



EVALUATION OF AKSHARA FOUNDATION STRATEGIES IN TEACHING MATHEMATICS AT PRIMARY SCHOOLS

Report of the Three Year Longitudinal Study

Sponsored by

Akshara Foundation, Bangalore

By

Vinod B. Annigeri

Arunkumar R. Kulkarni

Dattatreya R. Revankar



CENTRE FOR MULTI-DICIPLINARY DEVELOPMENT RESEARCH

Dr. B R Ambedkar Nagar, Near Yalacki Shetter Colony,

Dharwad – 580004

www.cmdr.ac.in

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Submitted to

**Akshara Foundation
Bangaluru**



CENTRE FOR MULTI-DISCIPLINARY DEVELOPMENT RESEARCH (CMDR)
Dr.B.R.Ambedkar Nagar, Near Yalakki Shettar Colony, Dharwad – 580004
(KARNATAKA STATE)

Tel: 0836(+) 2460453, 2460472 Fax : +2460464

Web : www.cmdr.ac.in

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ACKNOWLEDGEMENT

School performance has a bearing on the learning levels of students. This is more so in public schools which deserve immediate attention. Many studies have documented the fact that the learning skills need improvement in public schools especially with regard to Mathematics and English at the primary level. Akshara Foundation has embarked on a very interesting and challenging project to bring in improvements in learning skills of students in Mathematics and English. It has been trying to bring this change via its very innovative and child friendly teaching methods. The experiment is carried out in select schools of Gadag and Koppal districts of North Karnataka.

The task of evaluating this experiment was entrusted to Center for Multi-disciplinary Development Research (CMDR) Dharwad. At the outset CMDR sincerely thanks Akshara Foundation for providing this opportunity.

The study team sincerely thanks all those who helped us in completing this task. Mr. Ashok Kamat, Chairman and Ms. Kanchan Bannerjee, Managing Trustee of Akshara Foundation did visit CMDR and provided critical inputs to the study team. They deserve our sincere thanks. Mrs. K. Vaijayanti, Head for Research, Resource & Evaluation wing of Akshara Foundation, supported us all throughout in carrying out this study effectively and we are falling short of words to thank her in this regard.

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Study team received very good support and co-operation from the teachers of both Akshara and Non Akshara Schools who deserve our sincere thanks. The team of investigators who remained with us for three years played a crucial role in collecting the necessary data from the field. We have full appreciation of their support and sincerely thank them.

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The study team also thanks the other committed band of people at CMDR for the effective completion of this study.

17.2.2016

Prof.V.B.Annigeri
Director, CMDR

EXECUTIVE SUMMARY

Akshara Foundation has a novel mission to ensure that **'every child is in school and learning well'**. Established in the year 2000, Akshara Foundation has a range of programmes that provide multiple solutions for universalizing elementary education.

In the interest of reaching out to the vast number of students in Government schools, Akshara has consciously adopted the approach of comprehensive, scalable, replicable and cost-effective education solutions. Akshara works in Bangaluru, and many other parts of Karnataka through its close partnership with the State Education Department and Government school administration, in areas of basic literacy and numeracy. The interventions are designed based on the "ground level" insights that have been acquired by working for over a decade with the elementary education sector in Karnataka.

Ever since it was decided in 2007 to introduce English from 1ststd in

Government schools in Karnataka, there has been an acute need for appropriate material for both Teachers and pupil. While the NCF stipulates what is age-appropriate learning content for children, it is also essential to ensure that the content is within the grasp of the teacher in our system today. In this background Akshara Foundation (AF) visualized an innovative program of teaching English and Mathematics at primary schools. The tools so developed are teacher and student friendly. After an encouraging experiment at Hoskote, AF is trying to bring this idea to northern districts in the state namely Koppal and Gadag.

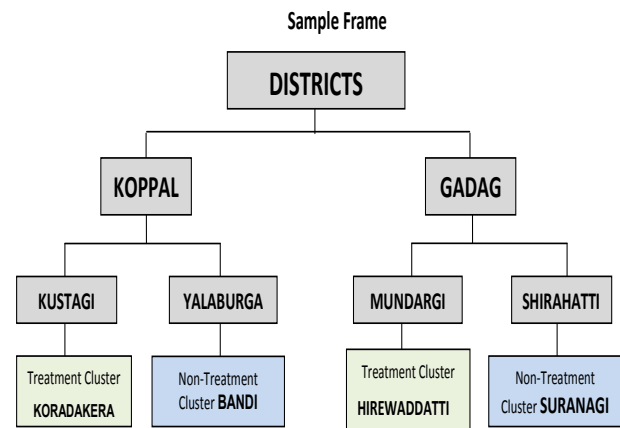
Akshara Foundation's objective is to demonstrate the efficacy of these interventions in pilot implementation usually covering entire block or at times even a complete district to demonstrate scale related aspects. Akshara Foundation's vision is to implement the NCF 2005 goals of teaching English in classes I- IV at government primary schools in Karnataka.

Center for Multi-disciplinary Development Research (CMDR) Dharwad took up the evaluation of Akshara intervention to examine the impact of the program on the learning levels of the students and also the improvement in their skills. Along with such outcome measures it is also required to study the process indicators that have a bearing on the impact of the program.

CMDR examined the effect of the Akshara intervention in both Akshara (treatment) schools and Non Akshara (non-treatment) schools over a period of three years (2012-13 to 2014-15). For each year data was collected in two phases. The first phase was during the beginning of the academic year and the second phase was just before the close of the academic year. Thus, it is a longitudinal study which focused on the same students over the whole period of time. By comparing the test scores of Akshara and Non-Akshara schools one can try to capture the effect of the program on the student community.

In a way such comparison between Akshara and Non-Akshara schools will yield the effect of the Akshara program which

would consist of teacher training, usage of manual and usage of kit, classroom strategy leading to universal understanding of basic Mathematics concepts. The following diagram shows sample frame of the study.



MAJOR FINDINGS:

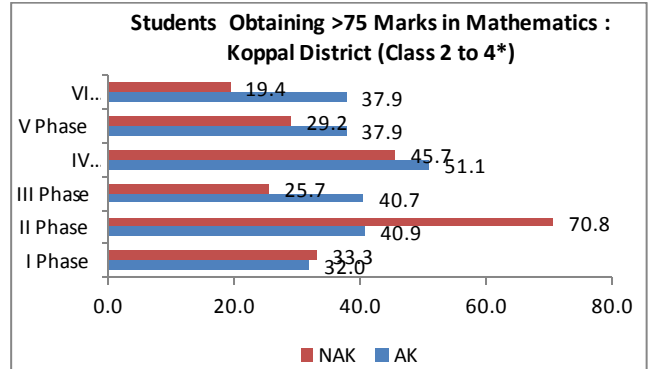
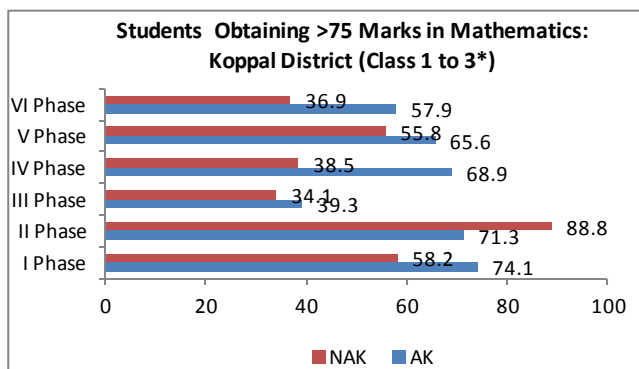
Tests were conducted in Mathematics for the students of both Akshara and Non Akshara schools to understand the impact of Akshara initiatives. Tests were administered to understand the learning abilities of these students.

Akshara initiative has made a positive impact on the classroom transactions and hence on the performance of students as well. Akshara students are doing well in Mathematics as compared to the Non Akshara students in the districts. **The fact**

that greater proportion of Akshara students were found in > 75 percentage brackets in all the three years of intervention itself is a proof that the students have been benefitted by the Akshara initiative. Keeping aside certain factors which are beyond the control of any initiative like Educational background of parents, Socio-economic status of the

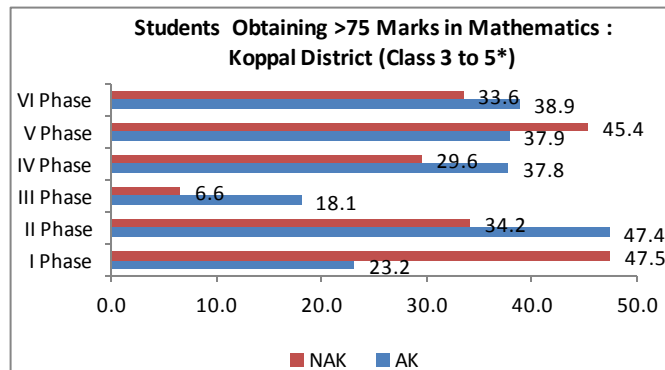
students, the Akshara initiative has made significant impact on the learning levels of the students. The following diagrams depict this picture in greater detail. One can find better performance of Non Akshara schools in some phases and it is quite obvious that such results do occur in any field investigation.

Koppal District



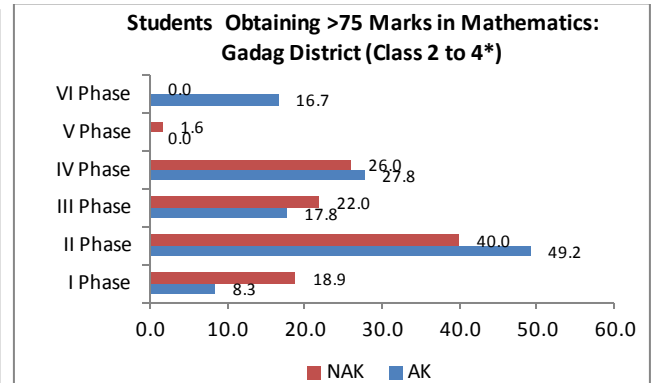
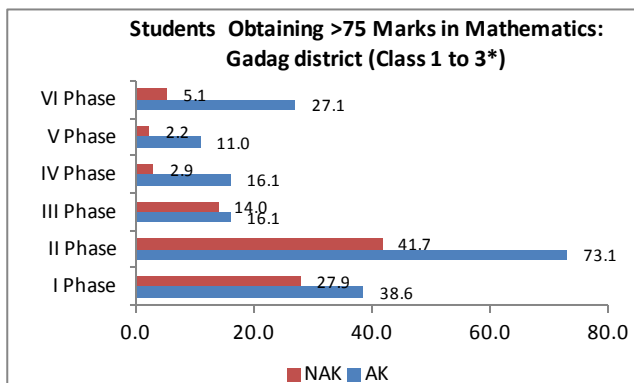
*Class 1 = Phase I & II, Class 2 = Phase III & IV, Class 3 = Phase V & VI

*Class 2 = Phase I & II, Class 3 = Phase III & IV, Class 4 = Phase V & VI

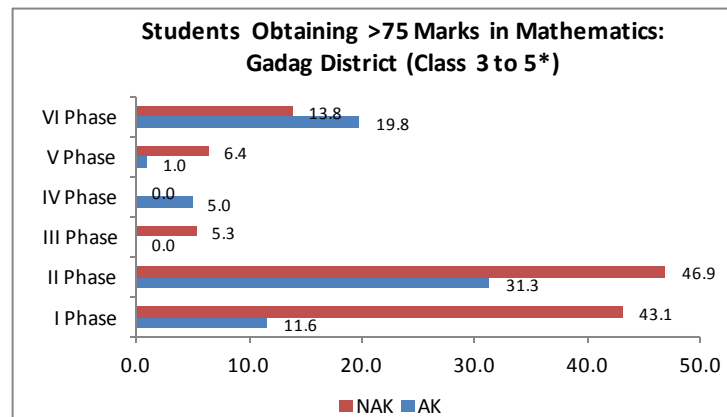


*Class 3 = Phase I & II, Class 4 = Phase III & IV, Class 5 = Phase V & VI

Gadag District



*Class 1 = Phase I & II, Class 2 = Phase III & IV, Class 3 = Phase V & VI *Class 2 = Phase I & II, Class 3 = Phase III & IV, Class 4 = Phase V & VI



*Class 3 = Phase I & II, Class 4 = Phase III & IV, Class 5 = Phase V & VI

STUDENTS' PERFORMANCE: VIEW FROM ECONOMETRIC ANALYSIS:

- ❖ Irrespective of standard, location, or class, students who secured higher percentage marks in phase 1 or phase 3 or phase 5, their gain is statistically lower than that of students who secured lower marks in subsequent phase.

- ❖ In phases 1 and 2, intervention in mathematics benefited students in standard 3 in Koppal district, whereas students in 4th and 5th standard benefited in Gadag.
- ❖ For 3rd and 4th phase, for standard 1 and standard 2 students – in Koppal – Akshara students have done statistically better for Mathematics intervention. For standard 3 and 4

students – there is no statistically different impact of intervention in both the districts.

- ❖ In 5th and 6th phases Akshara intervention yielded higher results in most cases except for Standard 3 students in Koppal with or without controls for Mathematics in Koppal or Gadag. Results were statistically significant.

Based on our field experiences and our analysis of the cohort data we would like to place the following suggestions for the Akshara initiative.

FEW OBSERVATIONS:

In sum, if one looks at the Akshara intervention in both the districts, the news seems to be good and encouraging. For example both input and outcome indicators due to such intervention have improved in Akshara schools as compared to the Non Akshara schools. The indicators of Classroom transactions as well as Classroom observations have been better in Akshara schools and they have also improved as the intervention has progressed. Such improvement has its impact on the learning skills of the students which is exhibited by

the performance of Akshara students in Mathematics tests which were administered to both Akshara and Non Akshara schools. Out of the total six phases spread over three years, one can observe that by and large Akshara students have performed better than Non Akshara students. This only brings home the fact that Akshara intervention has served the purpose for which it was initiated. This also supports the argument of scaling up such intervention in other parts of the state.

RECOMMENDATIONS:

The study team would like to make the following recommendations which would go a long way in further fine tuning the intervention for the benefit of the student community.

- ❖ The issue of teacher transfer who are trained by the Akshara initiative has sometimes created irritants in the effective implementation of the initiative. The trained teachers need to be retained in the same place till the intervention is in progress.
- ❖ Another issue with regard to teacher training is that all the teachers in the

- same school need to be trained by Akshara. Now those who are not trained feel that they have been neglected by this kind of intervention. Time schedule of training and supply of kits need to be in accordance with the academic calendar of schools.
- ❖ The need is also felt to train BRPs and CRPs for effective monitoring of the program. SDMC members also need to be sensitized with regard to such intervention.
 - ❖ Usually such interventions would lose the steam as soon as the intervening agency withdraws from the scene. Thus, in-order to sustain
 - ❖ the initiative even after the exogenous factor withdraws; the need is felt with regard to use the trained teachers as trainers for training the other teachers. This would help the program to get internalized in the public schooling system.
 - ❖ Now the intervention of the Akshara initiative is trying to make a dent into the public education system at the school level. The need is felt in this regard from the Education Department to own this initiative which would give greater mileage to the efforts put in.

CHAPTER 1 INTRODUCTION

1.1 SCHOOL EFFECTIVENESS AND THE AKSHARA INITIATIVE:

Akshara Foundation is a Bangalore-based Public Charitable Trust with a mission to ensure that **'every child is in school and learning well'**. Established in the year 2000, Akshara Foundation has a range of programmes that provide multiple solutions for universalizing elementary education.

In the interest of reaching out to the vast number of students in Government schools, Akshara has consciously adopted the approach of comprehensive, scalable, replicable and cost-effective education solutions. Akshara works in Bangaluru, and many other parts of Karnataka through its close partnership with the State Education Department and Government school administration, in areas of basic literacy and numeracy. The interventions are designed based on the "ground level" insights that have been acquired by working for over a decade with the elementary education sector in Karnataka.

Ever since it was decided in 2007 to introduce English from 1ststd in Government schools in Karnataka, there has been an acute need for appropriate material for both Teachers and pupils. While the NCF stipulates what is age-appropriate learning content for children, it is also essential to ensure that the content is within the grasp of the teacher in our system today. In this background Akshara Foundation (AF) visualized an innovative program of teaching English and Mathematics at primary schools. The tools so developed seem to be both teacher and student friendly. After an encouraging experiment at Hoskote, AF is trying to bring this idea to northern districts in the state namely Koppal and Gadag.

Akshara Foundation's objective is to demonstrate the efficacy of these interventions in pilot implementation usually covering entire block or at times even a complete district to demonstrate scale related aspects.

Akshara Foundation's vision is to implement the NCF 2005 goals of teaching English in classes I- IV in government primary schools in Karnataka. In the same fashion Akshara also tries to teach Mathematics to the students of primary schools by providing a systems approach to teaching the two subjects.

In this background it would be useful to initiate an evaluation of the program before it is launched on a large scale to take stock of the situation at the ground level. Therefore, on the request of the Akshara Foundation, CMDR has undertaken to determine the impact of the program on the learning levels of the students and also the improvement in their skills. Along with such outcome measures it is also required to study the process indicators that have a bearing on the impact of the program. For example, the class room transactions, the way the inputs reach the schools, design and content of the inputs, training of the teachers and feedback from stake holders.

1.2 EVALUATION OF AKSHARA INITIATIVE BY CMDR

CMDR examined the effect of the Akshara intervention in both Akshara

(treatment) schools and Non Akshara (non-treatment) schools over a period of three years. For every year data was collected in two phases. The first phase was during the beginning of the academic year and the second phase was just before the close of the academic year. Thus, it is a longitudinal study which would focus on the same students over the whole period of time. By comparing the test scores of the Akshara and Non-Akshara schools one can try to capture the effect of the program on the student community. In a way such comparison between Akshara and Non-Akshara schools will yield the effect of the Akshara program which would consist of teacher training, usage of manual, and usage of kit, classroom strategy leading to universal understanding of basic Mathematics concepts as well as basic spoken English skills.

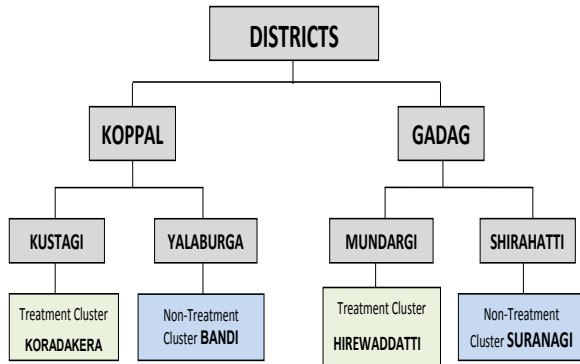
The overall focus of the study considered the Akshara Foundation's Program across the components specified below in both Akshara and Non-Akshara schools:

1. Classroom processes
2. Learning outcomes
3. Teacher and student Perceptions

1.3 SAMPLE FRAME FOR THE STUDY

Gadag and Koppal districts have been chosen for the study. Within these districts, two blocks have been identified which were classified as backward as per the D.M Nanjundappa Committee report. Each cluster within the selected block is identified as one belonging to the intervention category and the other one as belonging to the non intervention category. Following chart would explain the selection of the sample units for the study.

Chart 1.1: Sample Frame of the Study



In the district of Gadag two blocks namely Mundargi and Shirahatti were surveyed. In Mundargi block Hirewatti cluster is the Akshara strategy unit with 9 schools. In Shirahatti which is the Non-Akshara block, Surangi is the cluster with 9 schools. Similarly in Koppal district Koradekera is the Akshara strategy unit with 14 schools and Bandi is the Non-Akshara cluster in Yelburga block with 13 schools. The following table would give the number of schools that formed the sample frame for the study. The study focused on Kannada medium schools.

Table 1.1: Sample Schools in Gadag District

Block: Mundargi		Block: Shirahatti	
Cluster: Hirewaddatti		Cluster: Suranagi	
Treatment Schools		Non Treatment Schools	
Village	School Name	Village	School Name
Kelur	GHPS Kelur	Nelogal	GLPS Nelogal
Tambragundi	GHPS Tambragundi	Balehosur	GHPS Balehosur
Hirewaddatti	GMCS Hirewaddatti	Suvarnagiri	GLPS Suvarnagiri
Budihal	GHPS Budihal	Suranagi	GLPS Suranagi Tanda 2
Hirewaddatti	GHPGS Hirewaddatti	Suranagi	GHPGS Suranagi
Hirewaddatti	GLPS Hirewaddatti	Suranagi	GLPS Suranagi (Janata Plot)
Harogeri	GHPS Harogeri	Suranagi	GHPS Suranagi
Harogeri	GLPGS Harogeri	Balehosur	GLPS Balehosur (Kanakadas)
Basapur	GHPS Basapur	Balehosur	GLPGS Balehosur

Table 1.2: Sample Schools in Koppal District

Block: Kushtagi Block		Block: Yelburga	
Cluster: Koradakera		Cluster: Bandi	
Treatment Schools		Non Treatment Schools	
Village	School Name	Village	School Name
Benchamatti	GLPS Benchamatti	Chikkoppa	GHPS Chikkoppa
Madalagatti	GLPS Madalagatta	Ballutagi	GLPS Girls Ballutagi
Hirebannigol	GHPS Hirebannigol	Chikkoppa	GLPS Chikkoppa Tanda
Koradkera	GCHPS Koradakeri	Ballutagi	GLPS Balutagi Tanda
Yeleburchi	GHPS Yalaburchi	Ballutagi	GHPS Balutagi
Chikkanandihal	GLPS Chikka Nandihal	Hagedal	GLPS Hagedhal
Shakapur	GHPS Shakapur	Kadabalakatti	GLPS Kadabalakatti
Hirebannigol	GLPS SC Colony Hirebannigol	Boonkoppa	GLPS Bunakoppa
Bisnhal	GLPS Bisnhal	Tummaraguddi	GHPS Tummaraguddi
Donnegudda	GLPS Donnigudda	Bandi	GHPS Bandi
Hirenandihal	GHPS Hirenandihal	Julakatti	GHPS Julakatti
Parasapur	GLPS Parasapur	Bassapur	GHPS Bassapur
Byalihal	GHPS Byalihal	Bandi	GLPS Girls Bandi
Kanakoppa	GHPS Kanakoppa		

The pre and post intervention survey was carried over the period of three years to examine the cumulative impact of the program on students' performance. The same students were surveyed in all the three years as indicated in the table below.

Table 1.3: Cohort Pattern of the Survey

Survey Schedule	Classes Surveyed				
Year 1	Class 1	Class 2	Class 3	Class 4	Class 5
Year 2		Class 2	Class 3	Class 4	Class 5
Year 3			Class 3	Class 4	Class 5

Instrumentation

The data for the evaluation was obtained from different stakeholders, and accordingly the study team developed different field survey instruments as indicated below.

1. School Schedule
2. Classroom Observation Schedule
3. Teachers' Schedule
4. Students' Schedule

For assessing the skills / competencies of the students, Mathematics

tests were conducted for 1st to 5th standard students.

These instruments were initially tested in the Hoskote study and modifications based on the feedback were obtained. Further all the instruments were scrutinized by a committee consisting of experienced researchers and practitioners. Hence all the instruments have content validity.

Procedure of Data Collection

The AF personnel conducted a training program for teachers in the sample with two objectives:-

1. To improve teachers' subject matter competency and
2. To train them in using AF's teaching learning material and teaching strategies.

Design of Akshara Teacher training:

On the basis of inputs from teachers, observations of classroom practices, study of various State text-books as well as the NCF guidelines, Akshara has designed a training package, keeping in mind the capacity of the average teacher in a Government school at the primary level.

Critical Inputs of the AF Experiment:

- A) Capacity building for teachers of std 1-5, in Mathematics
- B) Creating course-content which is appropriate at the ground level, by

making learning fun and relevant to everyday life and is taught based on the Philosophy of Activity based learning.

Table 1.4: Inputs of the AF Experiment

Capacity-building for Teachers	TLM	Course content for Classes I, II, III , IV & V
A five-day teacher training programme in the beginning of the academic year, followed by a two day brush-up session in December	The objectives spelt out in the NCERT Position Paper have been taken as the guidelines in designing the TLM content	Participatory approach has been followed to make best use of the resources. Simple and student friendly tools have been designed to teach Mathematics

A host of innovative methods have been introduced keeping in mind the context specific environment that exists in the rural government schools. In this background an evaluation of such an initiative would be useful for pushing further the simplistic way of teaching Mathematics at the primary level.

Class Room Observations:

Classroom Observations were conducted along with the test score Assessments. As Nali Kali is operating at the primary levels, the class room observations were conducted as indicated below.

Table 1.5: Class Room Observation Details

Observation of Class Room Transactions	Number of Class Rooms per School
Mathematics	One Nali Kali Class Room (1 st std to 3 rd std) One Class Room of Standard 4 One Class Room of Standard 5

The following tables present the scenario of selected schools in Koppal and Gadag districts. Tables below show Taluks covered for the study, number of Akshara

and Non-Akshara schools, students and teachers in such schools and period of data collection.

Table 1.6: Resume of the Survey-Koppal District

Details	Type	First Year	Second Year	Third Year
Taluks	Akshara	Kushtagi		
	Non Akshara	Yelburga		
No. of Schools	Akshara	14	14	14
	Non Akshara	13	13	13
No. of Students	Akshara	808	765	558
	Non Akshara	670	654	506
No. of Teachers	Akshara	40	44	36
	Non Akshara	35	36	33
Period of Data Collection		August - September - 2012 and Feb. – March 2013	August 2013 and January 2014	June-July 2014 and January-February, 2015

Table 1.7: Resume of the Survey- Gadag District

Details	Type	First Year	Second Year	Third Year
Taluks	Akshara	Mundargi		
	Non Akshara	Shirahatti		
No. of Schools	Akshara	9	9	9
	Non Akshara	9	9	9
No. of Students	Akshara	484	402	309
	Non Akshara	428	474	353
No. of Teachers	Akshara	22	21	17
	Non Akshara	17	15	14
Period of Data Collection		August - September - 2012 and Feb. -March 2013	August 2013 and January 2014	June-July 2014 and January-February, 2015

CHAPTER 2 REVIEW OF LITERATURE

2.1. INTRODUCTION

India's educational achievements in the recent past have had a mixed record (Kingdon 2006). While there has been significant recent progress in school participation, especially among children of primary school age, drop-out rates remain stubbornly high, and India still is home to around 40 percent of the world's illiterates. Perhaps the most disturbing feature of India's educational landscape is the low levels of learning attainment of children in primary and secondary levels of schooling – for example, around half of children in Standard III could not read a Standard I text in rural areas (ASER 2009). Das and Zajonc (2009) find that 42 percent of children enrolled in standard IX in Rajasthan and 50 percent in Orissa fail to meet a basic international low benchmark of mathematical knowledge. Based on data on test scores for these two states, they also find that the distribution of learning attainment in Indian school-children is highly skewed – while a small proportion of the school-going children are high

performers and their learning attainment is comparable to the top performers in most OECD countries, there is a large proportion of the school-going population whose level of learning attainment is abysmal and among the worst for countries where similar data is available.

Low learning attainment imply low cognitive skills, and since cognitive skills are a good predictor of how well the child may do in labour markets when she/he reaches adulthood, the low learning outcomes of a large proportion of school-children, especially in rural India, would act as an important constraint to these children obtaining well-paid jobs, especially as the demand for skilled workers increases relative to demand for unskilled workers with economic growth and in a rapidly modernising economy as we see in India currently. The role of cognitive skills in individuals earnings and economic growth is now well-recognised - as Hanushek and Woessmann (2008, p. 657) note, "Individual earnings are systematically related to cognitive skills. The distribution of skills in

society appears closely related to the distribution of income. Perhaps most importantly, economic growth is strongly affected by the skills of workers". Therefore, the low learning outcomes among India's school-going population can act as a significant constraint to future economic growth, and can have an adverse effect on the distribution of income.

Low educational attainment is particularly pronounced among children from socially disadvantaged backgrounds such as Scheduled Castes (SC) and Scheduled Tribes (ST) as well as among girls. For example, using the PROBE-data-set from five North-Indian states, Dreze and Kingdon (2001) suggest that SC children have an 'intrinsic disadvantage' with a relatively lower chance of going to school even after having controlled for household wealth, parental education and motivation, and school quality. With respect to gender disparities in educational attainment, Kingdon (2006) notes that among children aged 11-14 years, 10.3 per cent of girls were out of school as compared to 7.7 per cent of boys. Such strong disparities in educational attainment among children from SC/ST background and among girls is a

matter of significant concern as potentially low rates of cognitive skill acquisition among backward cast children, and among girls in their childhood years could play an important part in restricting earnings potential and in determining their poverty status later in life.

While the problem of low learning outcomes among a large proportion of school-going children in India is being increasingly recognised, it is not clear; however, what kind of policy intervention can have a significant positive effect on learning outcomes, especially among rural children from relatively poor background.

2.2. LEARNING SKILLS: VIEW FROM LITERATURE

There has been considerable progress in the provision of schooling inputs in the recent period in India. However, an important factor that determines how these inputs translate into learning outcomes is the structure of pedagogy and classroom instruction (Muralidharan, 2013). Developing an appropriate child-centred pedagogy is a daunting task for countries such as India given the situation that several millions of first-generation learners have joined a rapidly expanding national

schooling system. Learner-centred education (LCE) is perceived as a solution to a myriad of issues facing the school education system in many developing countries (Tabulawa, 1997; Nakabugo and Sieborger, 2001; Harley et al., 2000), and some researchers even call it as a policy panacea (Sripakash, 2010). It is expected that the effect of LCE would get reflected beyond the realm of education to address such broad and intractable issues as poverty (Brock, 2009); exclusivity (O'Sullivan, 2006); and the need for a democratic political culture (Harber, 2006).

Since the 1990s, child-centred ideas have been part of teacher training programmes and school reforms in many parts of Africa and Asia (Capper et al., 1997; Siraj-Blatchford et al., 2002). Following this, many countries have brought in reforms at the school level and child-centred ideas have increasingly found a place in the new curriculum. These learner-centred pedagogical practices have been introduced into classrooms or other learning environments using different strategies. National educational reform is one such principal channel using which many countries have introduced LCE into the

classroom learning. Countries such as South Africa, where learner-centred pedagogy was promoted in the post-apartheid era (Nakabugo and Sieborger, 2001 and Harley et al., 2000; Spreen and Vally, 2010), Namibia, where LCE has been enacted for teacher educators through Basic Education Teachers Diploma programme (BETD) (Nyambe and Wilmot, 2008; Dembele and Miaro-II, 2003), Poland, where learner-centred pedagogical practices have been part of the education system in the post-Communist period (Vulliamy and Webb, 1996), Tanzania, where a revised curricula for secondary schools developed in 2005 enact the use and promotion of LCE (Vavrus et al., 2011), Zambia, where the Teacher Education Reform Programme (ZATERP) introduced in the late 1990s place the learner at the centre of the educational process (Musonda, 1999), Turkey, which has revised the curriculum for primary schools in 2005 to accommodate student-centred pedagogical practices (Aksit, 2007; Altinyelken, 2010) and India, where child-centred pedagogy was made part of its universal elementary education programme called Sarva Shiksha Abhiyan (SSA) introduced in 2001 (Planning Commission,

2010), are examples of countries that followed this route. There are also innovations that are conceived, developed and implemented at the local level so as to integrate child-centred pedagogical practices into classroom learning. Innovations implemented in a teachers' college in Tanzania (Vavrus, 2009), science classrooms in Kenya (Ndirangu et al., 2003) and school-library program in Karnataka, India (Borkum et al. 2013) are examples of such local innovations.

In the midst of some available evidence on the positive effect of child-centred education on student outcomes (Piper et al. 2014), critics questions its suitability in all cultural and resource contexts, (Schweisfurth, 2011 for a detailed discussion on these challenges). While there has been a lot of policy rhetoric on child pedagogy, implementation plans have rarely matched the rhetoric (Jansen, 1989;Dello-lacovo, 2009), and “the governments' desire to be making visible, positive, modern changes drives policy forward at a pace which practice cannot match” (Schweisfurth, 2011). Another set of papers highlight material and practical issues in the implementation of these ideas.

The key concerns are infrastructure, class size, teaching materials, and teacher capacity (Schweisfurth, 2011). Teacher quality is another factor determining the success of the programme (Dello-lacovo, 2009). Some also point to the crucial and powerful role of donor agencies in shaping policy (Chisholm and Leyendecker, 2008). Some commentators, on the other hand, focused on the intrusion of western ideas into LCE ignoring the current educational needs of developing countries (see Thompson, 2013 for discussion surrounding this issue). While disputing the perception that LCE may be simply a western construct, Thompson (2013) argues that LCE initiatives can make a favourable impact if their professional language has been ‘culturally translated’.

2.3 THE DETERMINANTS OF EDUCATIONAL ATTAINMENT IN INDIA

An emerging literature has studied the determinants of educational attainment in India. Most of these studies have looked at school enrolment and drop-out rates, rather than learning outcomes as captured by test scores, possibly due to the lack of available data on the latter. In common with studies on schooling determinants in

other countries (e.g. Holmlund et al. 2011, Barnham 2004, Glewwe 2002), Dreze and Kingdon (2001) find that parental education, school infrastructure, and social background matter in explaining school participation rates, especially among girls. Kingdon and Teal (2007) find that teacher human capital (as proxies by teacher's education and experience) along with teachers' pay matter in explaining student achievement in numeracy and literacy. The sociological and anthropological literature (along with an emerging economics literature summarised in Akerl of and Kranton (2002)) highlight the role of social disadvantage and social identity - a person's sense of self - around caste/ethnicity and gender as a primary determinant of learning outcomes (Fuller and Clarke 1994, Nambissan 1996, 2007). In the case of India, SC/ST children and girls would be less likely to finish school or acquire the relevant skills because the social expectation within their community could be that they do not complete schooling or that they are less able or deserving than others. However, the presence of teachers sharing similar social background as the student could significantly help in overcoming this

bottleneck and improve the overall student performance (Rawal and Kingdon, 2010). A growing literature on developing countries suggest that the presence of female teachers would lead to higher levels of girls' enrolment and achievement and argue for hiring more female teachers (UNESCO, 2006). Rawal and Kingdon (2010) find that girls benefit from the presence of more female teachers in schools. Studies have also highlighted the importance of separate sanitary facilities for girl children to attend school, as well as feel part of the learning environment. Studies show that schools that provide better sanitation facilities for girls are likely to improve girls' participation and help achieve better educational outcomes (Ekpoet *al.*, 2008; UNICEF 2009; Bandyopadhyay, 2012).

There is an emerging literature on the evaluation of educational interventions on learning outcomes in India. Muralidharan et al. (2013) find no correlation between changes in average village-level school infrastructure (between 2003 and 2010) and student test scores. While studying the impact of a school-library program in Karnataka, Borkum et al. (2013) observe that infrastructure

intervention had no impact on student reading scores. Using the data from the Andhra Pradesh Randomized Evaluation Studies (APRESt) project, Muralidharan (2013) also finds no relationship between infrastructural availability in the school and measures of student test-score gains. There is also absence of any credible evidence on the impact of teacher characteristics on learning outcomes in schools. For instance, available studies do not report a significant positive relationship between teacher training and increases in test scores for students taught by the trained teacher (Kingdon and Teal 2010; Muralidharan and Sundararaman 2011b, 2013; Muralidharan 2012). Banerjee et al. (2007) in their experimental evaluation study find significant difference in test scores between students who received remedial instruction outside the class room and students who remained in the class room and did not receive any such instruction. The authors thus conclude that reducing class-size may have a limited impact on improving test scores. However, there have been few

studies that have systematically evaluated the impact of child pedagogical interventions in the Indian context (except the study on remedial instruction discussed earlier).

2.4 FEW OBSERVATIONS

The studies have shown that the learning levels of students in the primary and secondary levels have been a challenge and deserve attention from all corners. Such a phenomenon is quite severe in the children belonging to children from Scheduled Caste and Tribes. Similarly the girl children still lag behind as compared to the boys. Effective policy measures and interventions have been evading many of us in dealing with this issue for quite number of years. The overall school environment plays an important role in pushing forward the learning skills. Developing appropriate child-centred pedagogy would help in addressing this issue in a meaning full way. In this background the initiative by Akshara Foundation would be quite handy which addresses the needs of the children in a user friendly manner.

CHAPTER 3 FINDINGS OF THE STUDY

This chapter has been organised mainly in 4 sections. The first section presents the availability of school infrastructure, profile of teachers and profile of students in Koppal and Gadag districts. The second section presents results of classroom observation and classroom transactions. The third section presents performance of students during the reference period in Akshara and Non-Akshara schools in both the districts. The last section gives concluding observations.

3.1 SCHOOL INFRASTRUCTURE, PROFILE OF TEACHERS AND STUDENTS: KOPPAL DISTRICT

In this section, the availability of school infrastructure, profile of teachers and profile of students of selected schools in Koppal district have been presented.

3.1.1 SCHOOL INFRASTRUCTURE

A number of studies reveal that availability of pucca school building and other infrastructure facilities play important role in improving the performance of the students. In this section, availability of infrastructure facilities in the selected

schools in Koppal district has been examined. Table 3.1 shows number of selected schools by type of building in Koppal district. It shows that all the selected schools, both Akshara and Non Akshara, had pucca building which is really an encouraging factor.

Table 3.1: No. of Schools by Type of Building in Koppal District

School Category	Pucca	Semi Pucca	Total
Akshara	14	0	14
Non Akshara	13	0	13
Total	27	0	27

Table 3.2 shows availability of infrastructure facilities in selected schools in Koppal district. It can be observed from the table that major concerns in the district with regard to infrastructure in schools are availability of benches, play grounds, girls' urinals, computers and Science Laboratory. Thus there is a need to improve such facilities in the schools.

Table 3.2: Infrastructure Facilities at Schools in Koppal District (%)

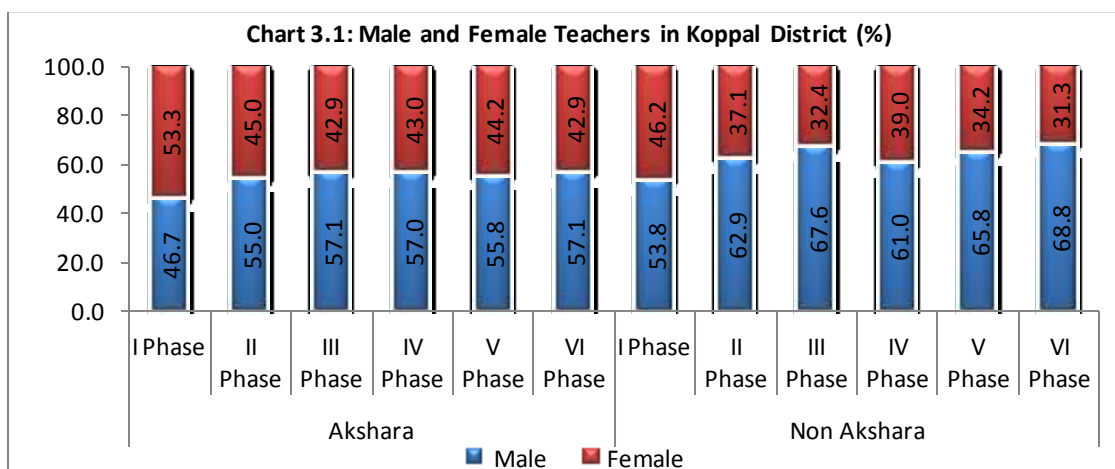
Facilities	Schools With Facilities	
	Akshara	Non Akshara
Benches	28.6	30.8
Playground	57.1	61.5
Library	85.7	100.0
TV	21.4	7.7
Radio	100.0	100.0
Girls' Urinals	78.6	76.9
Urinals	85.7	92.3
Girls Toilet	71.4	92.3
Drinking water	100.0	92.3
Computer	14.3	15.4
Science Lab	28.6	23.1
Midday meal	100.0	100.0

education of teachers and teachers with English medium learning have been examined. Chart 3.1 shows share of male and female teachers in selected schools of Koppal district. The table reveals that both Akshara and Non Akshara schools have more number of male teachers, except in first phase in Akshara schools.



3.1.2 PROFILE OF TEACHERS

In this section, the proportion of male/female teachers, social category of teachers, teachers' education, professional



Note: The survey as part of the study was spread over three years consisting of two phases per year amounting to a total of six phases

Teachers' Characteristics

Table 3.3 shows proportion of teachers by social category. The table

indicates that by and large, teachers belonging to OBC category are higher in both Akshara and Non Akshara schools. The

distribution of teachers across different social categories shows that in some years, teachers belonging to 'Others' category will be higher in number in Akshara schools.

Table 3.3: Teachers by Social Category in Koppal District (%)

Social Category	First Year		Second Year		Third Year	
	Akshara	Non Akshara	Akshara	Non Akshara	Akshara	Non Akshara
SC	17.5	11.4	19.0	8.7	20.9	10.5
ST	5.0	8.6	9.5	13.0	2.3	7.9
Minority	7.5	8.6	0.0	4.3	9.3	5.3
OBC	45.0	31.4	38.1	56.5	39.5	44.7
Others	25.0	40.0	33.3	17.4	27.9	31.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

Teachers' Education

Table 3.4 shows percentage of teachers by level of general education in selected schools of Koppal district. One can note that in both the categories of schools

majority of teachers are educated up-to PUC level followed by graduates. Presence of graduates is certainly advantageous for these schools.

Table 3.4: Teachers by Level of General Education in Koppal District (%)

General Education	First Year		Second Year		Third Year	
	Akshara	Non Akshara	Akshara	Non Akshara	Akshara	Non Akshara
10th Std	10.0	8.6	11.9	10.8	4.7	5.3
PUC	50.0	51.4	45.2	43.2	51.2	36.8
Degree	37.5	28.6	40.5	40.5	30.2	47.4
Post Graduation	2.5	11.4	2.4	5.4	14.0	10.5
Total	100	100	100.0	100.0	100.0	100.0

Professional Education of Teachers

Table 3.5 shows teachers with different levels of professional education. It reveals that most of the teachers had D.Ed.

qualification in Akshara and Non Akshara schools followed by teachers with B.Ed. qualification. It is interesting to note that in the second and third year there were

teachers who were trained in some way or the other.

Table 3.5: Teachers with Different Levels of Professional Education in Koppal District (%)

Training	First Year		Second Year		Third Year	
	Akshara	Non Akshara	Akshara	Non Akshara	Akshara	Non Akshara
D Ed	70.0	54.3	83.3	89.2	83.7	76.3
B Ed	10.0	17.1	16.7	10.8	16.3	23.7
No Training	2.5	8.6				
Others	17.5	20.0				
Total	100.0	100.0	100.0	100.0	100.0	100.0

Teachers with English Medium Learning

Table 3.6 shows medium of instruction of teachers at SSLC. It is interesting to note that more than 90 per cent of the teachers in both the categories

of schools had completed their education in Kannada medium. However Akshara schools were marginally better which had teachers with education in English medium.

Table 3.6: Medium of Instruction at SSLC for Teachers - Koppal District (%)

Medium	First Year		Second Year		Third Year	
	Akshara	Non Akshara	Akshara	Non Akshara	Akshara	Non Akshara
English	7.5	0.0	2.4	2.7	7.0	2.6
Kannada	92.5	100.0	97.6	97.3	93.0	97.4
Total	100	100	100.0	100.0	100.0	100.0

3.1.3 PROFILE OF STUDENTS

The profile of students has been analyzed taking into consideration mothers' and fathers' educational level and occupation. The type of PDS card indicates the economic status of the family of the students.



Table 3.7: Profile of Students in Koppal District (%)

Particulars	First Year			Second Year			Third Year		
	Akshara	Non Akshara	Total	Akshara	Non Akshara	Total	Akshara	Non Akshara	Total
SC, ST & OBC	90.1	90.9	90.46	90.6	93	91.8	87.6	92.6	90
Minority	0.8	1	0.95	1.5	1.2	1.3	2	1.6	1.8
Others	9.03	8.06	8.59	9.6	5.8	7.7	10.5	5.8	8.2
Students by Mothers' Education Level (%)									
Illiterate	60.64	59.7	60.22	55	60.2	57.6	29.8	42.9	36.4
Literate	13.24	9.7	11.64	15.7	10.6	26.2	22	17.7	19.8
Primary	21.66	18.96	20.43	23.8	18.2	21	41.3	24.3	32.8
Higher Primary & Above	4.46	11.64	7.71	5.5	11	8.25	6.9	15.1	11.1
Students by Mothers' Occupation (%)									
Agriculture (Land Owners)	5.45	0.3	3.11	3.4	0.3	1.9	3.6	0.4	2.1
Agricultural labor	63.49	60.3	62.04	65	61.8	63.4	66.9	64.9	66
Housewife	30.45	37.76	33.76	31	37	34	29.1	33.9	31.3
Others	0.62	1.64	1.08	0.7	0.9	0.8	0.4	0.8	0.6
Students by Fathers' Education Level (%)									
Illiterate	44.93	39.25	42.35	43.1	39.3	41.2	14.6	19.7	17.1
Literate	16.71	8.51	12.99	15	10.4	12.7	24.1	15.3	19.8
Primary	26.24	29.4	27.67	28	29.4	28.7	44.2	38.6	41.5
Higher Primary & Above	12.13	22.84	16.98	13.9	20.9	17.4	17.1	26.4	21.7
Students by Father' Occupation (%)									
Agriculture (Marginal Farmers)	77.1	67.46	72.73	75.9	71.4	73.7	80.8	76.3	78.7
Agricultural labor	19.93	25.37	22.4	21.7	22.3	22	17.2	17.9	17.5
Other	2.97	7.16	4.87	2.4	6.3	4.4	2	5.8	3.8
Students by Household PDS Card (%)									
BPL Card	89.11	89.85	89.45	87.7	92.4	89.9	89.1	91.6	90.3

From the above table one can note the Socio-economic Status (SES) of the students. Most of the students belong to the socially backward communities and BPL

status. For example in Akshara schools, SC, ST and OBC students are to the extent of about 90 percent and their respective number in Non Akshara schools is also

about 90 percent. Minorities range between 0 and 1 per cent. Around 90 per cent of mothers of these children are either illiterate, just literate or have completed primary education. With regard to mothers' occupation, one can note that 'agricultural labor' and 'house wife' account for more than 90 percent. Similar pattern is found as far as fathers' educational level and Household occupation are concerned. Around 90 percent of the students belong to the BPL status. On the whole one can say that the socio economic status in both the categories of schools remains the same.

- Display of timetable in the class room,
- Availability of Teaching and Learning Materials in the class room (TLM),
- Display of Mathematics charts and activities



3.2 CLASS ROOM OBSERVATIONS AND TRANSACTIONS: KOPPAL DISTRICT

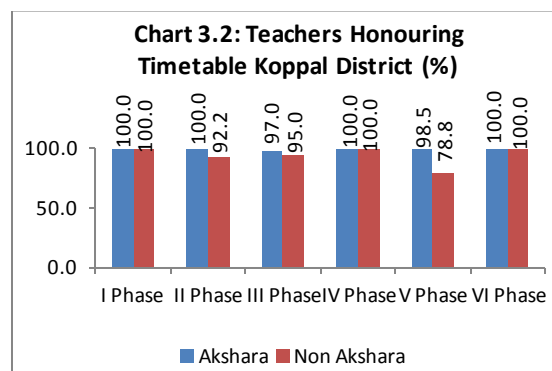
The study team also took note of the transactions within the classrooms in both Akshara and Non Akshara Schools. The idea was to catch with the kind of atmosphere that exists in the classroom and how the teachers are interacting with the students.

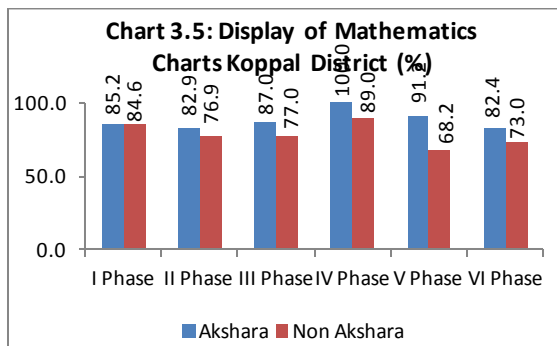
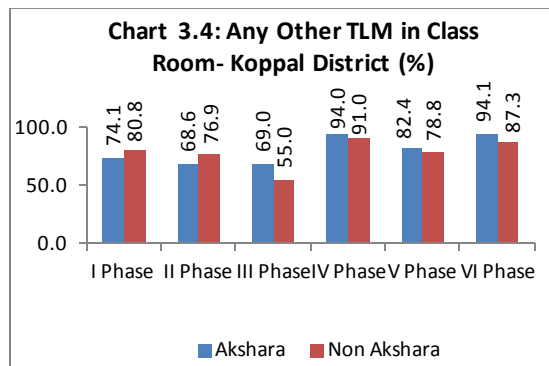
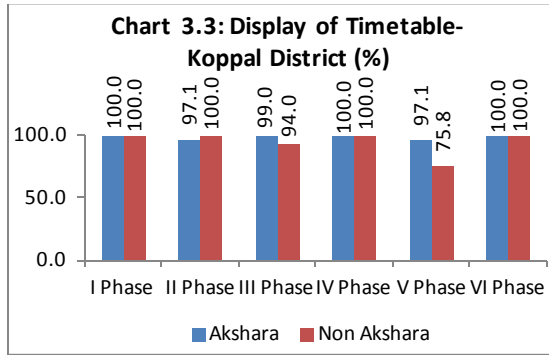
The following charts reveal that with regard to honoring time table, display of timetable, TLM and display of Mathematics charts and activities in the classroom, the Akshara schools are better in all the phases than Non Akshara schools.

3.2.1 CLASS ROOM OBSERVATIONS

In the selected schools, the class rooms have been observed to know the following.

- Honouring of time table by teachers,



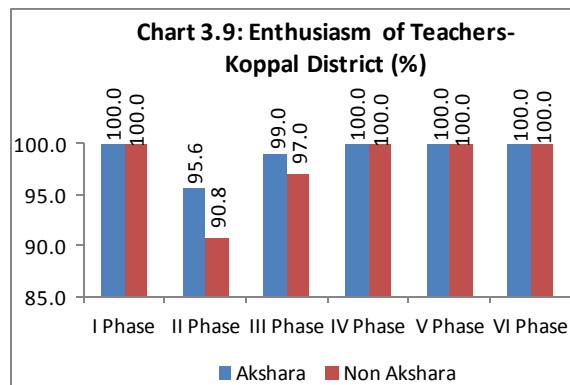
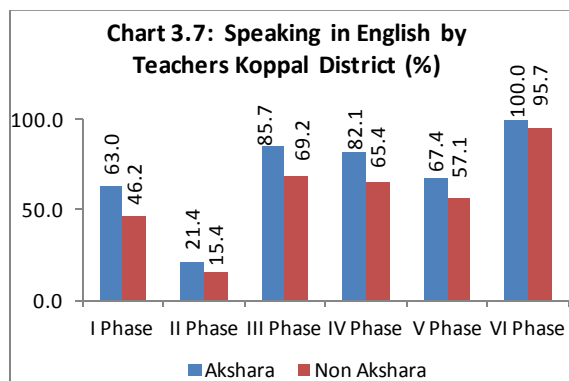
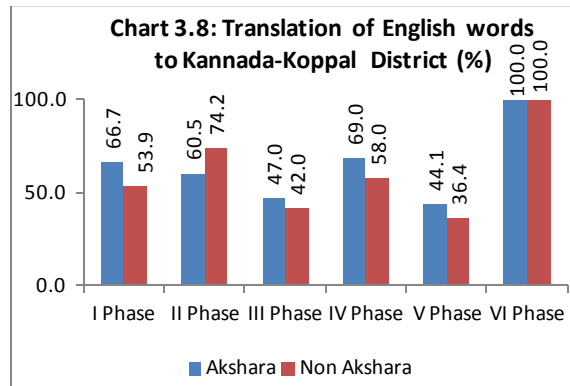
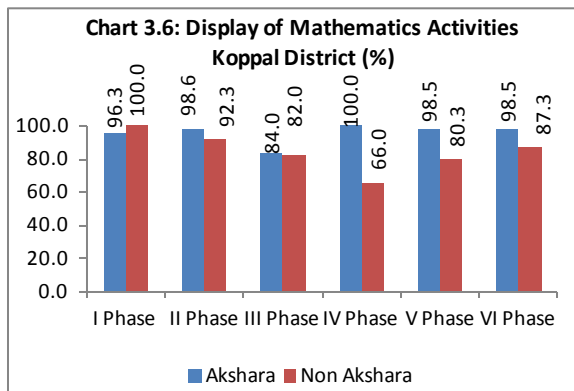


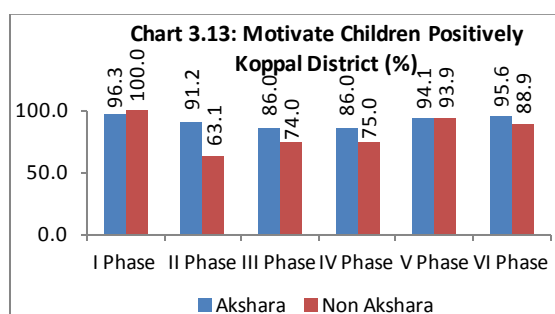
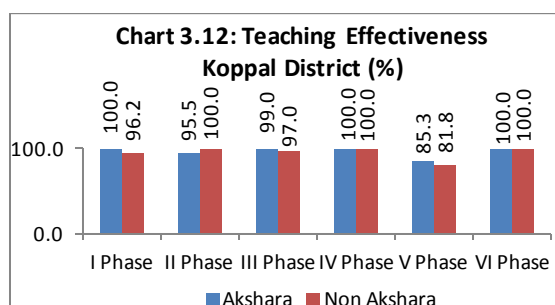
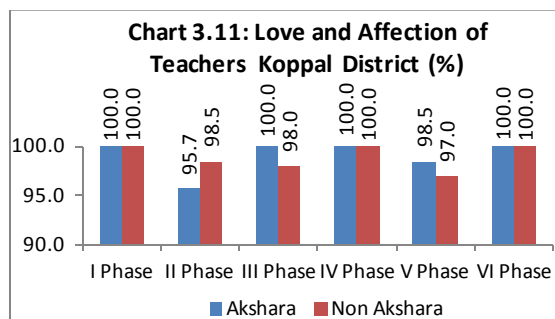
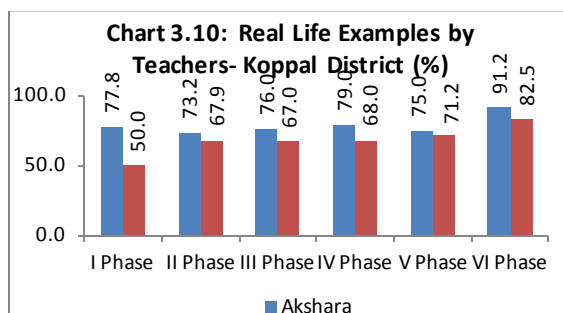
3.2.2 CLASS ROOM TRANSACTIONS

Charts 3.7 to 3.13: show classroom transactions in the selected Akshara and Non Akshara schools of Gadag district. The tasks of teachers in the classroom such as; speaking in English, translation of English words to Kannada, Enthusiasm of teachers, giving real life examples to students, love and affection towards the students, overall teaching effectiveness and motivating children to learn have been taken into consideration.

It can be observed from chart 3.7 that as regards Speaking in English by Teachers, Akshara schools are better in all the six phases except second and fourth phases. Interestingly as the intervention has progressed, the proportion of such behavior has increased among the Akshara Teachers. From chart 3.8, one can observe that Akshara Teachers are better in translating English words to Kannada. Chart 3.9 reveals that all the teachers in both Akshara and Non-Akshara are Enthusiastic in teaching during the reference period, except in phase 2 and phase3. In these phases Akshara schools are better as3 compared to Non-Akshara schools.

As far as providing Real life examples by teachers is concerned, Akshara schools are doing well in all the phases (Chart 3.10). Chart 3.11 reveals love and affection of teachers is slightly better in Akshara schools, except in phase 2. Chart 3.12 shows effectiveness of teachers. It reveals that teaching effectiveness in Akshara schools is better in all the phases, except in phase 2. Chart 3.13 shows proportion of teachers motivating students. It reveals that Motivation by teachers is also good in Akshara schools in all the phases, except phase 1.





3.3 SCHOOL INFRASTRUCTURE, PROFILE OF TEACHERS AND STUDENTS IN GADAG DISTRICT

In this section, the availability of school infrastructure, profile of teachers and profile of students of selected schools in Gadag district have been presented.

3.3.1 SCHOOL INFRASTRUCTURE

Table 3.8 shows number of schools by type of building in Gadag district. It indicates that all the schools had pucca building (except one) which is really an encouraging factor in this district as well. Following table depicts the picture.

Table 3.8: No. of Schools by Type of Building In Gadag District

School Category	Pucca	Semi Pucca	Total
Akshara	8	1	9
Non Akshara	9	0	9
Total	17	1	18

Table 3.9 shows availability of infrastructure facilities in selected schools in Gadag district. It indicates that the major concerns in the district with regard to infrastructure in schools are availability of benches, play grounds, girls’ urinals, computers and Science Laboratory. Thus there is a need to improve such facilities in the schools. Library is also a cause of concern in both the categories of schools. Availability of TV needs to be ensured.

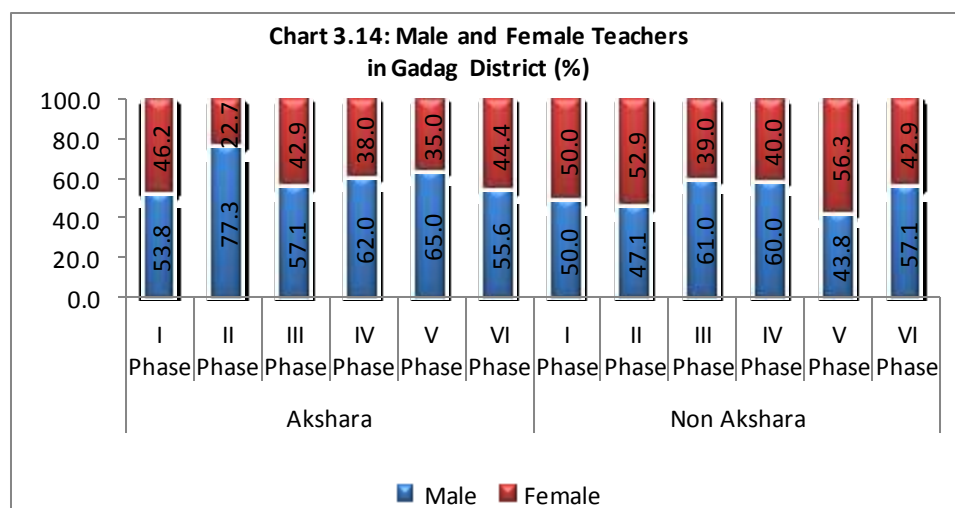
Table 3.9: Infrastructure Facilities at Schools in Gadag District (%)

Facilities	Schools With Facilities	
	Akshara	Non Akshara
Benches	77.8	55.6
Playground	77.8	55.6
Library	88.9	100.0
TV	22.2	22.2
Radio	100.0	88.9
Girls Urinals	77.8	55.6
Urinals	100.0	77.8
Girls Toilet	88.9	77.8
Drinking water	77.8	100.0
Computer	77.8	22.2
Science Lab	44.4	11.1
Midday meal	100.0	100.0

3.3.2 PROFILE OF TEACHERS

In this section, the proportion of male/female teachers, social category of teachers, teachers' education, professional education of teachers and teachers with English medium learning have been examined. Chart 3.14 shows share of male

and female teachers in selected schools of Gadag district. It indicates that male teachers are more in number than female teachers in both Akshara and Non Akshara schools. In the second phase Non Akshara schools had more female teachers than male teachers.



Teachers' Characteristics

Table 3.10 shows proportion of teachers by social category. It indicates that by and large teachers belonging to OBC category are higher in both Akshara and Non Akshara schools. The distribution of

teachers across different social categories shows that in some years teachers belonging to 'Others' will be higher in Akshara schools except for the third year. The table below gives the details.

Table 3.10: Teachers by Social Category in Gadag District (%)

Social Category	First Year		Second Year		Third Year	
	Akshara	Non Akshara	Akshara	Non Akshara	Akshara	Non Akshara
SC	22.7	11.8	19.0	8.7	20.9	10.5
ST	4.5	17.6	9.5	13.0	2.3	7.9
Minority	0.0	11.8	0.0	4.3	9.3	5.3
OBC	54.5	41.2	38.1	56.5	39.5	44.7
Others	18.2	17.6	33.3	17.4	27.9	31.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

Teachers' Education

Table 3.11 shows percentage of teachers by level of general education in selected schools of Gadag district. It reveals that in both categories of schools majority

of teachers are educated up-to PUC level followed by graduates. However, in the third year, graduates are more in Non Akshara schools. Presence of graduates is certainly advantageous for these schools.

Table 3.11: Teachers by Level of General Education - Gadag District (%)

General Education	First Year		Second Year		Third Year	
	Akshara	Non Akshara	Akshara	Non Akshara	Akshara	Non Akshara
10th Std	0.0	5.9	9.5	4.3	0.0	12.5
PUC	50.0	64.7	42.9	56.5	65.0	18.8
Degree	50.0	23.5	38.1	30.4	30.0	56.3
Post Graduation	0.0	5.9	9.5	8.7	5.0	12.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

Professional Education of Teachers

Table 3.12 shows teachers with different levels of professional education. It reveals that most of the teachers had D.Ed. qualification in Akshara and Non Akshara

schools followed by teachers with B.Ed. qualification. It is interesting to note that in the second and third year there were teachers who were trained in some way or the other. The table below gives the details.

Table 3.12: Teachers with Different Levels of Professional Education -Gadag District (%)

Training	First Year		Second Year		Third Year	
	Akshara	Non Akshara	Akshara	Non Akshara	Akshara	Non Akshara
D Ed	40.9	52.9	61.9	91.3	90.0	87.5
B Ed	18.2	0.0	38.1	8.7	10.0	12.5
No Training	9.1	5.9				
Others	31.8	41.2				
Total	100.0	100.0	100.0	100.0	100.0	100.0

Teachers with English Medium Learning:

Table 3.13 shows medium of instruction of teachers at SSLC. It is interesting to note that more than 90 per cent of the teachers in both the categories

of schools had completed their education in Kannada medium. However Akshara schools were marginally better which had teachers with education in English medium.

Table 3.13: Medium of Instruction at SSLC for Teachers - Gadag District (%)

Medium	First Year		Second Year		Third Year	
	Akshara	Non Akshara	Akshara	Non Akshara	Akshara	Non Akshara
English	0.0	11.8	4.8	0	5.0	
Kannada	100.0	88.2	95.2	100	95.0	100.0
Total	100.0	100.0	100	100	100.0	100.0

3.3.3 PROFILE OF STUDENTS

The profile of students has been analyzed taking into consideration, mothers' and fathers' educational level and occupation. The type of PDS card indicates

the economic status of the family of the students.

Table 3.14: Profile of Student in Gadag District (%)

Particulars	First Year			Second Year			Third Year		
	Akshara	Non Akshara	Total	Akshara	Non Akshara	Total	Akshara	Non Akshara	Total
Students by Social Category (%)									
SC, ST & OBC	46.07	67.29	56.03	54.4	68.8	61.6	53.9	74.9	65
Minority	2.07	0.7	1.43	2.5	1.1	1.8	2.9	1.7	2.3
Others	51.86	32.01	42.54	44.8	30.4	37.6	43.2	23.4	32.7
Students by Mothers' Education Level (%)									
Illiterate	33.88	18.46	26.64	36.3	30.8	33.6	40.1	35	37.4
Literate	0	0	0	0	0.2	0.1		0.3	0.2
Primary	47.73	69.86	58.11	47.8	62	54.9	47	61	54.5
Higher Primary & Above	18.39	11.68	15.24	15.9	7	11.45	12.8	3.7	8
Students by Mothers' Occupation (%)									
Agriculture (Land Owners)	0	0.7	0.33	0	0.6	0.3		0.9	0.5
Agricultural labor	83.06	81.78	82.46	84.1	82.9	83.5	85.6	81.1	83.2
Housewife	14.67	16.59	15.57	13.2	15.6	14.4	11.8	16.6	14.4
Others	2.27	0.93	1.64	2.7	0.8	1.75	2.6	1.4	2
Students by Fathers' Education Level (%)									
Illiterate	29.13	14.25	22.15	31.6	23.4	27.5	32.1	25.1	28.4
Literate	0.62	0	0.33	0.7	3.4	2.1	1	4.6	2.9
Primary	41.94	62.62	51.64	44.8	58	51.4	47.2	61.1	54.7
Higher Primary & Above	28.31	23.13	25.88	22.9	15.2	19.05	19.7	9.1	14
Students by Fathers' Occupation (%)									
Agriculture (Marginal Farmers)	13.22	5.84	9.76	11.7	4	7.8	10.8	2.9	6.6
Agricultural labor	75.41	89.49	82.02	75.4	91.8	83.6	78.4	92.3	85.8
Other	11.36	4.67	8.22	12.9	4.2	8.55	10.8	4.9	7.6
Students by Household PDS Card (%)									
BPL Card	50.83	31.54	41.78	44.3	39.2	41.8	51.5	61.4	56.2

From the table 3.14 one can note the Socio-Economic Status (SES) of the students. Most of the students belong to the socially backward communities and BPL status. For example in Akshara schools, SC, ST and OBC students are to the extent of about 90 percent and their respective number in Non Akshara schools is also around 90 per cent. Minorities range between 0 and 1 per cent. Around 90 per cent of mothers of these children are either illiterate, just literate or have completed primary education. With regard to mothers' occupation one can note that 'agricultural labor' and 'house wife' account for more than 90 percent. Similar pattern is found as far as fathers' educational level and Household occupation are concerned. Around 90 percent of the students belong to the BPL status. On the whole one can say that the SES status in both the categories of schools remains the same.

3.4 CLASS ROOM OBSERVATIONS AND TRANSACTIONS: GADAG DISTRICT

The study team also took note of the transactions within the classrooms in both Akshara and Non Akshara Schools in Gadag district. The idea was to catch with the kind of atmosphere that exists in the classroom

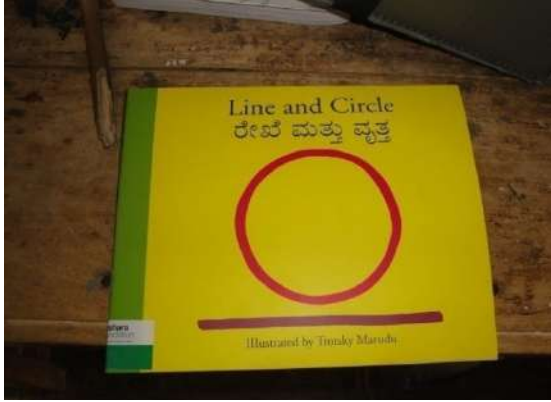
and how the teachers are interacting with the students.

3.4.1 CLASS ROOM OBSERVATIONS

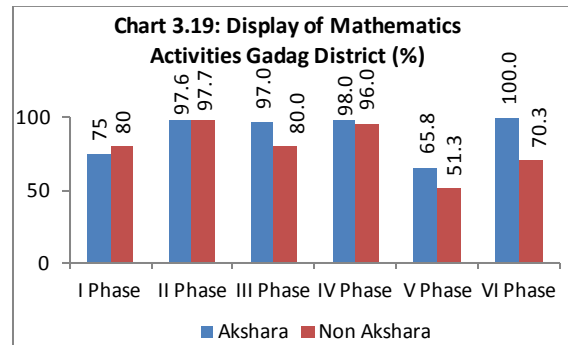
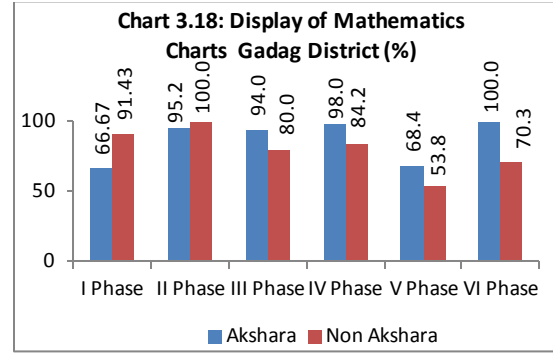
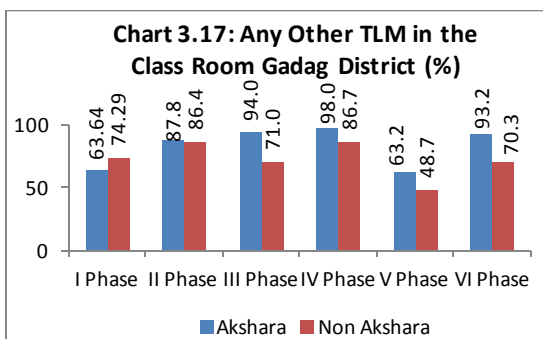
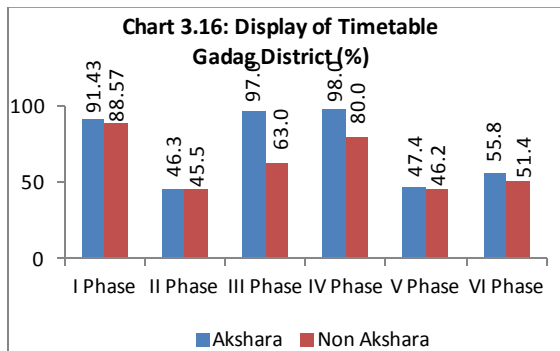
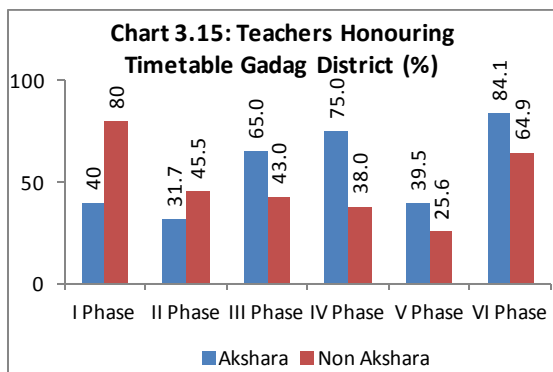
The class room observations reveal following picture.

- Teachers honouring time table – Akshara schools have picked up over the period of time
- Display of time table in classroom – Akshara schools are marginally better
- Presence of any other TLM – Akshara Schools are far ahead
- Display of Mathematics Charts – Akshara Schools have improved over the period of time
- Display of Mathematics activities – Akshara Schools are doing well





Following charts depict the picture

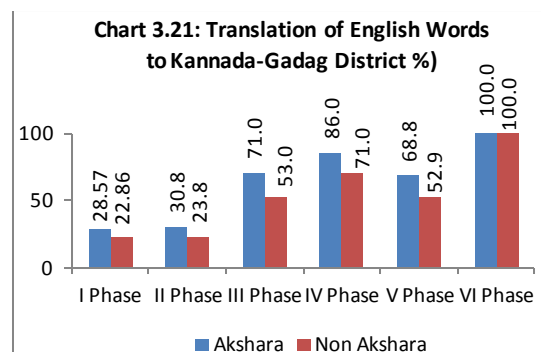
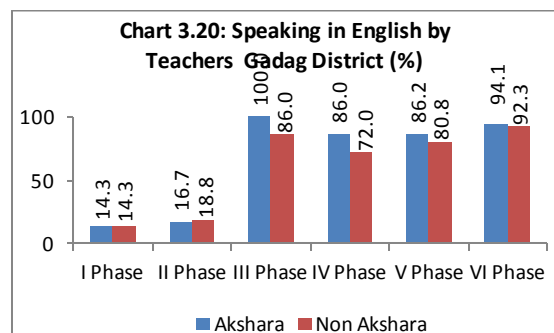


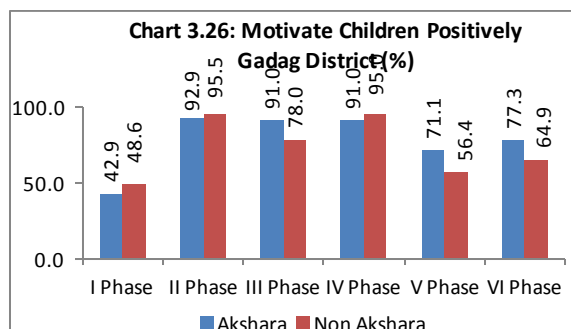
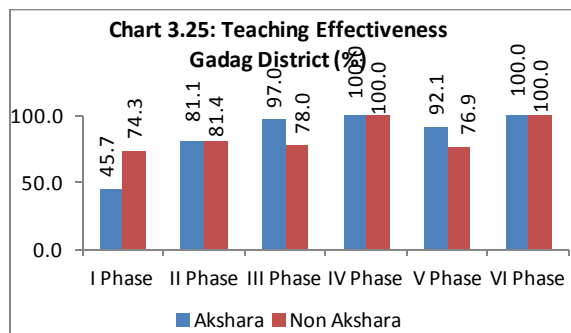
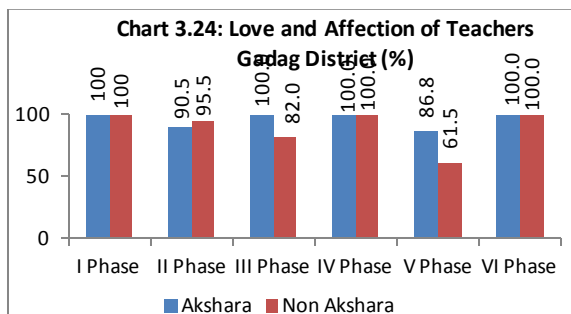
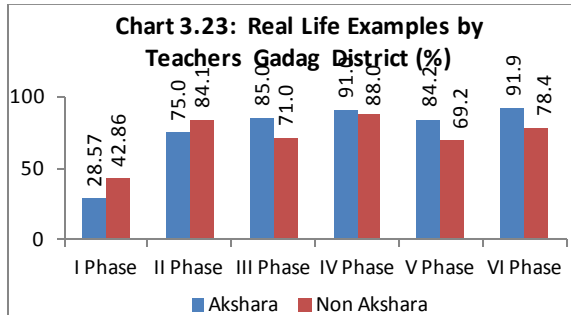
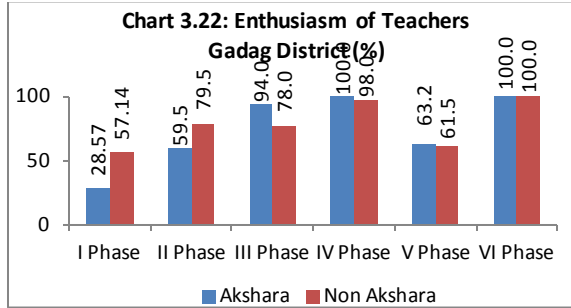
3.4.2 CLASS ROOM TRANSACTIONS

Charts 3.20 to 3.26, show classroom transactions in the selected Akshara and Non Akshara schools in Gadag district. The tasks of teachers in the classroom such as; speaking in English, translation of English words to Kannada, Enthusiasm of teachers, giving real life examples to students, love and affection towards the students, overall teaching effectiveness and motivating children to learn have been taken into consideration. Chart 3.20 shows that the proportion of teachers speaking in English is more in Akshara schools compared to Non-Akshara schools in all the phases, except phase 2.

From chart 3.21, one can observe that Akshara Teachers are better in translation of English words to Kannada in all the phases. However, in the sixth phase, both the schools have made it with 100 per cent achievement. Chart 3.22 reveals that Enthusiasm of Teachers has picked up in Akshara schools, after 2 phases. In phase 6, all the teachers in both Akshara and Non-Akshara schools are found enthusiastic. As far as providing Real life examples by teachers is concerned, Akshara schools are doing well in all the phases (Chart 3.23).

Chart 3.24 reveals love and affection of teachers is slightly better in Akshara schools. Chart 3.25 shows effectiveness of teachers. It reveals that after the first phase, Akshara schools have picked up and teaching effectiveness in Akshara schools is better compared Non-Akshara schools. Chart 3.26 shows proportion of teachers motivating students. It reveals that Motivation by teachers is also good in Akshara schools in all the phases, except phase 1.





3.5 PERFORMANCE OF STUDENTS IN MATHEMATICS

Tests were conducted in Mathematics for the students of both Akshara and Non Akshara schools to understand the impact of the Akshara initiatives. Tests were administered to understand the learning abilities of these students. In the following discussion, an attempt is made to present the results of these tests.

3.5.1 PERFORMANCE OF STUDENTS IN MATHEMATICS: KOPPAL DISTRICT

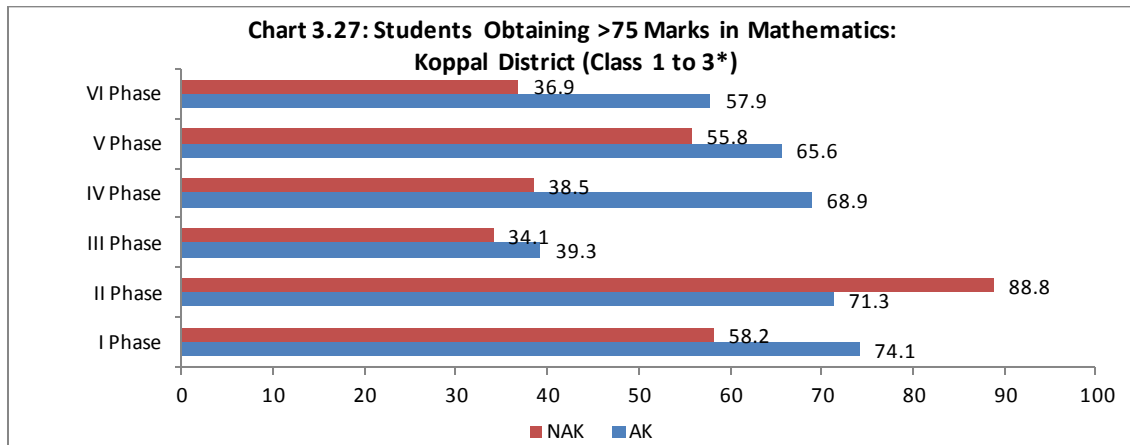
The following section presents the performance of students in Mathematics for class 1 to 3, class 2 to 4 and class 3 to 5 for different phases of the survey in Koppal district.

Performance of students in mathematics for classes 1 to 3

The charts below show the performance of students in Mathematics in Koppal district (class 1 to 3). Chart 3.27 shows proportion of students who obtained more than 75 percent in Mathematics in Akshara and Non Akshara schools. The chart reveals that the performance of Akshara students is better than Non Akshara students. The proportion of students who got more than 75 marks has been declining

in both the types of schools but the extent of decline is more in Non Akshara schools compared to Akshara schools. **This shows the effectiveness of Akshara initiatives in improving and maintaining the**

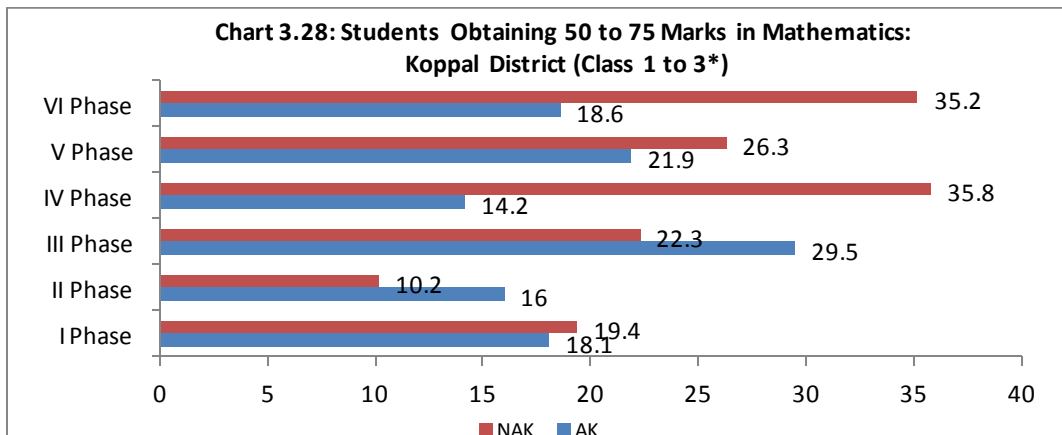
performance of students in Akshara schools as far as Mathematics is concerned.



*Class 1 = Phase I & II, Class 2 = Phase III & IV, Class 3 = Phase V & VI

Chart 3.28 shows proportion of students who obtained 50 to 75 marks in Mathematics in Koppal district. It reveals that except for phase 2 and phase 3, the Non Akshara students are performing better as compared to Akshara students.

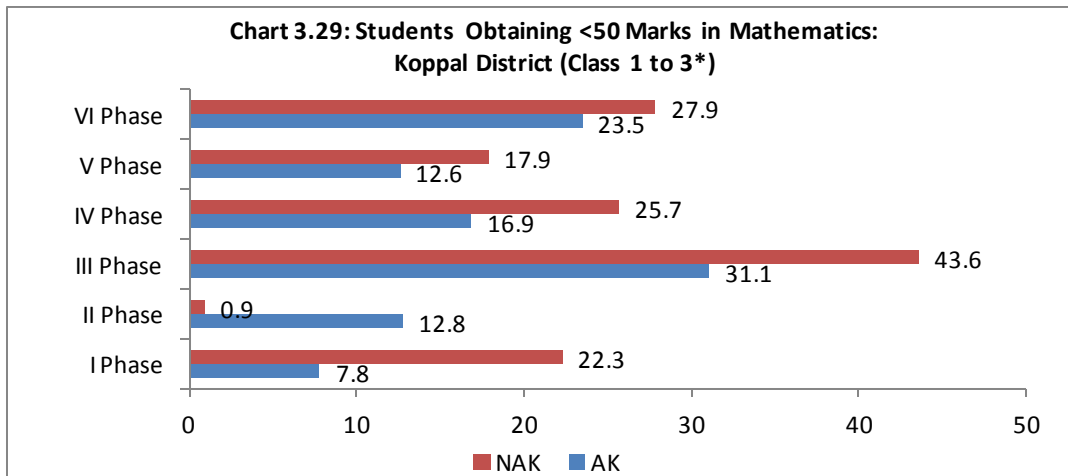
The proportion of students who got 50 to 75 marks has increased greatly (from 19.4 percent in phase 1 to 35.2 percent in phase 6) in Non Akshara this proportion has increased slowly (from 18.1 percent in phase 1 to 18.6 percent in phase 6).



*Class 1 = Phase I & II, Class 2 = Phase III & IV, Class 3 = Phase V & VI

Chart 3.29 (below) shows proportion of students who obtained less than 50 marks in Mathematics in Koppal district. It reveals that except in phase 2, the proportion of students who obtained less than 50 marks is less in Akshara students as

compared to Non Akshara students. But over the period of time, the proportion of students in this group has increased in the same rate in both Akshara and Non Akshara students.



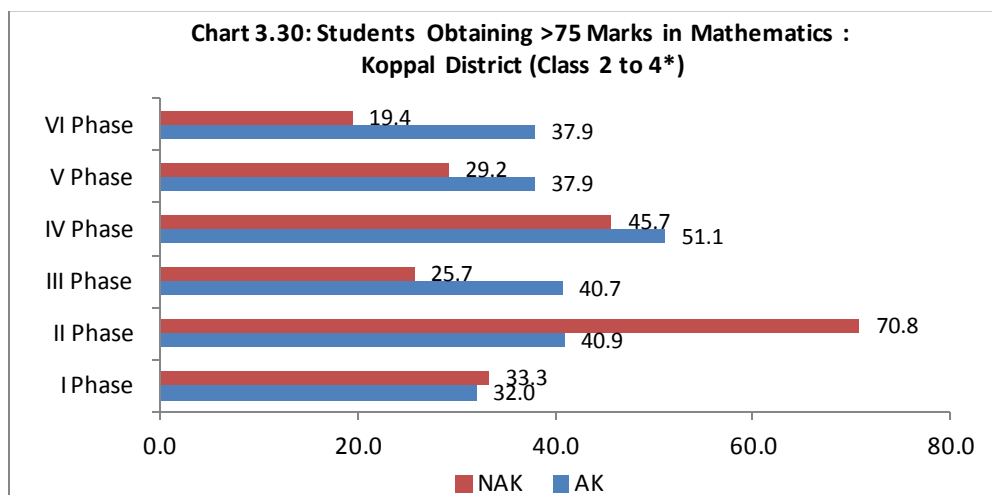
*Class 1 = Phase I & II, Class 2 = Phase III & IV, Class 3 = Phase V & VI

Taking into account the presence of greater number of students in > 75% category the Akshara Schools are doing better than the Non Akshara schools.

Performance of Students in Mathematics for Classes 2 to 4

The following charts give the performance of students in mathematics for classes 2 to 4. Chart 3.30 shows that the proportion of students who obtained more

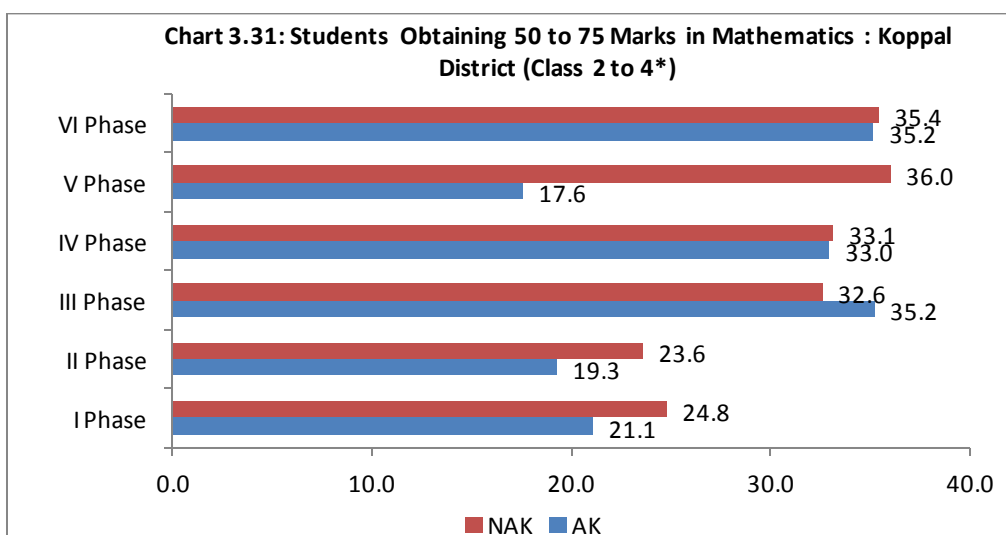
than 75 marks is more in case of Akshara students (except first two phases) as compared to Non Akshara students. Over the period of time the proportion of students in this group has increased in case of Akshara but in case of Non Akshara it has been declining. **This indicates that Akshara students were trailing behind and as the intervention has progressed the performance of Akshara students has improved.**



*Class 2 = Phase I & II, Class 3 = Phase III & IV, Class 4 = Phase V & VI

Chart 3.31 shows proportion of students who obtained 50 to 75 marks in Mathematics in Koppal district. This indicates that proportion of students in this

group is almost similar with the exception of phases I, II and III. One can say that both the categories of students are on the same page in this category of results.

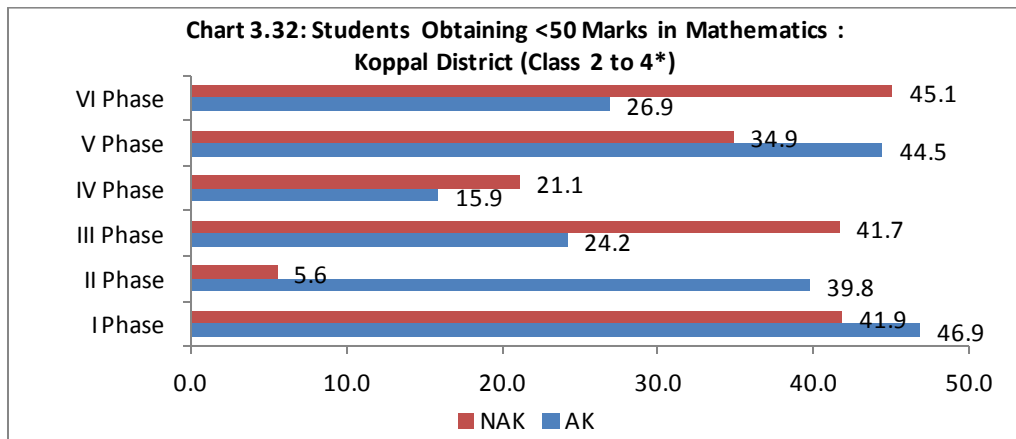


*Class 2 = Phase I & II, Class 3 = Phase III & IV, Class 4 = Phase V & VI

Chart 3.32 shows proportion of students who obtained less than 50 marks in Mathematics in Koppal district (Class 2 to 4). It reveals that as the intervention has

progressed, the proportion of students getting less than 50 marks has declined in Akshara schools, (i.e. students have moved to greater than 75 marks category),

whereas in case of Non Akshara schools the proportion of such students has increased over the time period.



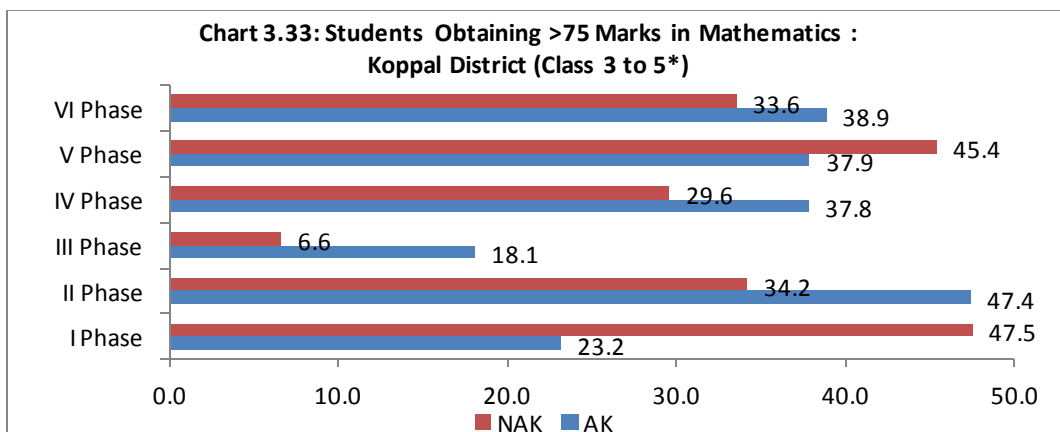
*Class 2 = Phase I & II, Class 3 = Phase III & IV, Class 4 = Phase V & VI

On the whole, the Akshara students are doing better as compared to Non Akshara students.

Performance of Students in Mathematics for Classes 3 to 5

For classes 3 to 5, better performance of Akshara students continues, compared with Non Akshara, except for first and fifth phase (Chart 3.33). Over the period, the proportion of students

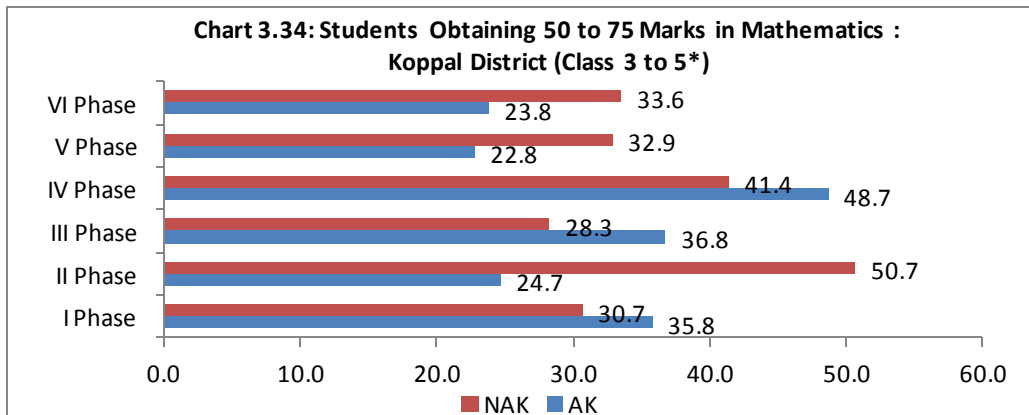
who got more than 75 marks has increased in case of Akshara students (from 23.2 percent in phase 1 to 38.9 percent in phase 6) and in case of Non Akshara students it has declined (from 47.5 percent in phase 1 to 33.6 percent in phase 6). Both Akshara and Non Akshara scores have decreased in Phase 3. This is an enigma which is likely to appear in such field based investigations.



*Class 3 = Phase I & II, Class 4 = Phase III & IV, Class 5 = Phase V & VI

Chart 3.34 shows proportion of students who obtained 50 to 75 marks in Mathematics in Koppal district for class 3 to 5. This indicates that in 3 phases the proportion of students who obtained 50 to 75 marks is more in Akshara and in other 3

phases Non Akshara students are more. Over the period of time, the proportion of students in this category has been declining in both Akshara and Non Akshara and this decline is more in case of Akshara.



*Class 3 = Phase I & II, Class 4 = Phase III & IV, Class 5 = Phase V & VI

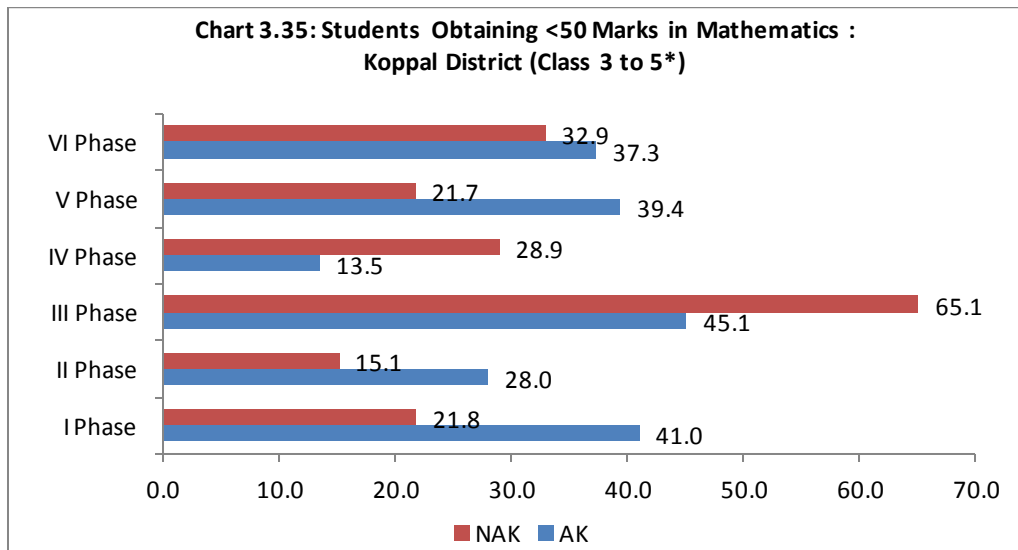


Chart 3.35 shows proportion of students who obtained less than 50 marks

in Mathematics in Koppal district (Class 3 to 5). It reveals that as the intervention has

progressed, the proportion of students getting less than 50 marks has been declining in Akshara schools, whereas in

case of Non Akshara schools the proportion of such students in this category has been increasing over the period of time.



**Class 3 = Phase I & II, Class 4 = Phase III & IV, Class 5 = Phase V & VI*

On the whole, the performance of Akshara students is better and as the intervention has progressed, the students' progress has improved in Mathematics in Koppal district for class 3 to 5.

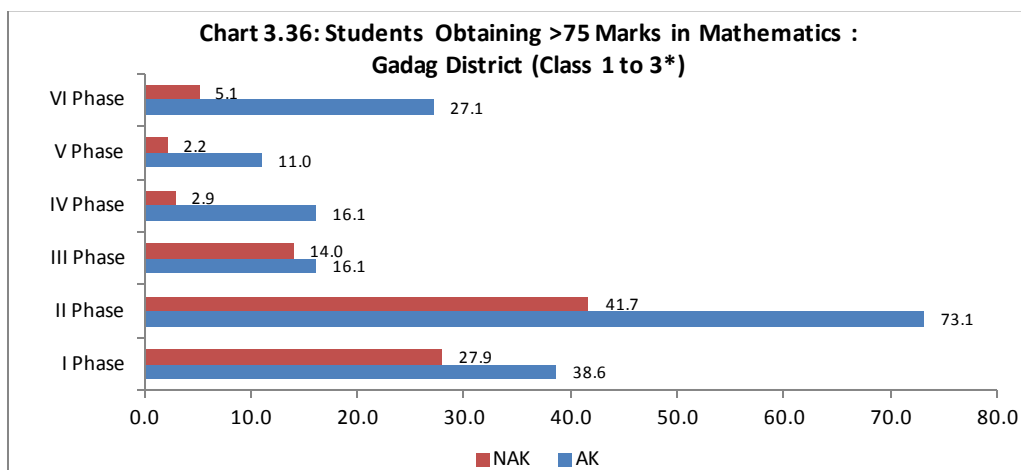
3.5.2 PERFORMANCE OF STUDENTS IN MATHEMATICS: GADAG DISTRICT

The following section presents the performance of students in Mathematics for class 1 to 3, class 2 to 4 and class 3 to 5

for different phases of the survey in Gadag district.

Performance of Students in Mathematics for Classes 1 to 3

It can be observed from the chart below that the Akshara Students are doing well in mathematics as compared to the Non Akshara students (Chart 3.36) in Gadag district. But over the period of time the proportion of students who got more than 75 marks has been declining in both Akshara and Non Akshara schools.

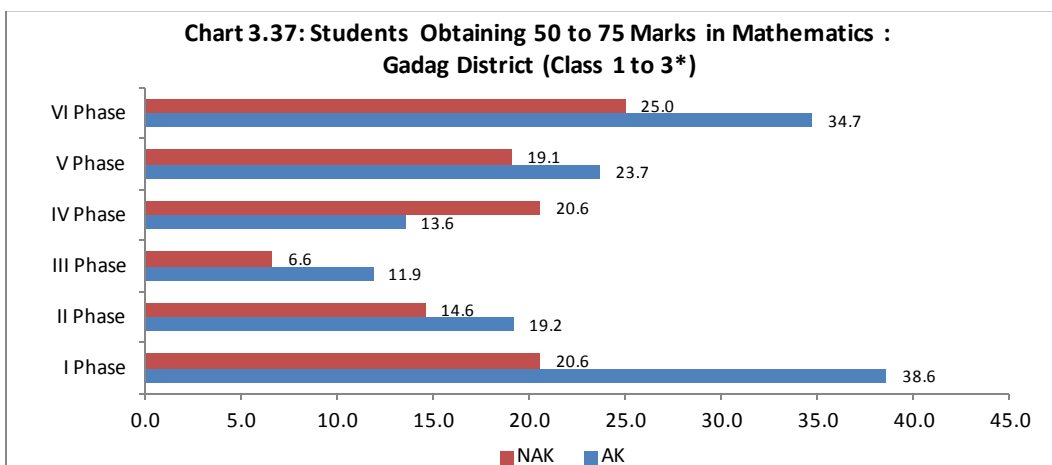


*Class 1 = Phase I & II, Class 2 = Phase III & IV, Class 3 = Phase V & VI



Chart 3.37 shows proportion of students who obtained 50 to 75 marks in Mathematics in Gadag district for class 1 to 3. It reveals that the performance of Akshara students is better in first, second, third,

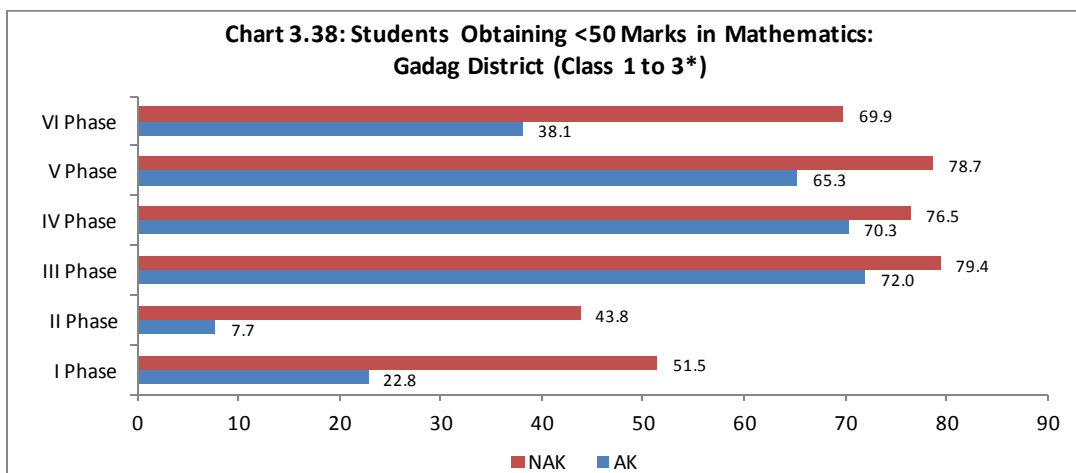
fourth and sixth phases. The proportion of students in this group in case of Akshara has remained steady over the period of time but in case of Non Akshara it has been increasing.



*Class 1 = Phase I & II, Class 2 = Phase III & IV, Class 3 = Phase V & VI

Chart 3.38 shows proportion of students who obtained less than 50 marks in Mathematics in Gadag district (Class 1 to 3). It reveals that the proportion of students who got less than 50 marks is less in case of

Akshara as compared to Non Akshara. But it seems that over the period of time the proportion of such students has increased in both Akshara and Non Akshara schools.



*Class 1 = Phase I & II, Class 2 = Phase III & IV, Class 3 = Phase V & VI

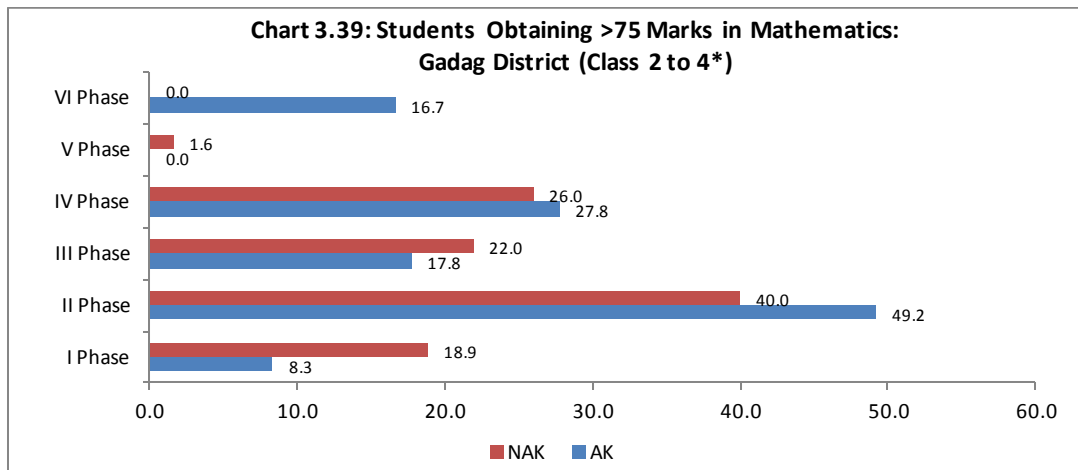
On the whole, Akshara students are doing well in mathematics as compared to the Non Akshara students in Gadag district for class 1 to 3.

Performance of Students in Mathematics for Classes 2 to 4

The following charts give the performance of students in mathematics in Gadag district for classes 2 to 4. It can be observed from chart 3.39 that (in the

percentage category of > 75 %) except for the first, third and fifth phases, the Akshara

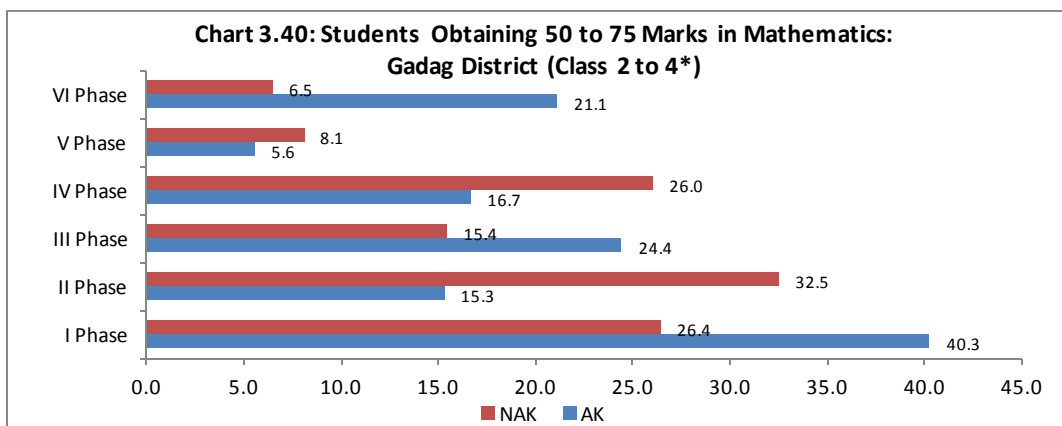
students are doing better than their counterparts in Non Akshara schools.



*Class 2 = Phase I & II, Class 3 = Phase III & IV, Class 4 = Phase V & VI

Chart 3.40 shows proportion of students who obtained 50 to 75 marks in Mathematics in Gadag district for class 2 to

4. It reveals that the proportion of students in this category has been declining in both Akshara and Non Akshara schools.



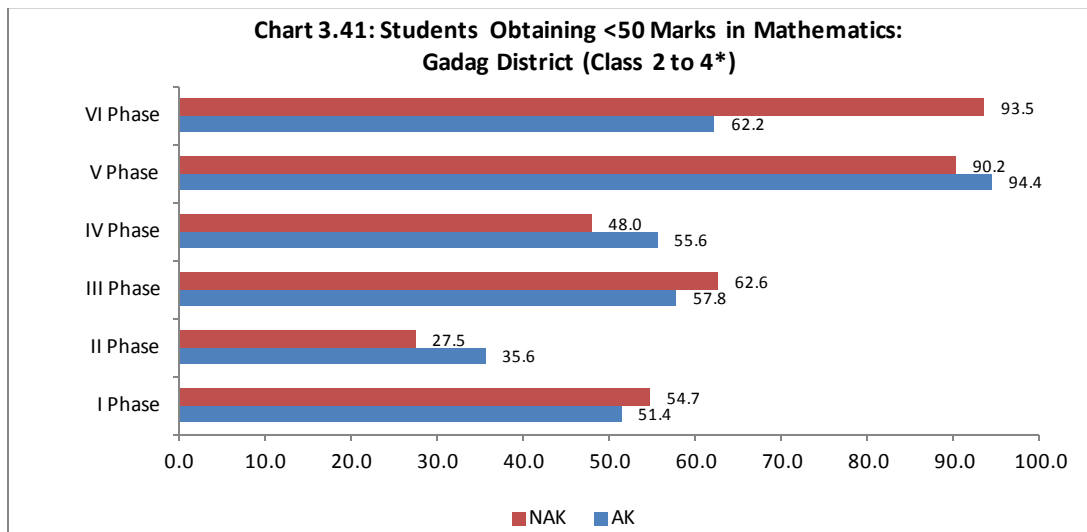
*Class 2 = Phase I & II, Class 3 = Phase III & IV, Class 4 = Phase V & VI

Chart 3.41 shows proportion of students who obtained less than 50 % marks in Mathematics in Gadag district for class 2 to 4. It indicates that in 3 phases Akshara students are doing better i.e. second, fourth and fifth phases as compared to Non

Akshara students. But over the period of time, proportion of students who are getting less than 50 marks has been increasing in both Akshara and Non Akshara schools i.e. from 51.4 % to 62.2% and 54.7% to 93.5% respectively. This shows that

students, especially from Non Akshara have moved from higher grades to lower grades over the period of time. This indicates

importance of Akshara intervention in maintaining the performance of students over the period of time.

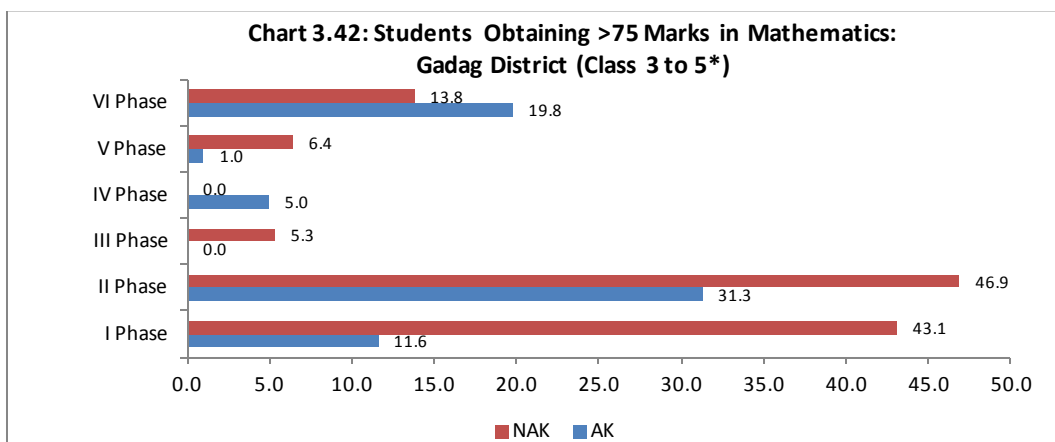


**Class 2 = Phase I & II, Class 3 = Phase III & IV, Class 4 = Phase V & VI*

On the whole, the Akshara students are doing better than Non Akshara students. But the proportion of students getting less than 50 marks has been increasing over the period of time in both Akshara and Non Akshara schools. This is the challenge for the Akshara team to look into.

Performance of Students in Mathematics for Classes 3 to 5

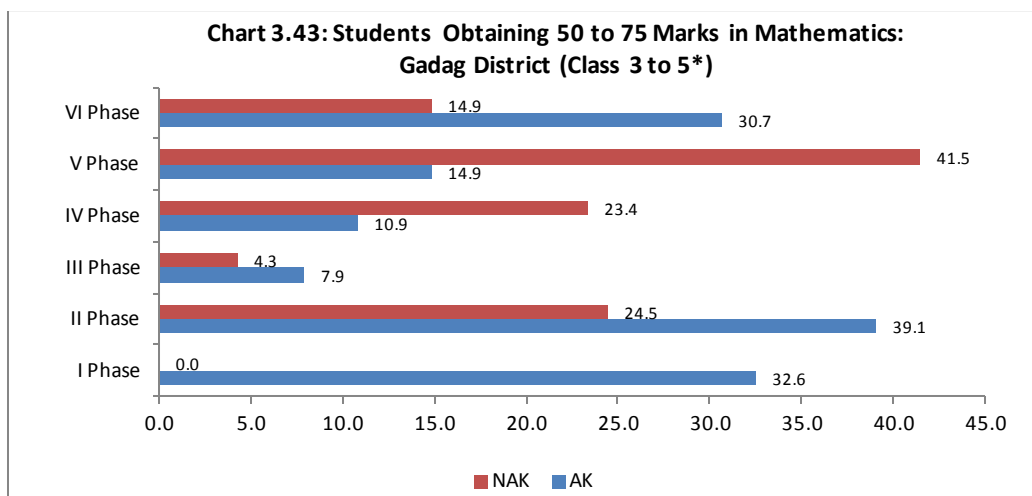
The following charts give the performance of students in mathematics in Gadag district for classes 3 to 5. From chart 3.42, one can observe that Akshara students are doing well in fourth and sixth phases. It is interesting to note that Non Akshara students are better than Akshara students in this category. On some occasions it is quite natural that players from the other side can do well.



*Class 3 = Phase I & II, Class 4 = Phase III & IV, Class 5 = Phase V & VI

Chart 3.43 shows proportion of students who got 50 to 75 marks in Mathematics in Gadag district for classes 3 to 5. It reveals that Akshara students are

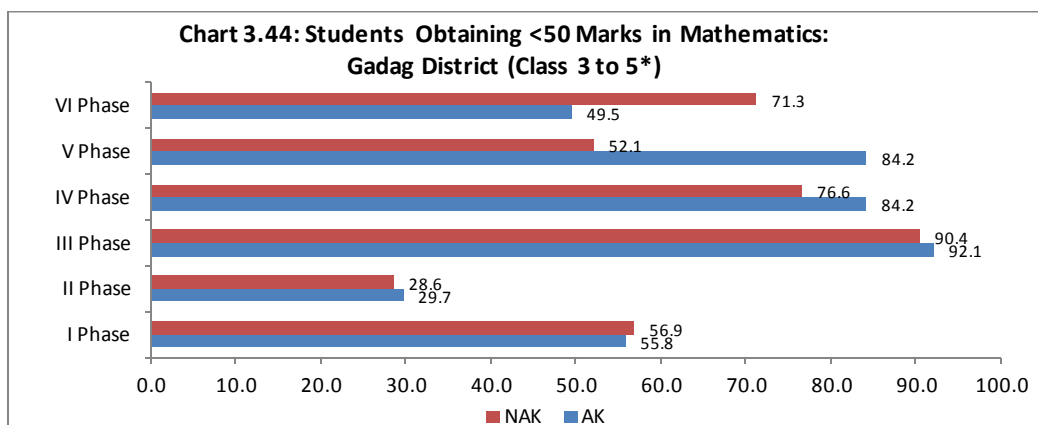
doing better in first, second and sixth phases. It seems that the performance of Akshara students has improved over the period of time as well.



Class 3 = Phase I & II, Class 4 = Phase III & IV, Class 5 = Phase V & VI

Chart 3.44 shows proportion of students who got less than 50 marks in Mathematics in Gadag district for classes 3 to 5. It reveals that most of the students got less than 50% marks in Mathematics in Gadag district in both Akshara and Non

Akshara schools. One can say that Mathematics is still a issue which needs greater attention. Improving the performance of these students will be the task of Akshara team in the days to come.



*Class 3 = Phase I & II, Class 4 = Phase III & IV, Class 5 = Phase V & VI

On the whole, the Akshara students are doing better than Non Akshara students. But significant proportion of students who got less than 50 marks in both

Akshara and Non Akshara schools. Efforts should be made to improve their performance.

3.6 CONCLUDING OBSERVATIONS

Infrastructure, Teachers, Students, Class Room Observations and Class Room Transactions KOPPAL DISTRICT

Inputs	Findings
Infrastructure	All the selected schools had a pucca building. Availability of benches, play grounds, girls' urinals, computers and Science Laboratory are lacking.
Teachers Profile	Male teachers are more. Teachers belonging to OBC category are higher in both Akshara and Non Akshara schools. Majority of teachers are educated up-to PUC level. Most of the teachers had D.Ed. qualification in Akshara and Non Akshara schools. More than 90 per cent of the teachers in both the categories of schools had completed their education in Kannada medium.
Students Profile	About 90 percent of the students belong to SC, ST and OBC category in both Akshara and Non Akshara schools.
Classroom Observations	With regard to honoring time table, display of timetable, TLM and display of Mathematics charts and activities in the classroom, Akshara schools are better in all the phases than Non Akshara schools.
Classroom Transactions	Akshara Teachers are better with regard to; speaking in English by Teachers and translation of English words to Kannada. Similar trend is also found with regard to Enthusiasm of Teachers, providing Real life examples by teachers, Love and affection of teachers, Effectiveness of teachers and Motivation by teachers.

GADAG DISTRICT

Inputs	Findings
Infrastructure	All the schools had pucca building (except one). Availability of benches, play grounds, girl's urinals, computers and Science Laboratory are lacking.
Teachers Profile	On the whole Male teachers are more in number. Teachers belonging to OBC category are higher in both Akshara and Non Akshara schools. Majority of teachers are educated up-to PUC level. Most of the teachers had D.Ed. qualification in Akshara and Non Akshara schools. More than 90 percent of the teachers in both the categories of schools had completed their education in Kannada medium.
Students Profile	About 90 percent of the students belong to SC, ST and OBC category in both Akshara and Non Akshara schools.
Class Room Observations	With regard to honoring time table (picked up over the period of time in Akshara schools), display of timetable (marginally better in Akshara schools), TLM and display of Mathematics charts and activities in the classroom, the Akshara schools are better than Non Akshara schools.
Class Room Transactions	With regard to speaking in English by Teachers and translation of English words to Kannada, Enthusiasm of Teachers, providing Real life examples by teachers, Love and affection of teachers, Effectiveness of teachers and Motivation by teachers it is interesting to note that Akshara Teachers are better.

Performance of Students in Mathematics**KOPPAL DISTRICT**

Classes	Performance
1 to 3	Performance of Akshara students is better than Non Akshara students (classes 1 to 3)
2 to 4	Akshara students are doing better compared to Non Akshara students. These students were trailing behind and as the intervention has progressed the performance of Akshara students has also improved.
3 to 5	Performance of Akshara students is better and as the intervention has progressed, the students progress has improved in Mathematics in Koppal district for classes 3 to 5.

GADAG DISTRICT

Classes	Performance
1 to 3	Akshara students are doing well in mathematics as compared to the Non Akshara students in Gadag district for classes 1 to 3
2 to 4	Akshara students are doing better than Non Akshara students but this performance needs to be maintained
3 to 5	Performance of Akshara students has been improving compared to Non Akshara students.

In sum, if one looks at the Akshara intervention in both the districts, the news seems to be good and encouraging. For example both input and outcome indicators due to such intervention have improved in Akshara schools as compared to the Non Akshara schools. The indicators of Classroom transactions as well as Classroom observations have been better in Akshara schools and they have also improved as the intervention has progressed. Such improvement has its impact on the learning skills of the students which is exhibited by the performance of Akshara students in Mathematics tests which were administered to both Akshara and Non Akshara schools. Out of the total six phases spread over three years, one can observe that by and large Akshara students have performed better than Non Akshara students. This only brings home the fact that Akshara intervention has served the purpose for which it was initiated. This also supports the argument of scaling up such intervention in other parts of the state.

Akshara initiative has made a positive impact on the classroom transactions and hence on the performance of students as well. Akshara students are

doing well in mathematics as compared to the Non Akshara students in the districts. The fact that greater proportion of Akshara students were found in >75 percentage brackets in all the three years of intervention itself is a proof that the students have been benefitted by the Akshara initiative. Keeping aside certain factors which are beyond the control of any initiative like Educational background of parents, Socio-economic status of the students, the Akshara initiative has made significant impact on the learning levels of the students. Based on our field experiences and our analysis of the cohort data we would like to place the following suggestions for the Akshara initiative.

3.6.1 COMBINED REPORT OF ECONOMETRIC ANALYSES BASED ON DATA FROM PHASE 1 TO 6

Before we discuss the results based on Akshara intervention, there are two points we would like to mention: First, since this is a cohort study with intervention in Mathematics for students from Standard 1 to 5. This implies that after 4th phase, students in 1st had already moved to standard three. Correspondingly students from Class 4 would have moved to Class 6, thus not part of the sample

Further, to ensure comparability, our analysis included only those students who have attended both pre-test and end-line test. For different phases we estimated the impact in three different ways:

- a) District wise each standard separately,
- b) Each district (Koppal and Gadag) separately;
- c) Combined (both districts together) but each standard separately.

Following are our key findings based on analysis of phases 1 to 6.

- ❖ Irrespective of standard, location, or class, students who secured higher percentage marks in phase 1 or phase 3 or phase 5, their gain is statistically lower than that of students who secured lower marks in phase 2 or phase 4 or phase 6 respectively.
- ❖ In phases 1 and 2, intervention in mathematics benefited students in standard 3 in Koppal district, whereas students in 4th and 5th standard benefited in Gadag.
- ❖ For 3rd and 4th phase, for standard 2 and standard 3 students – in Koppal – Akshara students have done statistically better for Mathematics intervention. For standard 4 and 5 students – there is no statistically different impact of intervention in both the districts. In Gadag for mathematics intervention, students in standard 2 have benefited.
- ❖ In 5th and 6th phases Akshara intervention yielded higher results in most cases except for Standard 3 students in Koppal with or without controls for Mathematics in Koppal or Gadag.
- ❖ With respect to Control Variables - not all controls are significant irrespective of location and standard. Only variable which is consistently significant, though against our hypothesis, is “BRC distance from School”. A school with greater distance tends to have higher improvement. Occasionally, Minority or OBC have gained more, whereas in some cases, SC and ST have done worse. Occasionally School infrastructure, Family size, or mother’s education have impact – sometimes counter-intuitive.

The following Tables show Results of the econometric analysis.

Table 3.15: Impact of Akshara Intervention on Mathematics Test Scores (Phase 1 & 2)

District		Without controls					With Controls				
		Class1	Class2	Class3	Class4	Class5	Class1	Class2	Class3	Class4	Class5
Koppal	Intervention	14.28*** (3.09)	-2.57 (4.48)	-14.4*** (3.61)	1.09 (3.58)	-12.7*** (2.75)	11.4*** (3.06)	5.39 (5.21)	-12.1*** (3.96)	-3.94 (4.19)	-12.8*** (3.14)
	Interaction	-24.2*** (3.96)	-17.9*** (6.04)	10.98** (4.66)	2.29 (5.16)	1.64 (4.01)	-24.1*** (3.80)	-17.9*** (5.22)	11.22*** (4.43)	2.29 (4.85)	2.41 (4.02)
Ga dag	Intervention	13.37** (5.54)	-4.57 (5.28)	-3.52 (6.29)	-14.1*** (3.97)	-14.5*** (3.29)	-24.17* (14.46)	-32.11** (16.07)	44.89*** (11.77)	-17.2*** (5.20)	-5.65 (4.76)
	Interaction	6.32 (7.36)	1.04 (7.94)	-3.11 (7.50)	17.63*** (5.10)	9.29** (4.50)	6.32 (6.32)	1.04 (6.92)	-2.19 (6.21)	17.83*** (4.76)	9.29** (4.08)

Note: Akshara is a binary variable indicating whether the student belongs to a treatment school or a control school. Figure in parenthesis are standard errors and ***, **, and * indicate significance at 1%, 5%, and 10% levels respectively; yellow cells means positively significance; sky blue cells means negatively significance. All other tables are have same notes..

Source: Estimated from Field Survey Data.

Table 3.16: Impact of Akshara Intervention on Mathematics Test Scores (Phase 3 & 4)

District	Without Controls				With Controls			
	Class 1	Class 2	Class 3	Class 4	Class 1	Class 2	Class 3	Class 4
Koppal	10.07*** (2.941)	5.237 (3.505)	6.275** (3.000)	3.765 (3.500)	10.53** (4.095)	18.46*** (5.206)	4.323 (3.765)	4.592 (3.882)
Gadag	13.88*** (4.210)	-2.720 (4.490)	2.548 (3.833)	-19.12*** (3.786)	8.068 (20.48)	30.54* (18.18)	11.24 (14.69)	-8.907 (6.858)

Dependent Variable: Change in Test Score for Mathematics from pre-intervention to 4th intervention

Table 3.17: Impact of Akshara Intervention on Mathematics Test Scores for each class individually

District	Class 3		Class 4		Class 5	
	Without Controls	With Controls	Without Controls	With Controls	Without Controls	With Controls
Koppal	-7.270*** (2.670)	-11.11*** (3.874)	10.74*** (2.737)	13.47*** (3.741)	4.707* (2.725)	19.91*** (3.397)
Gadag	13.70*** (2.967)	15.33*** (4.782)	26.45*** (3.084)	31.72*** (5.086)	20.14*** (3.841)	34.92*** (6.139)

Dependent Variable: Change in Test Score for Mathematics from 5th intervention to 6th intervention

On the whole, we can say that results show somewhat positive evidence on the role of Akshara intervention on student outcomes. We find that intervention has led to an improvement in average test scores for students belonging to certain standards and this effect varies across districts.

3.7 FEW OBSERVATIONS

In sum, if one looks at the Akshara intervention in both the districts, the news seems to be good and encouraging. For example both input and outcome indicators due to such intervention have improved in Akshara schools as compared to the Non Akshara schools. The indicators of Classroom transactions as well as Classroom observations have been better in Akshara schools and they have also improved as the intervention has progressed. Such improvement has its impact on the learning skills of the students which is exhibited by the performance of Akshara students in Mathematics tests which were administered to both Akshara and Non Akshara schools. Out of the total six phases spread over three years, one can observe that by and large Akshara students have

performed better than Non Akshara students. This only brings home the fact that Akshara intervention has served the purpose for which it was initiated. This also supports the argument of scaling up such intervention in other parts of the state.

3.8 RECOMMENDATIONS

The study team would like to make the following recommendations which would go a long way in further fine tuning the intervention for the benefit of the student community.

- ❖ The issue of teacher transfer who are trained by the Akshara initiative has sometimes created irritants in the effective implementation of the initiative. The trained teachers need to be retained in the same place till the intervention is in progress.
- ❖ Another issue with regard to teacher training is that all the teachers in the same school need to be trained by Akshara. Now those who are not trained feel that they have been neglected by this kind of intervention. Time schedule of training and supply of kits need to be in accordance with the academic calendar of schools.

- ❖ The need is also felt to train BRPs and CRPs for effective monitoring of the program. SDMC members also need to be sensitized with regard to such intervention.
- ❖ Usually such interventions would lose the steam as soon as the intervening agency withdraws from the scene. Thus, in-order to sustain the initiative even after the exogenous factor withdraws; the need is felt with regard to use the trained teachers as trainers for training the other teachers. This would help the program to get internalized in the public schooling system.
- ❖ Now the intervention of the Akshara initiative is trying to make a dent into the public education system at the school level. The need is felt in this regard from the Education Department to own this initiative which would give greater mileage to the efforts put in.

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