

## **Assessing Reality Show Contestants - Akshara Ganitha in Kushtagi**



**RESEARCH AND EVALUATION  
APRIL, 2016**

## Acknowledgement

This study was successfully completed due to the efforts and involvement of various individuals. Most importantly, we would like to thank the teachers, community people and SDMC members who took out time from their busy schedule and participated in the survey.

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## Introduction

Teachers play a pivotal role in shaping a child's intellect through knowledge dissemination. In many developing countries, government primary school teachers are equipped only with text books and a curriculum and they limit their forays into vital innovation that can foster young minds. Unlike in elite private schools, government school teachers do not get the opportunity to explore any kind of innovative teaching methods except for their routine, annual teacher training that aims at competence revival. Government school teachers often lack useful skills and other means through which they can make learning more interesting and helpful for children and the teaching experience more valid and meaningful for themselves.

Akshara Foundation, a non-profit organization in Bengaluru, has been implementing a Mathematics<sup>1</sup> programme in government primary schools and has created a mathematics contest for teachers as a part of the program evaluation strategy. Any noble approach loses its significance if it is not revived by further interventions, a constant push towards goals, demand for academic quality, and continuous support. The Mathematics contest created is an attempt to guide teachers to bring creativity into classrooms.

The contest was organized in one of Akshara's working geographies, Kushtagi<sup>2</sup>, to understand the level of competence among mathematics teachers who have been exposed to Akshara's Akshara Ganitha programme for the last 4 years. The objective behind this contest was to motivate teachers and encourage them to practise innovative teaching by using a Math kit provided by Akshara Foundation. The other objective was to build advocacy and disseminate awareness of the Mathematics Programme in the community, the government hierarchy and other stakeholders in and around the selected geography by airing the reality show using the facilities of a local cable TV operator.

### ***Contest Processes***

The contest processes involved four phases mainly:

**Phase One – Registration and entries:** The Akshara team sent registration forms and questionnaire formats<sup>3</sup> to all 220 government primary schools in Kushtagi to invite entries from Mathematics teachers. Participants were also asked to send a video that demonstrated the fundamental operation of *addition* using the Mathematics Programme's Concrete, Representational, Abstract (CRA) steps<sup>4</sup>. The team received 280 entries from these 220 schools.

<sup>1</sup> The Akshara Ganitha – a Math program followed a pedagogical strategy of three stages viz., concrete, representational and abstract in learning mathematics with aid of Teaching Learning Materials designed to help the teacher to cover all the concepts specified in teaching mathematics up to grade 5 taught in government primary schools of Karnataka. The pedagogy was aligned to the Karnataka State Curriculum Framework 2005 and the text books prescribed by the government.

<sup>2</sup> Kustagi is an educational block of Koppal district. Kustagi has 220 government primary schools.

<sup>3</sup> The questions were on the mathematics teaching-learning materials (TLMs) present in the kit Akshara provides to classrooms, pedagogy, classroom management, and Ganitha Kalika Andolan (GKA), which is an Akshara Mathematics Programme, the Government of Karnataka is implementing in six districts in the Hyderabad-Karnataka region of Karnataka.

<sup>4</sup> Teachers were asked to demonstrate how they would do the addition sum,  $356+545$ , using more than one TLM from the Akshara mathematics kit and by following the CRA steps.

**Concrete Representational Abstract (CRA)** is a three step instructional approach Akshara's Mathematics Programme advocates. The first step is the concrete stage (or the 'doing stage'), which involves physically manipulating objects to solve a math problem. This is followed by the representational (seeing) stage. It involves using images to represent objects to solve a math problem. And the final stage is the abstract

**Phase Two - Screening of the entries:** During screening, the team identified only 130 entries with completed videos. The evaluation team decided to exclude the question entries as they felt that answers were reproduced from known sources. All the 130 videos were evaluated by a team of experts and videos of 20 teachers were short listed for the semi-finals, based on concept clarity, correct demonstration of the concept, and adoption of innovations in their teaching method.

**Phase Three – Semi-final round:** In this round, these short-listed 20 teachers were invited to participate personally at a venue in Kushtagi to participate in the quiz round. In this round out of 20 teachers, 6 teachers emerged as finalists.

**Phase Four- Final round :-** In the last round, six finalists were qualified. In the final round all the six finalists had to demonstrate a mathematics concept using one TLM from the Akshara Ganitha kit within the given time. There were three winners and three prizes were awarded. The panel of judges for this round comprised of three experts from the domain.

### ***Timeline of the Contest***

<b>Dates</b>	<b>Responsibilities</b>
21 <sup>st</sup> – 26 <sup>th</sup> December, 2015	Application forms, question formats and requests for videos were sent to schools.
14 <sup>th</sup> January, 2016	Deadline for submission of entries.
15 <sup>th</sup> -19 <sup>th</sup> January, 2016	Screening of entries for semi-final round.
20 <sup>th</sup> January, 2016	Notification to participants who were selected for the semi-final round.
27 <sup>th</sup> January, 2016	Semi-final round.
3 <sup>rd</sup> February, 2016	Final round.

### ***Need for the study***

The recent mathematics competition with the teachers, held in Kushtagi in Januauary-February 2016, crystallised our interest to study the facts which enabled them to come this far. The investigation provided an opportunity to know more about the 20 semi-finalist teachers - about their mathematical knowledge, factors that motivated them, and the role played by them to become winners and set an example for many.

### ***Objectives of the Study***

This study addresses the following objectives:

1. To assess the processes involved in the contest and the motivational factors that prompted teacher participation in the contest.
2. To understand the awareness and perception of parents, members of School Development and Monitoring Committees (SDMCs) and teachers about Akshara's Mathematics Programme and the Mathematics contest.

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(symbolic) stage, which involves using only numbers and symbols. (<http://makingeducationfun.wordpress.com/2012/04/29/concrete-representational-abstract-cra>).

Along with the above, school and teacher background, teacher professional development, classroom transaction and numeracy outcomes of the students were collected to understand the characteristics of each parameters and the connection between each of them.

### ***Sample***

A total number of 20 teachers who qualified for the semi-final round of the contest were selected to be interviewed; however, 25 percent (5 Teachers) of the target group (20 Teachers) were not available during the period of data collection. Other than the teacher sample, a small set of parents, SDMC members and school head teachers were interviewed to understand their level of awareness and perceptions about the need for Akshara's Mathematics Programme and the mathematics contest.

The child assessment was administered to all children of the grades (1 to 3) and sampled children for 4<sup>th</sup> and 5<sup>th</sup> that the teacher –contestant handled.

### ***Sample Distribution***

Teachers	Class-wise sample distribution				
	Nali-Kali	Only 4 <sup>th</sup> class	Only 5 <sup>th</sup> class	Both 4 <sup>th</sup> and 5 <sup>th</sup>	Total
	1	4	2	8	15

Sample category	Sample distribution	Expected sample	Actual sample
Head Teachers	Per School	10	8
Parents	Three parents per school	30	29
SDMC members	One member per school	10	8
Students (Nali-Kali)	Selected schools	-	61
Students (4 <sup>th</sup> )	Selected schools	-	140
Students (5 <sup>th</sup> )	Selected schools	-	135

### ***Team for data collection***

Five teams were engaged to collect data from the 15 teachers who were the semi-finalists of the contest. These 15 teachers were spread across 10 schools<sup>5</sup>. Each team had two members to visit a school to collect data on the respective schools, information on and interview with contestant teacher and school HM, observation of the classroom transaction, and learning assessment of Math of the students of the concerned grades. Along with this, parents and SDMC members associated with the schools were interviewed to understand their perceptions about Akshara Ganitha programme and Mathematics contest. The investigators were from Akshara's Resource and Research functions as also from the Field Operations team.

### ***Tools used in the Study***

1. School profile
2. Teacher profile, Teacher professional development and perception.
3. Parents' and SDMCs' perception
4. Classroom Observation
5. Math Assessment Tool

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<sup>5</sup> There were multiple entries from some schools.

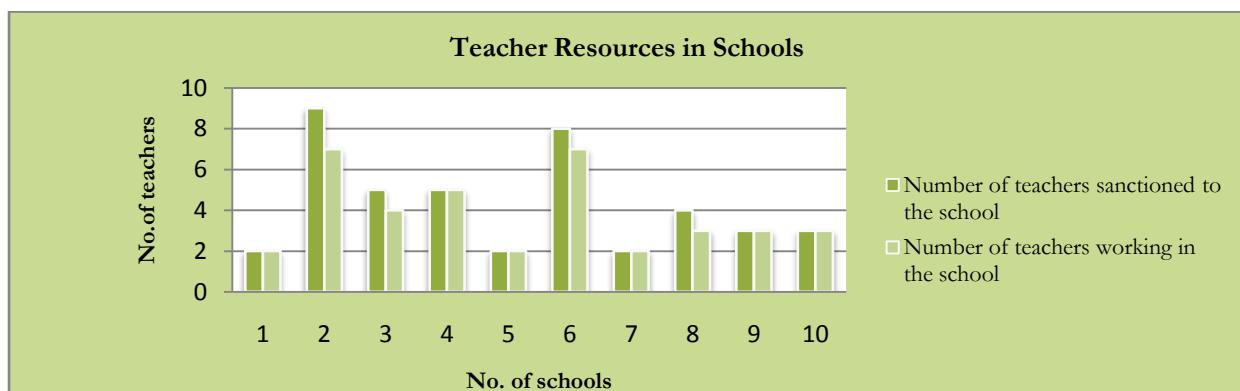
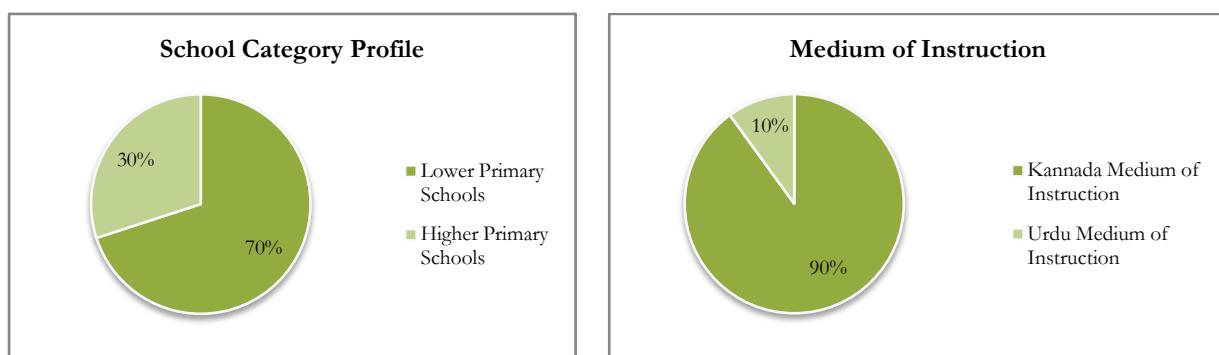
### ***Limitations of the Study***

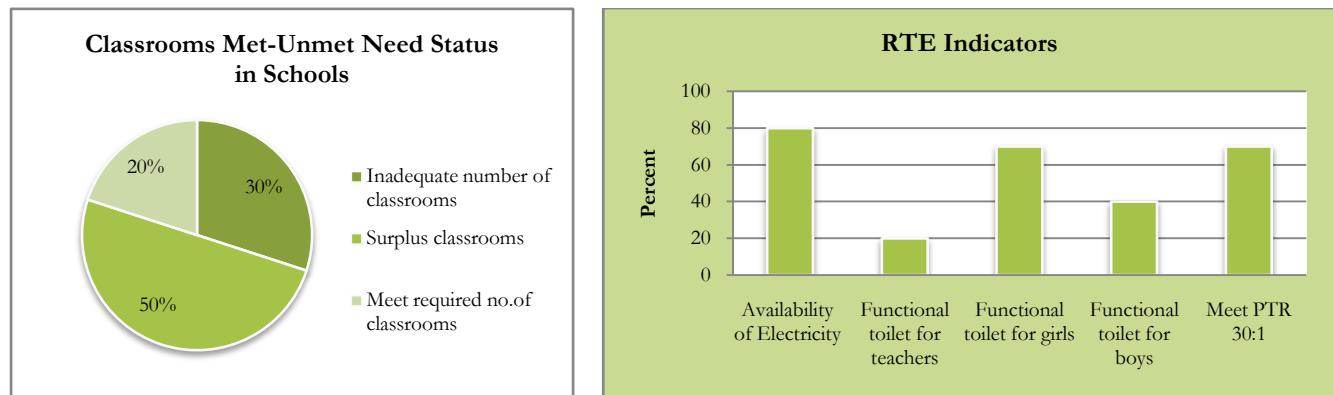
Though requests were sent out to all 20 teachers seeking their participation in the study, around 5 teachers were not available during data collection. In many schools it was found that SDMCs have been dissolved. Poor levels of awareness among parents and SDMC members impacted the objectives and outcomes of the study. Lack of investigative skills among some of the data collectors was a challenge. No statistical correlation test could be established because of the small sample.

## School Facts



During the study data was collected on school environment to get a perspective on the context from which the contestants came from before getting into further investigation. Education researchers envisage that the institutional environment sets conditions for teaching and learning experience. The degree of attention paid to organising the school and classroom environment depends on a school's functionaries. A school's ecosystem consists typically of interactions; support to learning; enhancing the quality of teaching and learning; and nurturing the academic space in the context of children feeling safe, happy and wanted, and of teachers finding it meaningful and professionally satisfying.





Enrolment and Attendance			
Total Number of Girls Enrolled	539	Percentage of Girls Enrolled	53
Total Number of Girls Absent	174	Percentage of Girls Absent	17
Total Number of Boys Enrolled	484	Percentage of Boys Enrolled	47
Total Number of Boys Absent	185	Percentage of Boys Absent	18
<b>Total Number of Students</b>	<b>1023</b>	<b>Total Number of Students Absent</b>	<b>359</b>

- ⇒ Out of 10 schools 7 schools are LPS, 3 are HPS.
- ⇒ Majority of the teacher contestants qualified are from Kannada medium schools.
- ⇒ Schools lack essential infrastructure like separate functional toilets for teachers (18 percent) and male students (38 percent). Seven-tenths of the schools are complied with PTR of 30:1.
- ⇒ One half of the schools has more than the required number of classrooms<sup>6</sup> (*Figure-Classrooms Met-Unmet Need Status*); yet large numbers of schools (70 percent) are practising multi-grade teaching for 4<sup>th</sup> and 5<sup>th</sup> classes.
- ⇒ While comparing teacher resources<sup>7</sup> with Pupil-Teacher Ratio (PTR)<sup>8</sup>, it can be observed that though there is deficit in teachers being allotted to schools; most of the schools meet PTR. It is thus very important to highlight that the number of children enrolling in schools is low, or otherwise children leaving school is high. And the other issue which the data highlights is the number of children in each grade is lesser. This may have also led to multi-grade teaching for 4<sup>th</sup> and 5<sup>th</sup> classes.
- ⇒ Nearly 35 percent of the students were absent on the day of the school visit. The high student absenteeism can impact learning, if there are no remedial classes in schools and learning support at home is lacking.

<sup>6</sup> Classroom met-unmet need is measured by deducting the total number of classrooms available in schools with the required number of classrooms in the school.

Required number of classrooms is calculated on the basis of the number of grades available in the schools [Example: If a school has 1<sup>st</sup> to 5<sup>th</sup> classes, then the required number of classrooms will be 3, i.e., one classroom for Nali-Kali, one classroom each for 4<sup>th</sup> and 5th].

<sup>7</sup> Teacher sanctioned and teacher currently working in schools.

<sup>8</sup> Here PTR 1:30 is taken into consideration.

## Teacher Professional Development



In research discourse teaching practices is considered as one of the yardstick to improve learning. A study in OECD countries has explicitly concluded learning outcome in any settings is solely dependent on teacher efficiency and how they deliver the best possible instruction to each child<sup>9</sup>.

Teacher efficiency is strengthened through on-the-job trainings. The trainings aim to instruct teachers in content and pedagogy. As part of programme strategy, Akshara Foundation trains government school teachers on Akshara's Ganitha pedagogy using its own training module. This section provides information on the Akshara's teacher professional development.

### ***Teacher Training***

- ⇒ 67 percent of the teachers interviewed have received Akshara's Mathematics training. Out of which, 27 percent of the teachers have attended three consecutive years of Mathematics training from Akshara, 2012-13 to 2014-15, 13 percent of teachers attended two years' training and 60 percent of the teachers attended a single year's training<sup>10</sup>.
- ⇒ The teachers found the trainings good and stated various reasons for it.

#### **Reasons stated for liking the trainings**

\*Arrangement of concepts and activities was good.

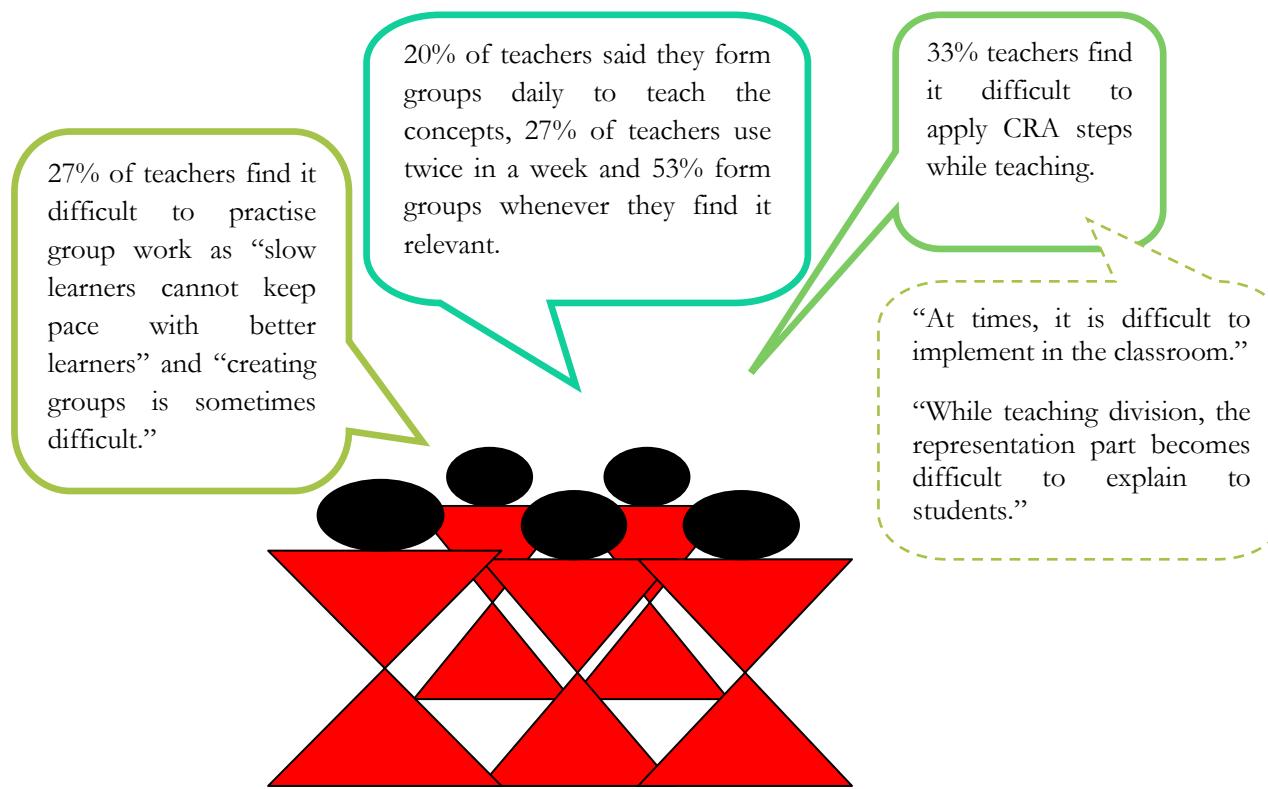
\*Usage of TLMs was specified.

\*Knowledge on concrete to abstract transition was helpful.

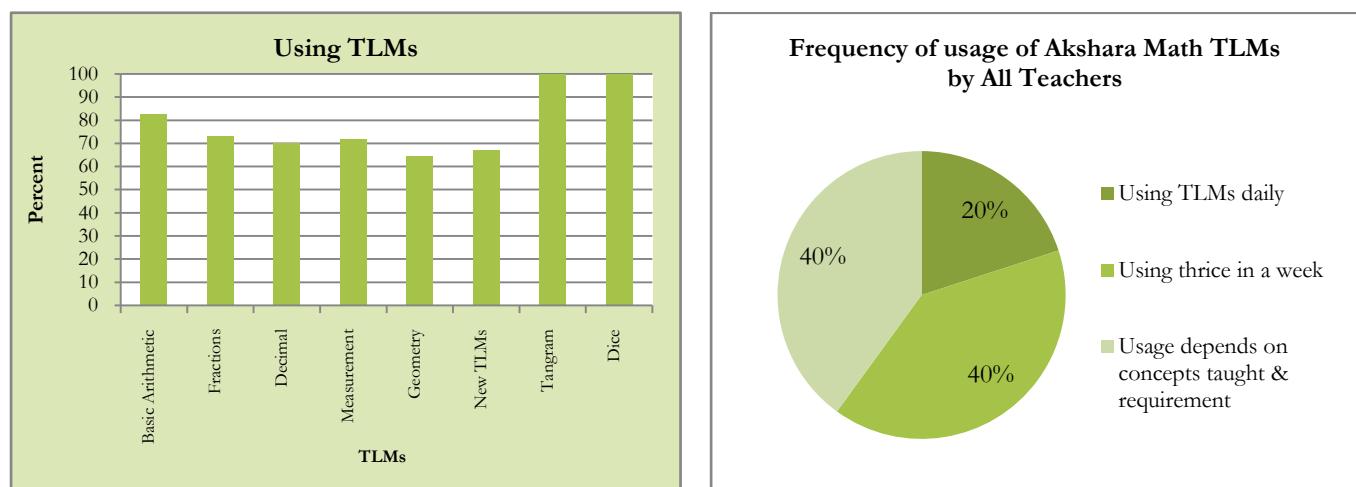
<sup>9</sup> <http://www.smhc-cpre.org/wp-content/uploads/2008/07>

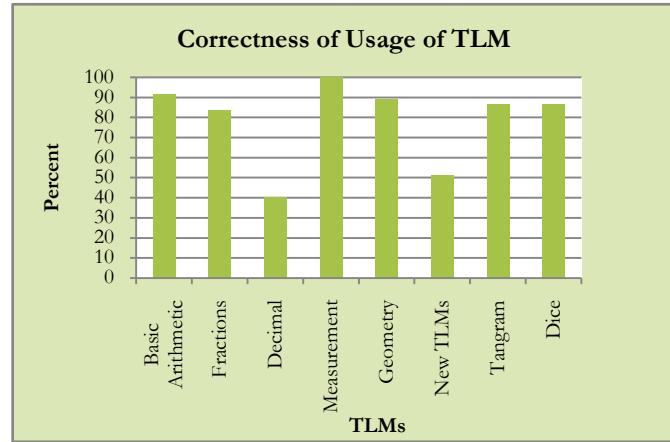
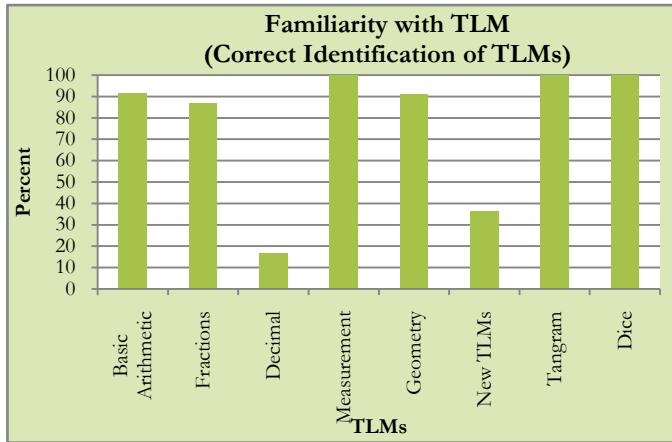
<sup>10</sup> Akshara training was conducted but teacher did not participate.

### Pedagogy Followed in the Classrooms



### Usage and Familiarity of Teaching Learning Material (TLMs)





- It is evident that all the respondents were familiar with the names of the TLMs related to measurement<sup>11</sup>, tangram and dice. However, 23 percent of the respondents were not aware of the correct application of the tangram and dice.  
All teachers were aware of the correct usage of the TLMs related to measurement.  
Familiarity about basic arithmetic<sup>12</sup> TLMs and its right usage was found to be 91 percent and the usage was found to be higher compared to the rest of the TLMs, except tangram and dice.
- Around 87 percent of respondents identified the TLMs related to fractions<sup>13</sup> and 83 percent of them knew the correct usage of the TLMs. A significant number of teachers was found using the TLMs related to fractions. It is interesting to see this trend in the backdrop of teachers' perceptions<sup>14</sup> about the difficulties in facilitating the learning of fractions.
- All the indicators related to the TLMs for decimals<sup>15</sup> showed significantly low scores. This is significant with regard to two aspects:
  - TLMs related to decimals were provided in 2014-15, hence we can assume usage and familiarity of the TLM was inadequate.
  - Teachers perceive that learners face difficulty in understanding the concept of decimals.
- Usage of the geometry<sup>16</sup> TLMs was least compared to all the other TLMs, i.e. 64 percent of the respondents were using these TLMs. However, the percentage of respondents who were aware of the correct usage of TLMs was 89 percent.
- Only 36 percent of the respondents were able to identify the newly supplied TLMs<sup>17</sup> in 2014-15.

<sup>11</sup> TLMs related to measurement are: Clock, weighing balance, measuring tape and play money.

<sup>12</sup> TLMs related to basic arithmetic are: Counters, base ten blocks, place value strips, play money, abacus, number line and place value mat. Basic arithmetic includes competencies like addition, subtraction, multiplication and division. It does not include fractions and decimals.

<sup>13</sup> TLMs related to fractions are: Fraction strips and fraction shapes.

<sup>14</sup> Earlier field experiences.

<sup>15</sup> TLMs related to decimals are: Decimal set and decimal place value strips

<sup>16</sup> TLMs related to geometry are: Protractor, geoboard and geo solids with nets.

<sup>17</sup> Newly supplied TLMs in 2014-15 were: Decimal set, decimal place value strips and geo solids with nets.

### Synopsis

- ⇒ Considering the fact that the respondents were from the creamy layer of teachers selected as semi-finalists for the contest, their familiarity with the TLMs *was reasonably good for those related to arithmetic, fractions and geometry.*
- ⇒ It is encouraging to see that teachers were familiar with the TLMs related to fractions. This is important since teachers generally feel that facilitating the learning of fractions is difficult.
- ⇒ We need to put in more efforts to familiarise teachers with all the TLMs. Since we have less teacher training days, Cluster Facilitators need to spend quality time with teachers.
- ⇒ Data pertaining to some TLMs seems to be inconsistent; for example, the frequency of usage of the tangram and dice is shown as 100% in contradiction to the classroom observation that states that these TLMs are only sporadically used.
- ⇒ One limitation of this data is that it cannot be used to generalize the use of TLMs during the actual classroom process.

### Teacher-wise Knowledge of Competency

Sl.No	School Name	Teacher Name	Identifying TLMs (in %)	Knowledge of Competency (in %)
1	GKLPS Ryavanaki	Savitha Maleda	95	100
2	GKLPS Malakapura	Basavaraju Rodda	89	100
3	GKHPs Menadal	Raghavendra	95	95
4	GKHPs Topalakatti	Eranna Patil	95	95
5	GKLPS Navanagar Dotihala	Angadi Geethamma	89	95
6	GKHPs Hanchinal	Shankarappa Tengunti	89	89
7	GKHPs Gotagi	Asha Devi	89	89
8	GMHPS <sup>18</sup> Dotihal	Bibi Jan	89	89
9	GUHPS Dotihal	Sameena	84	84
10	GKLPS Shariff Nagar	Geetha L Basarkod	74	84
11	GKLPS Shariff Nagar	Amrutha R	79	79
12	GKLPS Hesarura	Ananda Gouda Patila	79	79
13	GUHPS Dotihal	Rizwana Nikhat	79	74
14	GKLPS Umali Rampura	Shekarappa P	74	74
15	GKLPS Nadavalakoppa	Sharana Gowda Patil	79	58

The above table reveals the teacher-wise knowledge of competency and represents the names of the 4 finalists (highlighted rows in the above table). Among these 4 teachers 2 were the winners – Eranna Patil and Geetha L Basarkod<sup>19</sup>. One can observe that the percentage of scores obtained by the other participants were higher than compared to the winners of the contest. This may be due to the first time experience on the stage, lack of confidence or may be due to time constraint.

<sup>18</sup> Government Model Higher Primary School.

<sup>19</sup> There were six finalists and three winners. One of the winners and a finalist were not part of the study.

### Teacher Feedback and Suggestions on Akshara's Mathematics Programme



All teachers said the intervention was required.

**Reasons:** 1. Colourful and attractive TLMs -students take more interest, 2. Can solve math problems which were earlier difficult, 3. Helps in conceptual understanding by using specific concept-related TLMs, 4. Teaching and learning has become easier. 5. Math fear of students has reduced.

"Volume and measurement concept materials were provided and it became easier to teach."

"Carry over addition, subtraction, fractions were difficult to solve earlier."

73 percent of teachers gave suggestions to improve the training.

**Suggestions:** 1. Need more training days, 2. Need training on CRA, 3. Some expert resource persons should also give training, 4. Should extend the programme services to upper primary classes, 5. Need simpler TLMs to teach multiplication and division.

## Classroom Transactions<sup>20</sup>

### Classroom environment



- About 88% of the classrooms were spacious, and 97% of the classrooms had blackboards that were accessible to children.
- 58% percent of the classrooms had displayed charts related to children's activities, multiplication tables and geometrical shapes.
- 69% of them had displayed the Akshara Ganitha kit in the classroom on the day of the visit.
- 43% of the classrooms had TLMs other than the Akshara Ganitha kit.
- Average time taken by the teacher to conduct a class on the day of the visit was 33 minutes.
- Most of the children were seated on the floor and the majority, about 60%, were sitting in rows and 33% were sitting in a circle. 63% of the classes were gender mixed.
- 50% of the classrooms had displayed timetables.



### Activities conducted in the classrooms

- All the teachers were using the blackboard while teaching. About 80% of the teachers were instructing children to solve the problem on the board and asking them oral questions.
- Almost 50% of the teachers gave writing work to the children on the day of the visit.
- The teacher was focusing mainly on individual activities on the day of the visit.
- Only 23% of the children, a low percentage, were asking questions to their teacher.
- About 50% of the teachers used real-life examples to explain a concept.



### Teacher pedagogical methods

- \* Teachers' use of cooperative teaching methods through -group activities was only 20%, group activity and direct teaching were 43%, 57% of the teachers were using the direct method of teaching without conducting any group activities.
- \* 63% of the teachers were treating children equally and were found to possess a good conceptual understanding of mathematics.
- \* Only 50% of the teachers were enthusiastic about teaching.
- \* 69% of them were willing to take a class during the day of the visit.

<sup>20</sup> The section 'Activities conducted in the classroom' can be ignored because of the duration of the data collection. The current data may not coincide with daily activities.

Related to group activities: Teachers in their daily routine follow group activities while teaching (as informed by the teachers), however on the day of the visit some teachers followed individual activities.

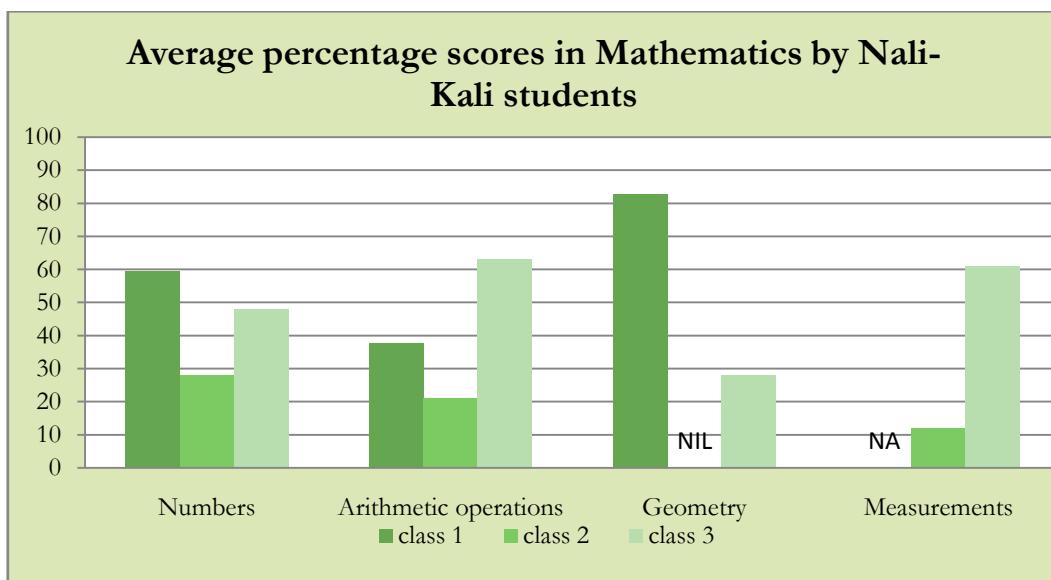
***Observer's Comment about Teacher's Competency and Methods of Teaching***

1. Teacher taught the concept of measurement and made the children understand by quoting many real-life examples. She asked children to measure benches, doors, windows and books. She gave them a few problems on the board and asked them to solve it.
2. Teacher had prepared her lesson and taught with confidence using the CRA method. It was the best class they had seen, noted the observers. All children were involved in group activities using Akshara's TLMs.
3. Teacher taught the concept of time by making children develop a perception of time – seconds, minutes and hours, days and years. But when it came to applying it to the lesson being taught, she was not able to make them understand.
4. Teacher is found to be in alignment with his students. He gave a few exercises to the children. He formed two groups, one with base ten blocks, the other with currency notes, to do multiplication. The children solved the problems using both the tools. But they are more comfortable with currency notes to do multiplication.
5. Teacher seems to have done good work in mathematics because the children could solve many of the problems fluently.

## Child Assessment<sup>21</sup>



The children assessment was done to understand how well students are learning under the supervision of the Akshara Mathematics teacher contestants.



Source: Data was collected during the study visit.

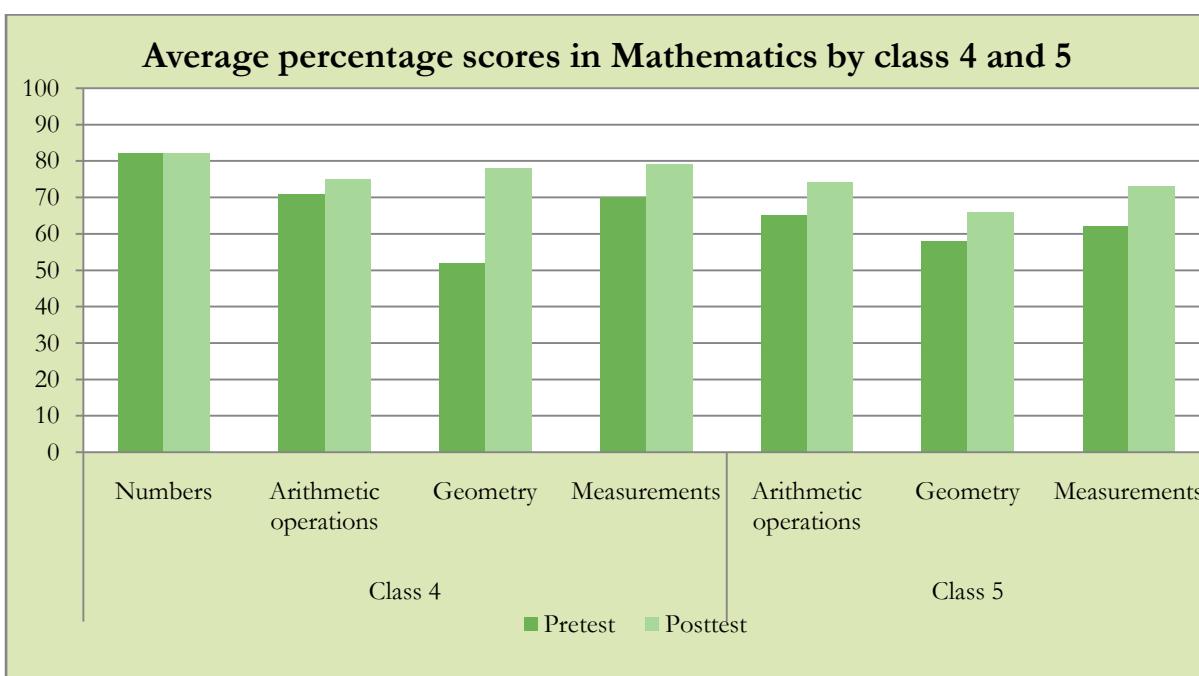
<sup>21</sup> The assessment for grade 1 to 3 was done by Akshara's research and resource team during the field visit for the current study in February 2016. The data provides student scores for one time. Whereas, the student assessment scores of 4<sup>th</sup> and 5<sup>th</sup> were used from the Akshara's census data bank. The data by Akshara is collected twice in an academic year (in the beginning and end of the academic year) by Akshara's Cluster Facilitators. The beginning of the academic year test scores is called as 'pre-test scores' and the end of the academic year as 'post-test scores'.

**Assessment- grade 1<sup>st</sup> to 3<sup>rd</sup>**

Children of class 1 were good in geometry, but have scored less in arithmetic operations. Children of class 2 could not solve geometry and measurement problems at all. Class 3 children have scored high marks in arithmetic but less in the number concept. Overall, the performance of class 2 is very poor when compared to classes 1 and 3.

**Assessment – grade 4<sup>th</sup> and 5<sup>th</sup>**

Major improvements in children of class 4 from pre-test to post-test are in geometry, a rise of 26 percent. Children of class 5 have scored better in measurement, recording a gain of 11 percent.



Source: Akshara's Census Data Bank (Pre-Post tests) 2015-16.

## Teacher Contest Preparation

The majority of the teachers started preparing for the contest from the time they were intimated about it by Akshara's Cluster Facilitators and their school Head Teacher. However, there were some teachers who could not manage their time for preparing for the contest, some of them spending less than a week on it.

Process of Preparation	Problems faced during preparation	Confident of getting selected	Motivation factor	Supported by
<ul style="list-style-type: none"> <li>*Regular usage of Akshara TLMs and pedagogy in the classroom.</li> <li>*Revised and practised the TLMs and referred to other textbooks and the internet.</li> <li>*Followed strategic planning and practised time management.</li> </ul>	<ul style="list-style-type: none"> <li>*Making videos was a problem because of less shooting time and unavailability of video recorders.</li> <li>*School functions disrupted the process of contest preparation.</li> <li>*Inadequate time for preparation and practice.</li> <li>*Participants had time only to study the Akshara Ganitha TLMs and nothing else.</li> <li>*Unsure about the questions that would come in the contest.</li> <li>*Lacked confidence to use TLMs on the stage, though regularly using TLMs in class.</li> </ul>	<ul style="list-style-type: none"> <li>*70 percent of the teachers who were confident of getting selected for the contest stated the following reasons for their level of confidence:</li> <li>i. Regular usage of Akshara's Math TLMs.</li> <li>ii. Longer teaching experience in mathematics.</li> <li>iii. Belief in their knowledge of mathematics.</li> </ul>	<ul style="list-style-type: none"> <li>*Regular usage of Akshara TLMs has increased confidence.</li> <li>*Knowledge of mathematics.</li> <li>*Support and encouragement from Akshara's Cluster Facilitators, school and family.</li> <li>*Found the contest a good opportunity to represent school.</li> <li>*Good opportunity to improve theirs and their students' knowledge.</li> </ul>	<ul style="list-style-type: none"> <li>*47 percent of the teachers said they received support from their families, schools, and Akshara's Cluster Facilitators.</li> <li>*53 percent of the teachers said they have received support from single source.</li> </ul>

