONSE