



**Case Study:** Digital education Program/e-Shala

**Case Study No:** 40

**Initiated in:** 2013

**Key terms:** Energy access, education, technology, schools, content

### **Digital Education / e-Shala**

- Problem statement/Need Identification
- Solution
  - System Design
  - Implementation
  - Financial details
- Impact
- Way forward

### **Problem statement**

Providing access to quality education and expanding learning opportunities for the students of the underserved communities in both rural and urban areas continues to be a major challenge. Some of the most prominent factors that accentuate this challenge are discussed below:

#### **Problems with traditional teaching**

Classroom environment which plays a crucial factor in motivating the children to learn is missing in many schools. Children face many challenges to engage in learning; the most intimidating of them all is not having a role to participate in the process. Children need to be encouraged to speak, to discuss, to express their opinions and to solve problems together. It has become very difficult to teach students lessons in many subjects esp. Science, Social studies and Technology due to the lack of learning tools (apart from the conventional classroom teaching). This leads to student disengagement and discontent which results in frequent absenteeism in schools.

In the past, students had to adapt to the teaching styles of their teachers but now there is a need for the education system to modify its delivery process to suit the learning styles of the students.

#### **Issues with teachers**

There is a severe shortage of qualified teachers in many schools in India. Also, teacher absenteeism in schools is a major issue. On the teachers' front, as much as the other non-teaching duties come in the way of good preparation, lack of subject expertise and teaching resources and over-crowded classes are few of the reasons that limit the teachers to a delivery mode of lessons, rather than engaging children in partnership for learning.

### **Lack of resources**

Many schools do not have adequate resources to invest in teaching and learning aids. There is a clear evidence to suggest that achievement levels tend to decline as the children move along the educational hierarchy. This shows that schools are not able to cope with the teaching learning load as the pupils' progress through various grades. There is a need for transformation in the way people find, learn and consume educational content.

### **Economic Divide**

The schools in urban schools are relatively in a better position when compared to most of the rural schools in terms of access to quality teaching, availability of teachers, access to quality education. But the situation of many low income government and private schools in urban areas is almost similar to their counter parts in rural areas. This economic divide causes education inequity. This leads to disengagement of the neglected students, dropouts and lack of opportunities for higher studies. In the long term, this education inequity decides and affects the life paths of the students, unemployment and lack of means of living.

### **Issues in the usage of technology**

Technology in general has transformed our larger society. It has become central to people's daily lives. And yet technology has been kept in the periphery of schools, used for the most part only in specialized courses( in a few cases esp urban schools).Technology in form of digital content delivered through devices such as projectors, computers, DVD players, handheld tablets can help the students to get quality content and uniform instruction without much dependence on parameters such as availability of qualified teachers and location of schools. Students and teachers must be encouraged use technology. For this, the teachers must be trained to use technology effectively and integrate it in their classroom instruction. However, the frequent power outages in schools or complete lack of access to grid supply of electricity in schools esp. in remote rural areas makes it very challenging to implement technology solutions in classrooms. This is the case also for schools that can afford to invest in e-learning equipment in urban areas. The table below shows the state wise percentage of schools which have electricity connection. However, the power supply is very erratic and unreliable.