### ***Post-Contest Impact***

After the contest, teachers are taking more interest in knowing difficult concepts in mathematics and sharing information about it with students. A teacher said, "There was a question on demonstrating the pattern of tangram and I could not do. I have received training on it from Akshara, and I also use it sometimes in class for teaching portions of geometry, but still I could not answer. So when I got back, I started learning more on the usage of tangram. I also could not identify the names of the famous mathematicians. Now I have made a chart (*shows the chart*)

on famous mathematicians and have displayed it on the classroom wall to teach my students about their contributions. For follow-up, I give exercises about each mathematician to students,”

“5 E CRA step<sup>22</sup> was difficult to explain at the contest time. I am focussing more on it now and I need further training on it.” – reported by a teacher.

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<sup>22</sup> 5 stages of using CRA: Engage Explore, Explain, Elaborate and Evaluate.

## Awareness and Perceptions of Head Teachers, Parents and SDMC Members about Akshara Ganitha Programme

Akshara Ganitha Programme (AGP)			
Variables	HMs	Parents	SDMC members
<b>Aware of AGP</b>	100 percent	24 percent.	***
<b>Math kit used in Classes</b>	75 percent usage in 1-5 <sup>th</sup>  25 percent usage in 3rd, 4th and 5 <sup>th</sup>	***	***
<b>Number of teachers trained<sup>23</sup></b>	70 percent schools= 2 or more teachers trained  30 percent schools= Single teacher trained	***	***
<b>Need for intervention</b>	***	31 percent of those who were aware of AGP said there was a need for intervention for reasons stated below:  i.Has helped in improving children's interest in learning mathematics.  ii.Teachers are teaching with a lot of excitement now.  iii.Has helped in improving knowledge and skills of both teachers and students.	62 percent said there was a need for intervention for reasons stated below:  i.Learning has become simpler now.  ii.Without learning materials, it was difficult for teachers to explain many concepts.
<b>Changes observed in students' performance post intervention</b>	*Learning happily.  *Improved in arithmetic.  *Individual participation is better now.	*Learning happily.  *Children can solve many mathematical problems without difficulty.	*Learning happily.  *Children can solve many mathematical problems without difficulty.

\*\*\*Question was not asked.

<sup>23</sup> Out of 15 teachers interviewed 10 received Akshara Mathematics training.

## Awareness and Perceptions of Head Teachers, Parents and SDMC Members about Most Innovative Math Teacher Contest



Most Innovative Math Teacher Contest			
Variables	HMs	Parents	SDMC members
<b>Awareness</b>	***	28 percent. The awareness level is low because of inadequate contest promotions.	50 percent. The awareness level is low because of inadequate contest promotions.
<b>Source of information</b>	***	From own child studying in the school (from where teachers participated), through television, Gram Panchayat members, and from their place of work (school).	School teacher, child
<b>Watched the contest on television</b>	***	21 percent watched. Low viewing because the show was broadcast in specific villages.	12 percent watched. Low viewing because the show was broadcast in specific villages.
<b>Contest utility</b>	Good opportunity for teachers.	34 percent of those who knew about the contest said it is useful as it increases the knowledge levels of teachers and children, and teachers get better motivated to expand their teaching scope.	75 percent of those who knew about the contest said it is useful as it encourages teachers to take more interest in the subject.  People will know about the teachers who participated, from which school they are, and how they are teaching.
<b>Kind of support extended to teacher who participated</b>	<ul style="list-style-type: none"> <li>*Helped in practising.</li> <li>*Encouraged teachers.</li> <li>*Gave training on Akshara TLMs.</li> <li>*Helped in making the videos.</li> </ul>	***	***

\*\*\*Question was not asked.

## Summary

The study reveals the following facts:

**School related:**

- i. Focus on improving academic issues is lacking in most of the schools. Practising multi-grade teaching in most grades, other than in the Nali-Kali grades of 1-3, and absenteeism are the issues that can affect academic performance.
- ii. Linkage between schools and the community is not strong enough. This is evident in the responses from parents and SDMC members.

**Akshara Ganitha Programme (AGP) related:**

- i. The need for the programme intervention is highly felt by teachers as compared to parents and SDMC members.

The reason behind the low preference for the intervention by parents is due to their low-involvement in school related issues.

- ii. According to teachers, the programme has improved interest and participation in learning mathematics among children and the learning curve has also seen changes.

Parents and SDMC members, who are clear about the vision of the programme, have a blurred idea about the outcomes of the intervention.

- iii. The participation by teachers for Akshara Mathematics training has not been regular.
- iv. TLMs and CRA pedagogy has helped teachers in concept clarity. However, at times CRA steps are difficult to implement because of the time it requires for engaging students.
- v. Demand for more training days and further need of specific concept based training by teachers.
- vi. Demand for better resource person for training by teachers.

**TLMs and Pedagogy related:**

- i. Frequency of TLM usage varies among teachers and implementing the right pedagogy is at times difficult, as articulated by teachers.
- ii. Familiarity with difficult concepts such as fractions and geometry is high; however, some teachers still struggle to use Akshara's mathematics pedagogy in an appropriate way.

### **Classroom Transactions:**

- i. It is found that in a few schools, the availability of Akshara TLMs<sup>24</sup> and other TLMs is an issue. In another circumstance, it is surprising to find that a teacher gives easy access to his students to take TLMs home<sup>25</sup>.
- ii. Whether the teacher is well-prepared and uses cooperative methods while teaching is ascertained from classroom observation.

**Children's Learning Levels:** Scores have improved by the end of the academic year (4<sup>th</sup> and 5<sup>th</sup>), but no major difference could be noticed in some specific concepts such as numbers and arithmetic in class 4.

### **Math Contest related:**

- i. Teacher's did not get sufficient time to prepare for the contest, had limited knowledge about the contest format and faced difficulty in organizing the contest video; but all of these did not de-motivate them to participate in the contest. Their willingness to participate in the contest was high.
- ii. They were confident, motivated and contest preparation process was easy because of the regular usage and familiarity with the Akshara TLMs.
- iii. The participants received good support and guidance from school HMs and colleagues, families and Akshara Cluster Facilitators during preparation for the contest.
- iv. The awareness level about the Mathematics contest was low among parents and SDMC members.
- v. Along with teachers, school HMs, parents and SDMC members found the contest to be a good opportunity to improve their knowledge about mathematics and make people aware about their teaching skills.
- vi. The contest promotion outreach had lesser awareness impact on the community.
- vii. The contest contributed to higher levels of knowledge and interest among teachers (post-contest impact). Teachers are working to improve on their concept weaknesses and its application.

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<sup>24</sup> TLMs were not displayed at the time of visit. It is usually taken out whenever the class needs it.

<sup>25</sup> Through discussion with teachers.

## Conclusions

The Math Contest for teachers created the necessary environment to think about the relevance of the Akshara Mathematics programme and related training among the teachers. Post contest, there is higher need for specific concept-clarity support from Akshara to teachers for strengthening their mathematical skills. The contest also targeted advocacy for the community and local education authorities but the impact is poor on them because of the weaker outreach of the contest promotions and disconnection between schools and community.

A number of teachers had difficulties in preparing for the contest due to inadequate time and lack of contest related resources. Participants familiar with the Akshara Ganitha kit had stage fear and could not do well. The contestants also shared their views that demonstrating some concepts was difficult at the contest spot and lacked innovativeness while demonstrating. Thus, it is important for education stakeholders to embrace innovations in professional development of teachers and equip cluster education resource centres with inputs related to the subject and allied activities. The above situation also calls for Akshara to re-look into the design of the contest for future endeavours to avoid disputed feelings among the participants.

Familiarity and correct usage of Akshara Ganitha TLMs enabled teachers to qualify for the semi-final round but by following multi-grade teaching for 4<sup>th</sup> and 5<sup>th</sup> grades, teachers are drifting away from the core of the Akshara pedagogy. This may have also resulted into slower improvement in learning outcomes (*Figure- Average percentage scores in Mathematics by class 4 and 5*).

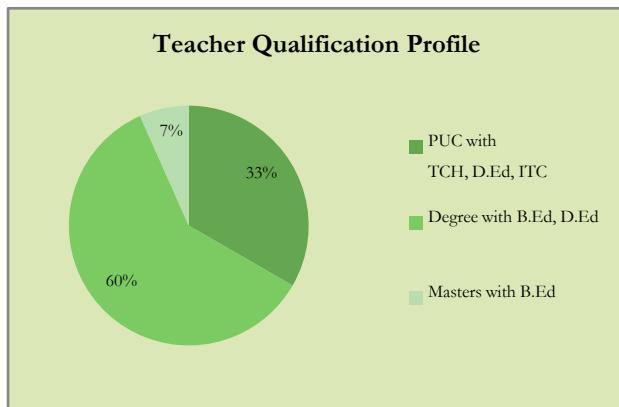
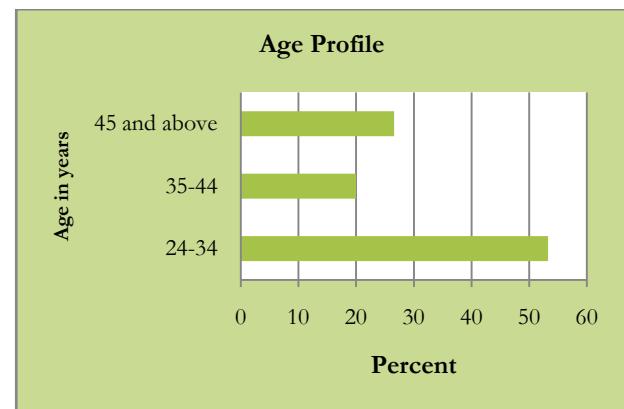
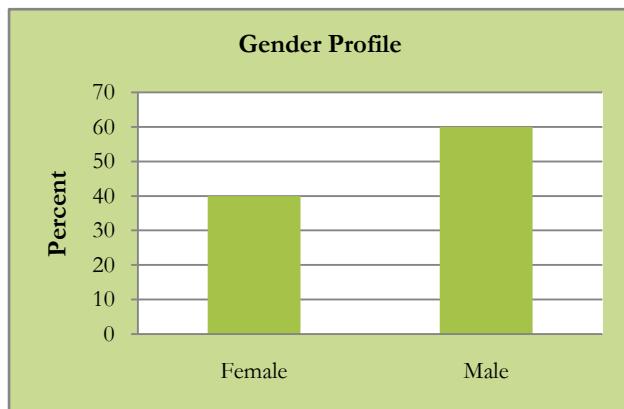
## Recommendations

1. The findings show that the teacher training given by Akshara is not sufficient and Akshara may want to evolve mechanisms of covering all teachers of the coverage area.
2. There is need for consistent effort to motivate teachers to participate regularly and actively in trainings.
3. It is clear from this quick turnaround study that stakeholders are not informed well about the activities “in-side the school” in general and completely ignorant about the events like ‘Reality Show’. Therefore, a systematic ground work has to be planned and implemented prior to launching of any such events. The focus on the community and other stakeholders must be intensified to improve awareness about school issues.
4. Outside-curriculum activities for teachers are usually lacking in government schools. Reality show seems to be a motivator and energizer among the teacher community which is bogged by daily routines. Events like this may keep the know-how on the program alive. However the event has to be designed for a longer time period so that teachers may be motivated to get latched on to the program.
5. The response from the stakeholders on the awareness of the program is poor and therefore it suggests that the promotional strategies around improving the awareness of the local needs to be designed carefully to get higher return on investment. Enough homework has to be done about what works in the most remote rural areas so far as spreading of information on such shows. Selection of Telecasting of events in local channels should be based on factors like wider outreach.
6. Pre- launch awareness building is equally important and strategies should be evolved around that. The planning and timing of such events should not impede school activities.
7. Strategically planning this kind of event may have higher impact on the usage of the TLMs by the teachers. Announcement of time of the event should be spaced with the time of main event to experience the impact. Design of the contest may have to be re-looked.

## ANNEXURE

### Teacher Profile

The team could interview 15 teachers out of the total of 20 finalists for the study. The teacher background data reveals the following facts:



Indicators	In Percentage		
Subject specialization	Math*	Not studied Math	
	40	60	
Overall teaching experience (in years)**	5 years and below	6-10 years	11 years and above
	7	67	20
Math teaching experience (in years)	5 years and below	6-10 years	11 years and above
	33	47	20
Respondent's Monthly expenditure (Rs)**	10,000-15,000	15,001-20,000	20,001 and above
	20	27	47
Commuting mode and distance from home to school	Mode of travelling		
	Walk to school	Two-wheeler	Auto/Bus
	2	47	27
	Distance of travelling		
	5kms and below	6kms and above	
	53	47	

**Note:** \* The teachers have studied math along with other subjects for their graduation. In Karnataka, three subjects are studied for graduation and each subject has equal weight.

**\*\*** Do not sum up to 100 percent because of missing values.