

Pravartak Asha Kanini 2022-23 Proposal

Background

Pravartak

IITM Pravartak Technologies Foundation is a Section 8 company that has been established by IITM to host the Technology Innovation Hub. Pravartak focuses on Translational research in the Areas of Sensors, Networking, Actuators, Control Systems (SNACS) and by incorporating Artificial Intelligence and Machine Learning in its projects

Asha for Education

Asha for Education is a worldwide action group formed to catalyse socio-economic change in India through education of underprivileged children. 'Asha' means hope — the hope that we aim to bring into the lives of these children. Asha Chennai focuses on government school education and digital literacy. We have gained the experience and expertise needed over the years. Asha Chennai is completely managed by volunteers with overhead costs generally borne by the volunteers.

Charity Navigator ranks Asha For Education consistently in the top tier. Asha for Education is also a recipient of the Times of India Social Impact Award.

Technology and Education in Tamilnadu Govt Schools

While there were a couple of false starts in the past with CAL (Computer Aided Learning) centers, there is a concerted push currently in Tamilnadu (and all over India) to enhance learning through technology. However there still are problems in their approach.

The Government of Tamilnadu has started to deliver software for all the lessons through Diksha to the Government Schools. There are QR codes embedded within the lessons in the textbook. When these QR codes are scanned with a mobile phone, it takes them to relevant contents on the [Diksha](#) website.

There are ways to access the same through laptops and smartphone devices as well by visiting the Diksha website. This solution that Diksha provides is a walled garden where the navigation of the material is directed and the selection of material is limited.

The emphasis of the content provided currently under the Diksha platform is passive contents like videos and presentations. In other ways too, the government emphasises passive contents. The main spending on infrastructure at the schools these days seem to be in "smart classes". When you have a single screen for a big class, the way you use it tends to be passive. Research has found passive learning by watching videos is not very effective in furthering education. There are many active contents available like PhET, NLVM, Azim Premji Foundations activities, TuxMath, GCompris, Geogebra, etc. which provide excellent ways for students to learn.

Further Diksha is hosted on a web server. Network availability is often an issue at remote rural schools. While it is always possible for a teacher to download the content ahead of time, this rarely happens in practice. Another key problem at government schools, especially remote rural schools is the maintenance of the infrastructure. HMs of these remote schools struggle to maintain the PCs given to them. Getting maintenance engineers to service these is very difficult. And given the dusty, humid environment they are used in, they develop problems often.

Asha Kanini Solution

Technology in education has become pervasive across the world. The lack of resources in India threaten to diminish our ability to stay current with the changing education ecosystem. At Asha Chennai, we have developed Asha Kanini, a software package that facilitates teaching using the best available content around the world to teach specific concepts to children. There is an abundance of high quality free content available from organizations like Khan Academy, University of Utah, University of Colorado, Azim Premji Foundation and others. PhET is an example of the high quality of the content developed by Nobel Laureate Carl Wieman included in Asha Kanini.

There is no need to deprive students of such quality software when it is available for free. Our Asha Kanini App also works with the QR codes in the textbook and when the QR codes are scanned from within our App, we show them the Diksha contents as well as other contents. Asha Kanini provides most of the contents including the contents provided through the Diksha platform.

These contents are downloaded and locally available. This enables the teacher to use contents of their choice at their school without being constrained by network availability. The software is developed in a language and operating system independent manner and can be ported for any device and also made to support any curriculum.

Asha Kanini has packaged these contents and made it easy for teachers to identify specific passive content like videos for conceptual clarity, active content like games for practice and mastery over a concept and simulations for practical applications. Further we are also developing Kanini lesson plans that explain how the digital contents available through Asha Kanini can be used when teaching various lessons. Kanini lesson plans are already available for Maths, English and Science for classes 1 to 5 for Tamilnadu.

Asha Kanini Features and Contents

Please refer to the appendices for information on the features of the Asha Kanini software package and the contents included in it.

[Appendix I](#) - Contents included in Asha Kanini are listed here.

[Appendix II](#) - Current Features of Asha Kanini.

[Appendix III](#) - List of features we intend to incorporate in the next year.

Current State of Asha Kanini

Asha Kanini is currently available for Windows and Android though it can be easily made available for other operating systems. Current State of the Project Asha Kanini software and packaged contents are available for all schools to use. The

Windows version of the software can be downloaded and installed from our server. The Android version is available for download from Playstore.

Contents have been mapped to Tamilnadu and Uttar Pradesh state board curriculum. All the features and contents listed in the appendices are available and working well. Lesson plans are available for Maths, Science and English for the primary classes in Tamilnadu.

Asha Kanini is already being regularly used at about 130 schools in Tamilnadu and 6 schools in Uttar Pradesh that are currently supported by Asha Chennai. Further in 2021-22 Asha Kanini was installed in about 400 government and government aided schools in Thiruvallur District. It has been installed and is being used by other NGOs and schools as well including Bala Mandir, Olcott Memorial School, TEA trust school etc.

Asha Kanini in 2022-23

We plan to continue enhancing and supporting Asha Kanini as we move to the new academic year. Here are the planned development items for Asha Kanini in 2022-23.

Continued Development of Asha Kanini

Asha Kanini continued development includes the following activities:

1. Move Asha Kanini to the latest React/ReactNative/Node to take advantage of all the new features offered by that.
2. Implement the new features identified in [Appendix III](#).
3. Analysis of Content Usage and the correlation between several factors that affect learning including poverty, malnutrition, parental education, student-teacher ratio and others.
4. Continue to enhance our content offering with specific focus on the Android platform. Towards this end, also provide lesson plans for all subjects-lessons for classes 1 to 8 to make best use of digital resources.

Asha Kanini Training

We have done a pilot project training teachers in about 400 schools in Thiruvallur. We intend to continue supporting them but at this point the hope would be to start the discussions with Tamilnadu Education Department to let them see the results of the pilot and take it to all schools.

We will make a trainer available to support the existing installations and to provide training to schools and organisations that specifically approach us.

2022-23 Asha Kanini Budget

S No	Description	Number	Cost per month/ per person	Yearly Budget	Notes
1	Asha Kanini Lead Developer (loaded cost)	1	50,000	600,000	One more junior developer needs to be hired. Others are already working. This includes bonus, data plan, office space etc.
2	Asha Kanini Junior Developers and Data Analyst (loaded cost)	3	25,000	900,000	
3	Trainers (loaded cost - including conveyance/travel)	1	20,000	240,000	Trainer is already available.
4	Repair costs for devices	500	200	100,000	These are computers available across the schools where we have installed Asha Kanini. We will use the assistance of system engineers from our other projects.
5	Payment for any extra content development.			100,000	We get content developed for Asha Kanini. This may also include payment for extra content work done by our teachers on an hourly basis.
6	Brochure, writing pad, etc. to be distributed during training at other organisations etc..			20,000	Material for conducting training sessions
7	Administration/Miscellaneous Expenses			20,000	Just for contingencies and for basic things like accounting etc.
8	Data plan and repair expenses for Olcott teachers.	8	5000	40,000	Rs 3000 for data plan and Rs 2000 for any repair.
	TOTAL			20,20,000	

Note that loaded cost includes salary, conveyance, sets of uniforms as required, rent if required, yearly bonus etc.

Appendix I - Asha Kanini Packages

Package	Description
Agenda Web	This website is a directory for teaching English and refers to multiple other sites. It has its own simple worksheet like games as well.
Asha Impressions	Presentations made by various school children for the lessons in the textbooks as part of the Asha Impressions competition.
Azim Premji Foundation	Games etc. from Azim Premji Foundation. We do not have everything yet. It may grow by another 50%.
Basic-Mathematics.com	Online Maths games.
Boowa and Kwala Baby games (http://boowakwala.uptoten.com)	Site contains several games suitable for young children that are based on the characters Boowa and Kwala.
Clock	A small application just to teach analog clocks for children.
Cool Math for Kids	The site has good games, manipulatives, brain teasers etc.
Count Us In	A set of simple math games downloaded from ABC Australia. Can be played on the system.
DPE Phonics	Lessons on phonics by state education dept. Relates to the cards that some of the schools have.
E-Speak	Videos on English. Just 4 VCDs.
Easy Teaching	This has very good worksheets and classroom games that we can laminate and distribute to schools. Other contents are not that relevant for us.
Ectal V6	Presentations developed by Lakshmi and her teachers at Olcott Memorial school aligned to TN state board curriculum of 2005-06.
Educative 8	This is a standalone application that provides several educational games.
English Club (www.englishclub.com)	A website with a nice set of games in English.
ESL Games Plus	The site has many games for teaching English, Maths etc. The games are very basic and essentially give a worksheets in the form of a game. But the contents are suitable for the level of our schools and children.
Fun with English	Just 2 lessons in English. Not yet mapped.
FunBrain	A website with nice collection of English and Maths games.
Games to Learn English	Very good games to teach simple English grammar.
Gcompris	A collection of 150 games on Maths and English suitable for primary school children. This is downloaded and installed and thus can be played offline. Note the space required for this is in the system directories and not in our Kanini directory.
Geogebra	This is Maths visualisation tool to visualise all aspects of Maths learning. It also provides a rich programming environment. Many people have developed programs to visualise various topics in Maths.
Hello English	20 lessons in English developed by RIE-SI.

Helpful Games	This has several games for both English and Maths that will help with teaching these subjects.
ICT Games (www.ictgames.com)	A website with a good collection of Literacy and Numeracy games.
JFractionLab	This is a small java based tool just for teaching fractions. It can be used for teaching fractions to children in class 5 and above. It provides several practice sums with visualisation.
Kanini Lesson Plans	For each lesson in our TN textbooks, experienced teachers have put together a list of digital contents that can be used to teach the lesson. This also becomes a single page from which the most relevant content for teaching a lesson can be easily accessed. These are being developed currently for Maths, English and Science.
Khan Academy Tamil	Tamil translation of the video from Khan academy that pertains to primary schools. Need to be checked and updated.
Learn English Kids by British Council	A good set of games by British Council. It has other contents as well.
Manga High (www.mangahigh.com)	Manga High provides good quality animated games to explain Maths concepts. It also has some multiple choice question worksheets.
Math Games (www.maths-games.org)	A collection of online games from maths-games.org. This also provides links to games from other sites.
Math Pickle	Great set of offline games downloaded from www.mathpickle.com .
www.mathgames.com	Site offers lots of different contents on Maths including games and MCQ questions associated with grade / skills.
Math Game Time	The site has many nice games for teaching Maths. Some of the games were a little difficult to understand how to play.
Math is Fun	The website has some very good games as well as worksheets and visualisations tools.
Math Learning Center	This is a free site run by teachers and supported by NSF in the US. They have good lesson plans and worksheets. They also sell these along with the manipulatives required to schools. But even without that their lesson plans are very good. The worksheets that go with it are well designed to teach a concept rather than just provide practice. They also have good manipulatives which may be downloadable.
Math Playground	Math Playground website has a lot of good games for Maths. The videos are difficult to understand because of the English. The word problems are nicely brought to number problem using blocks.
Maths Instructions	Instructions for all lessons from Mrs. Meena Suresh. Tamil instructions for Term II and Term III lessons are still required.
National Geographic Kids	The site by National Geographic has a good set of contents related to science and social science. The games are good, and so are the quizzes. However the level and topics may not be appropriate for our curriculum.
NLVM	A great set of virtual manipulatives for Maths.

One Stop English	A set of English games downloaded and can be played offline. Other contents of the site www.onestopenglish.com have not been mapped.
Owlieboo	It has games similar to GCompris. I guess as a variation, we can use these too. Once our curriculum is ready these can also be mapped without referring to in the lesson plan.
PBS Learning Media	This is a large collection of videos, puzzles and other contents by PBS and its sister organisations. It has several good quality interactive contents as well. The quality of the contents is good.
PhET	An excellent collection of games and simulations for Science and Maths. Unfortunately more suited for middle and high schools. Note the space required for this is in the system directories and not in our Kanini directory.
PSchool.in	This site is intended for a mobile device. It has several exercises suitable for our Indian style of education. The good thing is that it also has contents for Tamil.
Ramanujan Museum	A collection of games and worksheets for the teachers to use in their classroom provided by Ramanujan Museum.
Schoolhouse Bingo	This is a commercial software for generating good educational Bingo games. The package here contains only the generated games and not the software.
Simply English	A good set of audio lessons for children. However the accompanying book for conducting activities is missing.
Smarty Games	A nice set of games to teach Maths and English. This also has audio visual books, flash cards etc.
Soft Schools	Several games related to all subjects and also worksheets and general pages with interesting information etc.
Starfall	The website has a good collection of animated videos for beginning learners on phonics etc. Most of these were available as youtube videos which are shared here. Some extra content is also available only on the website.
Story Weaver	These are softcopies of books including animated and bilingual books from Pratham's Story Weaver platform. These can be used as general English resource by the teachers
Switch Zoo	Unlike other contents that we have. May be useful when teaching about animals, environment etc.
Tamil Academy	A set of lessons mostly in the form of Powerpoint slideshows from tamilacademy.com and noolagam.com mostly for teaching Tam
Tamilnadu Textbook Poems	This is a DVD created by Tamilnadu Government. It contains song adaptations of many of the poems found in the Tamil textbook. The quality of the content is very good.
TN text books	PDF versions of the Tamilnadu Samacheer Kalvi textbooks.
Toon Masti	A collection of animated lessons in English and Hindi developed by Ernst & Young foundation. This is originally mapped to the NCERT syllabus. Many of these can also be mapped to the TN syllabus.
Top Marks (www.top-marks.co.uk)	Lots of good Maths and English games.

Turtle Diary	This website has games, videos (in American English), worksheets etc. The quality of these is also good.
TuxMath	A set of arcade based Maths games from the creators of Tuxpaint. This is also downloaded and installed and can be played offline. Note the space required for this is in the system directories and not in our Kanini directory.
TuxTyping	This is a set of games for teaching children English and typing words on the computer. Note the space required for this is in the system directories and not in our Kanini directory.
Unite for Literacy	AV books like StoryWeaver. May be nice to have in our book shelf.
Youtube Videos	<p>Rhymes and stories downloaded from youtube that are suitable for being played to the children when they have no other activities or in some cases aligned to their lessons.</p> <p>This also contains lessons in the form of videos from several Youtube channels like Kids learning tube, Watch free kids etc.</p>

Appendix II - Current Features of Asha Kanini

Feature	Description
Android and Windows	Asha Kanini currently supports Windows and Android operating systems. Windows download is available on our server and Android installation is through Play Store.
Easy Installation	Asha Kanini software, the contents and the required third party software can be easily installed using a network or Perdrive installer (for Windows). The network installer is only 50 MB. Further download of the contents is under 1 GB.
Registration	Teachers select the school they will be using the software from and we validate their identity using their email ID or their phone number. Non-teachers can register without selecting their school name.
Support for Contents	Handles all content types required by the contents in these packages. Required third party packages for viewing the contents are also installed along with Asha Kanini. Lesson plans are special contents which provide access to the other contents in Asha Kanini. These are also supported.
Easy Search and Access	Allows for searching the contents by class, term, lesson, subject and package name. These criteria can be used in any combination. Also allows for searching the contents for a lesson by scanning the QR codes from the textbook or by typing the Diksha code embedded in the QR code. You can also directly reach the content by searching for it using tags.
Network Independence	Network is required only during initial registration and for the first download of content that is not available locally. Shows contents that require network greyed out if network is not available. Operation with local contents will not be disrupted in any way by network unavailability.
Language Independence	Support for Unicode titles, file names, descriptions etc. The content can appear in any language on our Asha App UI. The button and menus in the UI itself are for now only in English.
Usage Monitoring	Every time a user starts the app, searches for a content, opens or closes a contents, a usage record is stored in the server. This is combined with a sophisticated UI for accessing the usage data and glean important information from the same. Access control supports limiting the information that can be viewed by various people.
Content Download	The software can be installed with just the configuration files. When users access a content that is not available, the content is downloaded and maintained in the client. Further use of the content will not require the network. Downloads can paused and resumed. Downloads can also be resumed after a network error.
Package Update	The system will detect a new version of the software, contents or mapping information and prompt the user to update these. Like content download these can also be paused and resumed.
Practical and pleasing view of contents	Supported for multiple views of contents as a list, a Thumbnail or card with details. Sorting and filtering options are provided for all these options. Users can like/not like contents. When viewing contents users can sort the list of contents based on the

	popularity of the contents (views or likes).
Support for multiple Curriculum	Currently Asha Kanini supports Tamilnadu and UP curriculum. It also supports English and Tamil medium for Tamilnadu and English and Hindi mediums for UP. It can easily be extended to support additional curriculum. Note auto-update feature will track which curriculum you are using and update just the contents for that curriculum.
Settings	Users can customise the behaviour of the app through settings which can set default behaviour (say on scanning a QR code), and control the way the contents appear to them.

Appendix III - Upcoming Features of Asha Kanini

Feature	Description
Data Analysis	Data capture and analysis of content usage with basic visualisation is already done. This needs to be enhanced. Similarly basic analysis and visualisation of assessment data is also done. This also needs to be enhanced along with correlation between students' performance and social factors that affect learning including poverty, malnutrition, parental education, student-teacher ratio and others.
Caching	This will allow us to place a limit on the size of the contents on the local device. When downloading a new content, the oldest accessed content will automatically be removed.
Assessments / Worksheets	Assessments and worksheets can be done by children right from the computer and their results will be tracked. This can be done in a network independent manner.
Library View	For individual children we have an alternate view that shows just the contents like books, videos, games, worksheets etc. that can be used by individual children. Filters can be set by age or kind of contents.
Easy Upload of New Contents	Provide online mechanism for people to submit mapping and contents for Asha Kanini. This will reduce the labour involved in the process. Further it will also pave the way for customised contents for different schools and school systems.