Table 2.12 Percentage Schools with Electricity Connection: 2014-15

State/UT	Primary Only	Primary with Upper Primary	Primary with Upper Primary and Secondary and Hr. Secondary	Upper Primary Only	Upper Primary with Secondary and Hr. Secondary	Primary with Upper Primary and Secondary	Upper Primary with Secondary	Secondary Only	Secondary with Hr. Secondary	Higher Secondary Only	All Schools 2014-15	All Schools 2013-14
A & N Islands	80.72	96.30	100.00	100.00	100.00	100.00	-	-	100.00	-	88.89	88.86
Andhra Pradesh	91.08	94.70	100.00	100.00	86.11	97.60	97.11	93.55	83.33	93.21	92.76	90.34
Arunachal Pradesh	21.53	54.96	96.83	82.93	95.92	81.13	92.11	-	100.00	-	38.60	36.35
Assam	11.50	56.42	90.91	33.00	89.43	76.95	75.75	47.12	59.51	85.54	22.40	19.39
Bihar	13.76	36.32	51.49	34.96	81.82	37.29	33.07	34.88	47.95	64.86	25.22	9.96
Chandigarh	100.00	100.00	100.00	-	100.00	100.00	-	-	-	-	100.00	100.00
Chhattisgarh	60.51	88.83	99.02	72.18	89.93	96.02	75.38	55.21	86.54	47.62	66.88	57.26
Dadra & Nagar Haveli	97.16	100.00	100.00	100.00	100.00	100.00	-	100.00	100.00	100.00	98.55	96.79
Daman & Diu	100.00	100.00	100.00	100.00	100.00	100.00	-	100.00	100.00	100.00	100.00	100.00
Delhi	100.00	100.00	100.00	100.00	100.00	100.00	100.00	-	100.00	100.00	100.00	100.00
Goa	98.99	100.00	100.00	100.00	100.00	100.00	100.00	-	-	100.00	98.72	98.17
Gujarat	99.27	99.87	100.00	100.00	99.52	100.00	97.33	99.64	99.97	99.73	99.72	99.72
Haryana	98.61	99.70	100.00	95.70	99.79	99.79	99.37	-	75.00	100.00	98.74	98.89
Himachal Pradesh	93.99	97.95	99.82	85.79	99.55	99.85	97.76	100.00	100.00	100.00	94.22	94.90
Jammu & Kashmir	11.67	25.67	96.79	48.51	87.50	75.19	66.75	64.52	89.81	50.00	26.39	23.47
Jharkhand	8.48	23.77	88.15	52.63	66.75	43.57	55.01	58.01	70.43	76.95	17.98	16.35
Karnataka	97.05	98.70	99.56	98.59	100.00	99.44	97.63	96.60	99.17	92.04	97.64	96.78
Kerala	94.85	98.85	99.50	99.54	99.61	98.61	99.74	100.00	99.08	98.18	97.01	96.08
Lakshadweep	100.00	100.00	100.00	100.00	100.00	-	-	-	100.00	-	100.00	100.00
Madhya Pradesh	11.84	84.03	95.38	23.42	93.89	94.12	87.76	48.02	77.61	80.00	28.29	28.27
Maharashtra	90.75	97.33	99.29	85.59	99.11	99.27	96.87	94.03	97.64	97.58	93.93	92.75
Manipur	9.73	42.42	95.74	44.26	91.30	74.96	77.63	46.34	90.48	100.00	30.66	30.97
Meghalaya	14.86	60.53	100.00	38.78	95.83	89.47	88.36	62.34	94.19	87.63	26.72	24.49
Mizoram	64.07	78.37	-	78.41	-	-	-	87.38	-	94.70	74.56	73.79
Nagaland	18.07	40.54	96.94	49.35	84.09	90.85	73.36	33.33	100.00	100.00	40.94	39.06
Odisha	13.89	41.16	98.23	33.20	98.11	61.28	67.80	66.09	-	-	29.73	27.88
Puducherry	100.00	100.00	100.00	100.00	100.00	100.00	100.00	-	100.00	100.00	100.00	100.00
Punjab	99.96	99.85	99.96	99.69	100.00	99.96	100.00	100.00	100.00	100.00	99.88	99.86
Rajasthan	19.05	69.76	93.96	66.77	96.76	85.70	90.61	92.00	98.04	100.00	55.28	52.07
Sikkim	59.16	81.68	97.53	100.00	83.33	88.15	50.00	-	-	-	70.72	69.30
Tamil Nadu	97.77	99.39	100.00	97.39	99.96	-	-	100.00	100.00	100.00	98.51	97.69
Telangana	87.24	94.47	100.00	100.00	74.37	97.72	97.28	100.00	100.00	93.60	91.05	-
Tripura	13.62	13.45	99.09	100.00	98.53	78.89	80.00	-	-	-	28.58	24.94
Uttar Pradesh	49.64	71.85	85.35	50.49	81.93	75.92	72.22	70.39	83.97	90.00	53.59	52.19
Uttarakhand	71.88	89.83	98.48	81.35	96.68	98.01	85.16	54.01	77.19	100.00	76.95	74.21
West Bengal	52.52	79.66	93.19	45.63	98.16	90.91	93.59	0.00	100.00	91.67	56.96	42.76
All India	49.63	73.26	95.31	48.33	94.81	84.04	89.15	77.55	83.85	92.67	60.01	56.78

Ref: Education report - District Information system for Education(DISE)

## Solution

One of the feasible solutions to address the above mentioned problems was the creation of quality customized content that can be delivered even by under-qualified teachers through cost effective delivery mechanism which took into account the unreliable electricity supply in schools.

SELCO Foundation with its vision to provide renewable energy to all has provided an innovative technology solution called “**e-Shala**” – *shala is school in local language of Karnataka*- to address this issue taking into consideration parameters such as :

- cost
- single-user vs. group teaching needs
- interactive vs. non-interactive content
- licensing and platform dependence issues
- specific requirements of the school.

”e-Shala” is a holistic solution that includes technical and non-technical aspects

- identifies deserving schools
- improves the quality of classroom education through digital content
- increases learning effectiveness

- provides efficient solar powered infrastructure(LED digital projector OR a 32” flat-screen LED television with movable trolley) to ensure predictable usage and sustainability of the solution
- provides a detailed teacher training program to equip teachers with the knowledge and expertise required to deliver quality and effective teaching using the implemented tools.

## System design

### Content

SELCO Foundation has partnered with The Children’s Lovecastles Trust (CLT) India for content for e-Shala. The content of “e-Shala” has multimedia and video recorded content for subjects such as for Science, Math and English for Grades V to X. The content is in English and Kannada and is mapped to State Board curriculum. The visual instruction encapsulate the content knowledge and best teaching practices of the urban qualified teachers which can be transferred and implemented in rural areas. The learning is made engaging for students and also helps with recapitulations of key highlights. The content has the adaptability to suit the varied needs of rural schools. It can be accessed via devices such as Android mini-PCs, tablets and mobile phones.

Since CLT’s content was non-interactive and has a license key, the content was installed on a portable android device and connected to a projector. One set of content license was given to 3 grades. Additionally, to help the teachers to get familiarized with the content before the class, each school was provided with a tablet in which the content was installed. This tablet was shared amongst all the teachers who used the digital content to facilitate teaching.

The content enhances learning in the classroom and can also help to partially address the issues of teacher attendance, ability and motivation. The students themselves can use the content for self learning in the absence of the teacher. The content also helps as a bridge course material for dropouts.

<b>Content type</b>	Non-interactive (slideshows and videos with voiceover)
<b>Content format</b>	.mp4 and .flv
<b>Platforms supported</b>	Windows & Android
<b>Licensing</b>	A license key is generated for each system that the content is installed on
<b>Content update mechanism</b>	The content can be updated free of cost for 3 years after purchasing a license from CLT. The updated content is generally sent by CLT in a CD or USB drive.
<b>Teacher training</b>	CLT conducts a teacher training workshop to familiarize teachers with: a) Using a digital education tool such as a computer b) Navigating through the e-Shala content

## Technology

DC Projector - 550 Lumens - Only Solar
Android device with 32GB SD card
Wireless Mouse
Solar module -75 Wp , Battery -60Ah
Speaker set

SELCO is responsible for servicing in case of any problems with the hardware. The warranty period of individual components is given below and SELCO will maintain the system based on the annual maintenance contract. The cost of the Maintenance Contract is mentioned in the Financial details.

Warranty Period (in years)	
Solar Panel	5
Battery	5
Charge regulator	5
DC Projector	2
Android device	1

## Implementation

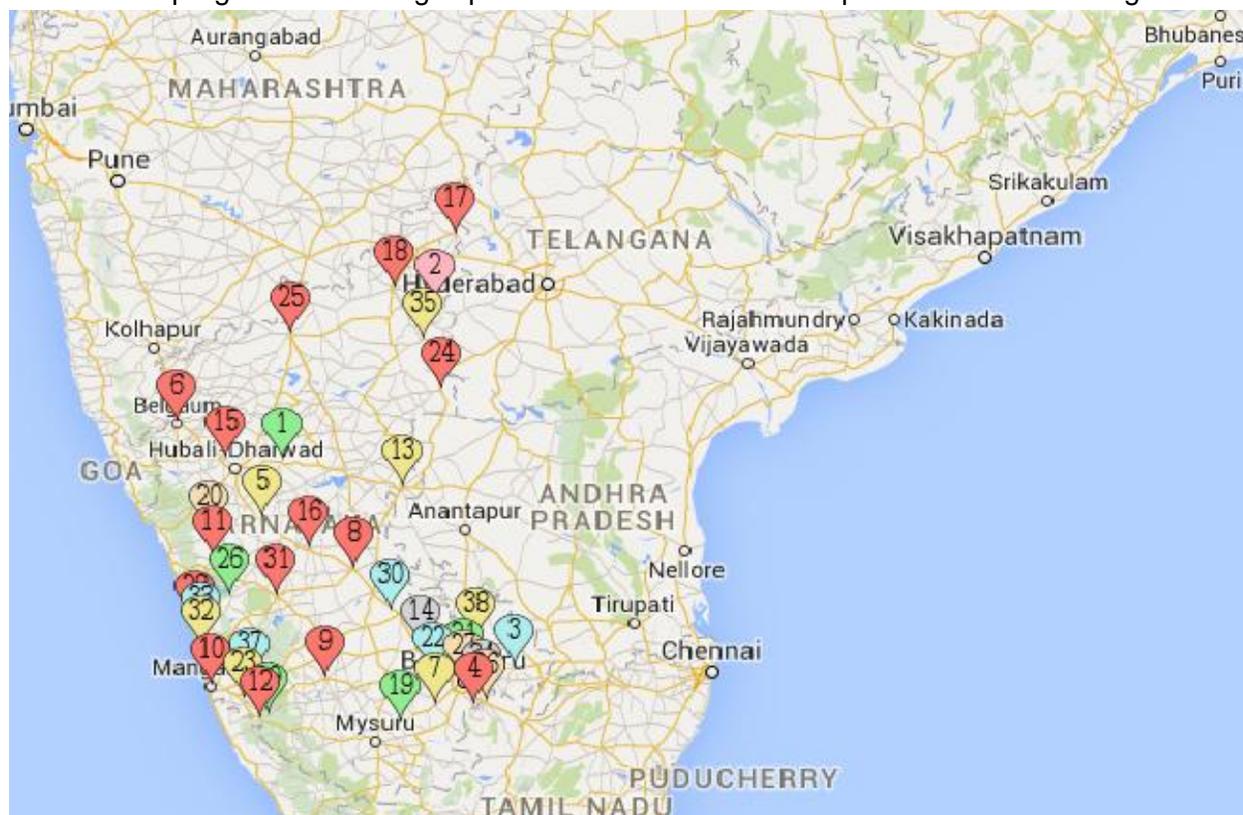
### Key Stakeholders and their Responsibilities

Funding Partner: Menda Foundation	SELCO Foundation: Ideation and Implementation Partner	CLT: Knowledge Partner
<ul style="list-style-type: none"> <li>• Partner in funding</li> <li>• Identify additional funding partners</li> <li>• Advocacy</li> <li>• Overall project monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Need based identification of schools</li> <li>• Technology solution</li> <li>• Solution implementation and maintenance</li> <li>• Partner in impact assessment</li> <li>• Branding and publicity for the project</li> </ul>	<ul style="list-style-type: none"> <li>• Providing digital content</li> <li>• Teachers' training</li> <li>• Knowledge support for teachers</li> <li>• Updating content in a timely manner</li> <li>• Partner in impact assessment</li> </ul>

**School : