Asha Kanini Status Report – Aug 2019

Background

This project started in January of 2015 with funding from Oracle. We equipped our teachers with laptops and started providing contents on their laptops. In 2016-17 we also started the role of a computer teacher who will go to multiple schools teaching computer science as well as teach regular subjects using the contents on their computers. We currently have about 25 computer teachers going to about 100 government schools. We also have 40+ regular teachers working in schools. All these teachers have a laptop as well. We are maintaining the computers at all these schools as well.

Right from 2015 we also started putting together content that will be suitable for technology aided education for the TN schools, esp. primary and middle schools. The contents have been mapped to the TN stateboard curriculum. Asha Kanini app was developed to provide an easy access to the mapped contents. We have enhanced the contents and the app over the years.

In April of 2015 we started conducting assessments for children in classes 1 to 5 in all our supported schools. While the initial assessment was a disaster, these have become very reliably conducted assessments over the year. We conduct an oral assessment in Oct/Nov and a written assessment in Feb/Mar every year. We have also started collecting social data about the school and the students. We are performing data analytics with this data.

Our computer teachers teach computer science to classes 1 to 8. Our computer teachers operate in an environment that is very different from typical schools for which computer curriculums are designed. The median school size in rural Tamilnadu is about 40 and most of the small schools have no computers or just one computer. We have designed a curriculum around these limitations. We have started formally putting together these in the form of a curriculum and a series of lesson plans. These are being developed for all the classes.

Our curriculum emphasizes practical application of the knowledge. In this regard we have children from classes 4 and 5 formed into groups and develop a presentation for about 4 months of the academic year from Jan to April. When we first did this in 2016-17, we were ourselves very impressed by the quality of the work from the children and the teachers. We decided to conduct an Asha Impressions competition to recognize and reward the best work. We also decided to have the 7^{th} and 8^{th} std children develop a Scratch

project for the competition. This has been conducted successfully every year since then. Last year some 100 presentations and 15 Scratch projects were submitted for the competition.

Scope of our programme

We cover schools in the following areas:

Thiruvallur Dist (Sangamam)	65
Kanchipuram (Sangamam & Poorna Vidhya)	10
Chennai	5 + Olcott Memorial School
Vilupuram (Thulasi)	7
Thiruvannamalai (Thulasi)	3
Thoothukudi (Pearl)	9

Note these include schools which are planned to be covered this year where we are still hiring the teacher. These schools are covered by about 30 computer teachers and 50 regular teachers. All our teachers have a laptop with an internet plan. Many of these schools have computers of their own. We are maintaining all our teachers laptops as well as computers from these schools.

Infrastructure

Some key developments in this area has been that Tamilnadu Government has given one laptop to every school that has at least 25 students to do their EMIS work (i.e. marking the attendance of their students and teachers). Most of the schools have allowed Asha to install our contents and software on these laptops as well as allowed our computer teachers to use them while teaching.

Asha also received 9 laptops from individual donors. These have been distributed to various schools. We are hoping for some more used computer donations from Trimble and Hyundai Glovis. Most of the schools that we work with these days have computers which enable us to make the most of our computer teachers' time.

Asha Kanini Software

Till the end of 2018, the Asha Kanini software was being developed by just 2 volunteers. From Jan 2018 we brought in two interns who got convered to full time software engineers to work on this software. This has significantly speeded up its development. Several

new features have been brought in and they are being rolled out in a major release of the software in early September.

The new features include the following.

Content Download	The total size of the contents went over 100 GB! Clearly this is difficult to download. Content download feature enables us to ship the software with just the configuration files (for packages where individual contents can be independently downloaded) and download the content the first time it is used. After the first download, the local copy would be used.
Registration	To support free distribution to all schools, teachers can register themselves by identifying their school and email ID or phone number. An OTP will be sent to them. They will then be able to use the application. We have information about who has downloaded our application and how it is being used.
Network & DVD Installation	Till now we could only install by taking an external harddisk with the entire 100 GB contents and run a script to install the necessary contents on a new machine. Now an installer can be downloaded and run to install our software, any third party software required and the contents on a machine. A DVD based installer can also install all the required components.
Improved view of contents	Earlier boring list view of contents has been replaced by a thumbnail view which makes it visually more attractive.
QR Code scanning	Tamilnadu textbooks are coming with QR codes embedded leading user to contents in the Diksha website run by the government. Asha has made most of the Diksha contents locally available. Further the Diksha and other Asha contents for these lessons can also be access by scanning the QR code.
Lesson Plans	On the contents side we have developed lesson plans to help navigate through all the digital contents that are available. This required some special support on the app so that clicking on the contents in the lesson plan can directly open the specified contents.

We have also created a website https://kanini.ashanet.org/ to host the app as well as data related to assessments. The website provides information about the Asha Kanini and its contents. You can download the latest app from the website. Further you can also login to access the assessment details for your school.

Computer Science Curriculum and Lesson Plans

Our computer teachers teach both computer science and curriculum subjects during their time at the school. In curricular subjects, they focus on alternate ways to present topics to develop higher order thinking skills. While doing that they are not restricted to just show something on their computers to the children but also conduct experiments and other classroom activities related to the lessons they are learning.

We have already put together a good collection of contents for classes 1 to 8. We are continuing to enhance the same.

We are teaching the following things in computer science.

- 1st and 2nd standard: Just focus on curriculum subjects. Allow them to play games to familiarize with the use of computers.
- 3rd Standard: Teach them TuxPaint. Also familiarize them with parts of computers, folders etc.
- 4th and 5th Standard: Teach them OpenOffice (Writer, Calc and Impress). Work towards having them show a presentation at the end of the year. Develop understanding of the OS and Windowing environment.
- 6th to 8th Standards: Teach them programming. We start with writing logical instruction sequences for real life and Blockly in 6th std and then transition to programming with Scratch.

Three of our senior teachers have developed the curriculum for all these classes. They are in the process of developing lesson plans to cover the entire curriculum. The lesson plans will come with resources that will be required to implement them as well as videos to explain how to do some activity.

Assessment Data Analytics

For the 2018-19 assessments we started gathering data about the students. The data included,

- Student date of birth.
- Height and weight. The idea is to evaluate if the student is normal, underweight, malnourished etc.
- Details about the preschool education: Kindergarten, Balwadi or none.
- Educational attainment of their parents.

We engaged 3 interns from IIT Madras during the summer to do some data analytics on the assessment data. Based on this one paper has been submitted to the Technology for Education (T4E) IEEE conference titled “Analysis of factors affecting primary school students’ performance”.

We are continuing to do data analytics on this data with volunteer resources. We are hoping to engage on a continuous basis with the IIT Madras and IIT Bombay professors involved with education related data analytics.

For the 2019-20 assessments we are planning to collect the following additional data:

- Attendance at a student level. We do have that data currently but just for the day of the exam. So it may give an OK estimate for the school but for a single student it will not given any meaningful data.
- The grade given to the student by the school.
- Continuity of the student’s education. i.e. When did the student start at this school?

The idea is to develop the data analytics tool required to analyse the data to answer questions such as,

1. Does nutritional level of the student affect his performance? To what extent?
2. Does attending Kindergarten vs Balwadi affect a student’s performance? Do this effect last till the 5^{th} std?
3. Does parents’ education impact a child’s learning?
4. To what extent does factors like student’s attendance, average attendance level at a school, teacher-student ratio, strength of the school and class etc. affect the students and the schools performance.
5. Can we work out a way to eliminate codependent factors’ influence on each other to measure really the impact of a specific factor. For instance bigger schools may perform worse because they also tend to have higher student-teacher ratio and serve a poorer population.

These kinds of predictive and prescriptive analytics can provide good input to public policy.

Internal Uses of Technology

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Asha Chennai uses technology internally to improve the way we are doing our work. We have been using technology for our teacher training for a number of years now. We send our teachers weekly assignments in English over email. They also reply to that by email. Further mentors also conduct weekly spoken English sessions for their teachers.

Leave reporting and salary computation is gradually being automated. The teachers currently report their leaves using a google form which updates a google sheet. We pivot from that sheet to compute the leave details for each month. Plans are afoot to develop our own system that will take the automation further.

Asha Kanini beyond Tamilnadu

While plans are afoot to distribute the Asha Kanini app to all the government schools in Tamilnadu, we are also seeing possibilities of using it in other states. We have started working with the Asha group in Rajatalab to support the government schools in that area. They will be using out curriculum and methodology to teach computer science at these schools. Further we also hope to use them to start mapping the contents available in Hindi to UP curriculum. This will enable us to distribute these contents in UP as well. We have also interacted with AfE supported projects in Rajastan and Chattisgarh. There may be a possibility of NGOs in these states taking our software and putting together the contents and doing the mapping for their state board curriculums.

Next Steps

We hope to hire one more person to the Asha Kanini project to enhance the team further.

Asha Kanini app should be used in more schools in Tamilnadu where Asha doesn’t have any direct presence. Towards this we are hoping to have meetings with the CEO/DEOs of the districts where we have good presence first (esp. Thiruvallur and Thoothukudi). It would also be good to have this be pushed right from the Education Secretary level. We may need to ramp up our training capabilities to effectively reach the teachers at all TN schools. We may seek funding for this as a separate project if this really takes off.

The data analytics work will continue. Hope to do a fairly complete analysis with the existing data be this academic year.