

Technology based learning assessment in Ganitha Kalika Andolana

Objective:

Akshara Foundation is implementing a large scale Math learning Movement, Ganitha Kalika Andolana for improving the math learning outcome among learners of class 4 and 5 of Government schools of Karnataka. It is implemented in partnership with education department of Government of Karnataka. One of the expected outcome of Ganitha Kalika Andolana is to improve the math learning outcome by at least 10% points compared to results of ASER-2104. Akshara Foundation along with EkStep has developed an Android based App for assessment of Math learning outcomes. App is designed with the main objective of measuring the basic arithmetic competencies for class 4 and 5.

About the App:

- Minimum system requirement for the App to run is Android 4.4.4 version with 4.5 inch screen size.
- Have 10 questions, which are common for class 4 and 5. Whereas class 5 will have additional five questions.
- Where ever necessary, App has the voice over for instructing the assessee.
- Test can be administered offline and the data of the assessment will be synced with server when assessor comes online.

Test items in App:

Objective of Ganitha Kalika Andolana is to improve the math learning outcomes by 15 percentage points compared to results of ASER, 2015. ASER measures basic arithmetic skills like number recognition, subtraction and division. Hence, some of the test items in the App are similar to the ASER test tool. Questions are preloaded in the App and will be randomly selected during assessment. The question ID's and questions are attached in Annexure-1. All the questions will be in Kannada where the numerical are in English.

Following are the questions that are loaded in the App:

- **Q. No 1 and 2: Subtraction of two digit numbers with borrowing. (common for class 4 and 5)**
 - **Mode of answering:** child will key in the answer for the problem displayed. Both answer should be correct.

- **Q. No 3 and 4: Division of 3 digit numbers by a one digit number with reminders. (common for class 4 and 5)**
 - **Mode of answering:** child will key in the answer for the problem displayed. Child has the answer quotient and reminder correctly. Child as to answer both the questions correctly.
- **Q. No 5 Number recognition (common for class 4 and 5)**
 - **Mode of answering:** Screen will display randomly generated 10 two digit numbers with touch sensitivity. Back ground voice to call out a number out of the 10 digits displayed and ask child to touch the number that is called out. This will repeat five times with different numbers being displayed and different numbers being called out. Child has to recognize at least 4 digits correctly.
- **Q. No 6: Place Value - GKA TLM and Number recognition (common for class 4 and 5).**
 - **Mode of answering:** Screen will display a number represented with GKA TLM. Back ground voice asks to recognize the number represented in Kannada. Child has to key in the answer.
- **Q. No. 7 : Division fact (common for class 4 and 5).**
 - **Mode of answering:** Child will key in the answer.
- **Q. No. 8 : Regrouping with money (common for class 4 and 5).**
 - **Mode of answering:** Child will key in the answer.
- **Q. No. 9 : Carry over (common for class 4 and 5).**
 - **Mode of answering:** Child will key in the answer.
- **Q. No. 10 : Addition (common for class 4 and 5).**
 - **Mode of answering:** Child will key in the answer.
- **Q. No. 11 : Decimals (only for class 5)**
 - **Mode of answering:** It is a Multiple Choice Question (MCQ) and child has to selected one correct option.
- **Q. No. 12 : Fractions (only for class 5)**
 - **Mode of answering:** It is a Multiple Choice Question (MCQ) and child has to selected one correct option.
- **Q. No. 13 : Shapes - Relationship between nets and 3D shapes (only for class 5)**
 - **Mode of answering:** It is a Multiple Choice Question (MCQ) and child has to selected one correct option.
- **Q. No. 14 : Area of a shape.**
 - **Mode of answering:** It is a Multiple Choice Question (MCQ) and child has to selected one correct option.
- **Q. No. 15 : Word problem - Sentence based application problem (Only for class 5)**
 - **Mode of answering:** Child has to read the question and key in the answer.

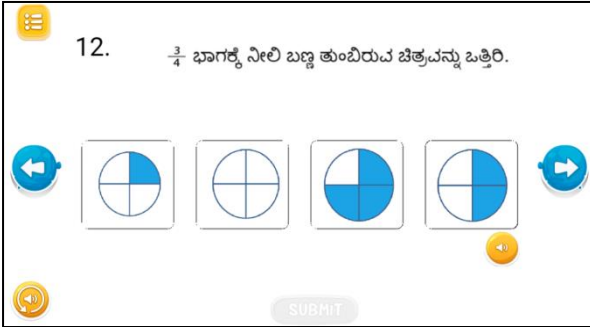
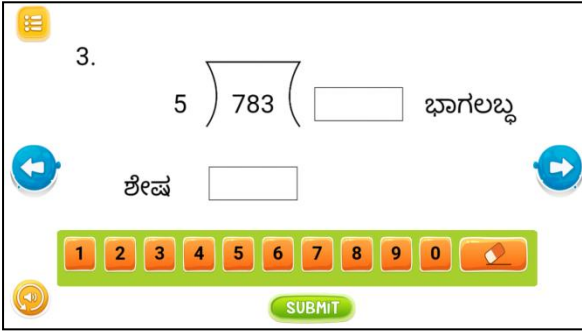
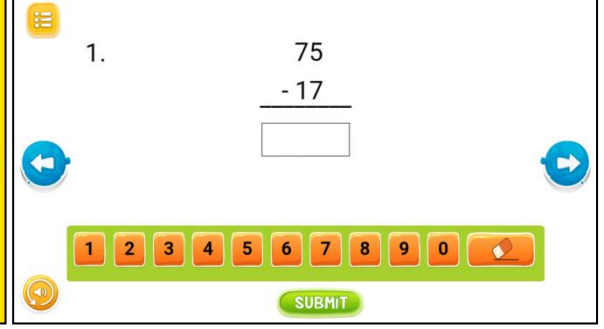
Administration of assessment:

1. Assessor will be Field Co-ordinator appointed by Akshara Foundation for monitoring Ganitha Kalika Andolana program.
2. Assessor will use KLP identification code provided for each school and individual child preloaded in the App
3. Four children each from class 4 and 5 will be assessed during each school visit.
4. Children for assessment are chosen randomly by dividing the number of children enrolled (as per the attendance register) by four.
5. Since each Field coordinator visits two schools per day, it is expected that each Field coordinator will assess 8 children per day.
6. Field coordinator will provide minimum assistance for children for entering the results.
7. Each child may take approximately 30 minutes for completing the test, since the test is administered simultaneously for 4 children at a time, it may take one hour the complete the assessment for children of class 4 and 5.
8. Assessor will repeat the same assessment procedures to the same children who were assessed during his/her earlier visit based on the availability. If the child is not available she/he will choose other child.
9. At the end of completing assessment for class, assessor returns to a place with Internet connectivity and turns on the sync feature of the device. All the data collected so far is synchronized with servers in the cloud. This step is redundant if location has internet connectivity, in which case the data is instantly synchronised.
10. Data will be in encrypted form and will be shared with Akshara Foundation for decrypting.
11. Akshara Foundation decrypts the data and analysis will be done every month
12. Block and district wise reports will be shared with relevant stakeholders including the resource team based in Bangalore and Field coordinators of different blocks and districts for developing necessary strategy for improving the learning outcome.

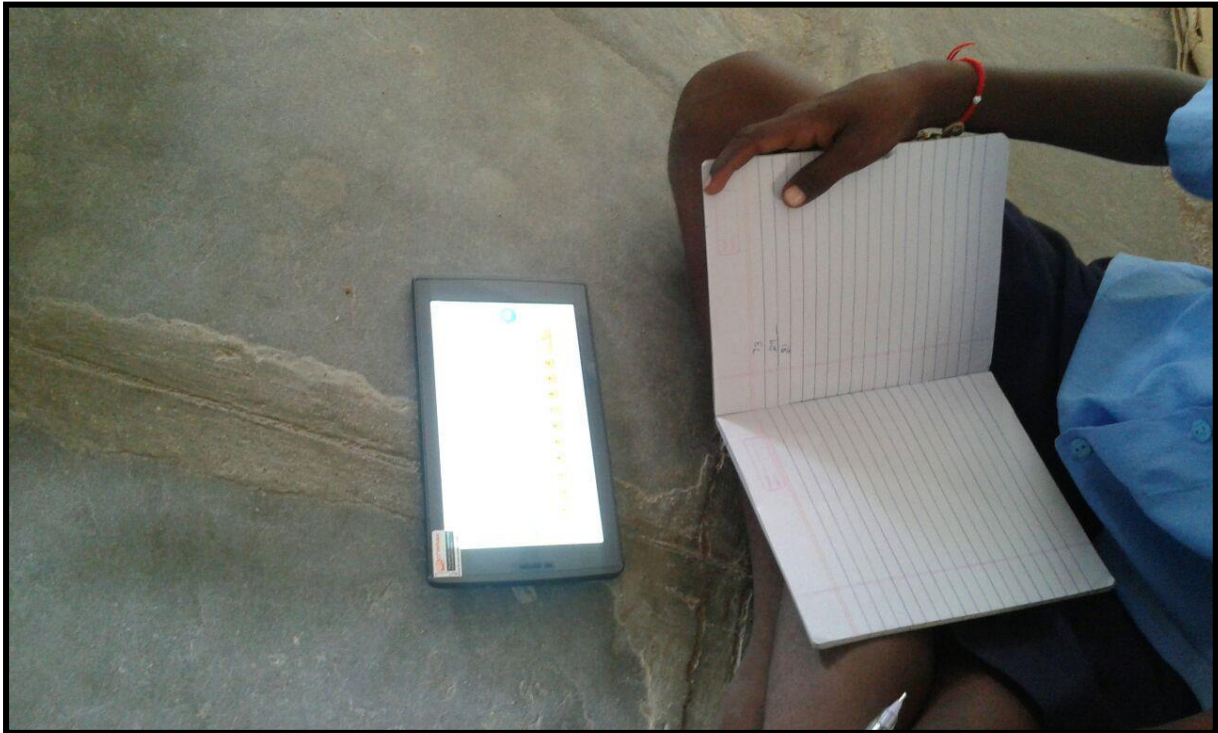
Analysis:

Analysis will be done based on number of correct answers against the number of children assessed for each test items. It will be sliced to district level and block level data to compare the performance of students based on the region.

Some Screen shots of the App



Glimse of administration







Annexure – 1 : Question ID for App

Question Number	Question ID	Question
Subtraction – any two of the following		
1 & 2	akshara.gka.1	23 - 16
	akshara.gka.2	78 - 39
	akshara.gka.3	34 - 25
	akshara.gka.4	47 - 18
	akshara.gka.5	53 - 44
	akshara.gka.6	65 - 19
	akshara.gka.7	53 - 35
	akshara.gka.8	73 - 29
	akshara.gka.9	63 - 27
	akshara.gka.10	43 - 26
	akshara.gka.11	41 - 15
	akshara.gka.12	83 - 28
	akshara.gka.13	91 - 35
	akshara.gka.14	61 - 47
	akshara.gka.15	75 - 29
	akshara.gka.16	71 - 19
	akshara.gka.17	41 - 18
	akshara.gka.18	75 - 17
	akshara.gka.19	97 - 48
	akshara.gka.20	76 - 67
	akshara.gka.21	64 - 46
	akshara.gka.22	58 - 49
	akshara.gka.23	31 - 28
Division – Any two of the following		
3 & 4	akshara.gka.23	769/6
	akshara.gka.24	783/5
	akshara.gka.25	719/6
	akshara.gka.26	673/3
	akshara.gka.27	837/6
	akshara.gka.28	954/7
	akshara.gka.29	897/2
	akshara.gka.30	858/5
	akshara.gka.31	966/8
	akshara.gka.32	926/8
	akshara.gka.33	878/6

	akshara.gka.34	971/7
	akshara.gka.35	757/6
	akshara.gka.36	951/8
	akshara.gka.37	875/6
	akshara.gka.38	621/4
	akshara.gka.39	587/4
	akshara.gka.40	955/6
	akshara.gka.41	896/6
	akshara.gka.42	989/8
	akshara.gka.43	838/7
Double digit – All five will be displayed		
5	akshara.gka.44	56
	akshara.gka.45	89
	akshara.gka.46	34
	akshara.gka.47	99
	akshara.gka.48	60
Place value – Any one of the following		
6	akshara.gka.49	138
	akshara.gka.50	145
	akshara.gka.51	159
	akshara.gka.52	177
	akshara.gka.53	163
Division fact – Any one of the following		
7	akshara.gka.54	6 X 9
	akshara.gka.55	5 X 7
	akshara.gka.56	4 X 8
	akshara.gka.57	6 X 7
	akshara.gka.58	4 X 9
Regrouping with money – Any one of the following		
8	akshara.gka.59	Rs 50 + Rs 50
	akshara.gka.60	Rs 100 + Rs 100
	akshara.gka.61	Rs 20 + Rs 20
Carryover – Any one of the following		
9	akshara.gka.62	123
	akshara.gka.63	489
	akshara.gka.64	568
	akshara.gka.65	286
	akshara.gka.66	464
Addition – Any one of the following		
10	akshara.gka.67	2353 + 1687
	akshara.gka.68	9399+3866

	akshara.gka.69	3464+7246
	akshara.gka.70	7135+9681
	akshara.gka.71	9762+4359
	akshara.gka.72	6599+3452
	akshara.gka.73	8353+5978
	akshara.gka.74	8571+7698
	akshara.gka.75	3214+6887
	akshara.gka.76	8223+6878
	akshara.gka.77	2897+8438
	akshara.gka.78	7689+8534
	akshara.gka.79	6789+8334
	akshara.gka.80	7825+4396
	akshara.gka.81	6472+4839
	akshara.gka.82	7983+3479
	akshara.gka.83	6489+3722
	akshara.gka.84	4827+6494
	akshara.gka.85	8934+3279
	akshara.gka.86	1579+8645
	akshara.gka.87	2578+9684
Decimals – Any one of the following		
11	akshara.gka.88	58.27
Fractions		
12	akshara.gka.89	3 of 4
Relationship between 3D shapes – Any one of the following		
13	akshara.gka.91	Q14 a)
	akshara.gka.92	Q14 b)
	akshara.gka.93	Q14 c)
	akshara.gka.94	Q14 d)
Area of shape – Any one of the following		
14	akshara.gka.95	Q 15 a)
	akshara.gka.96	Q 15 b)
	akshara.gka.97	Q 15 c)
	akshara.gka.98	Q 15 d)
Word problems		
15	akshara.gka.90	Shankar got 48 mangoes from his farm. He wanted it to be divide it between Geetha, Rahim, John and Radha. How much will John get when shankar share it equally with these 4 members?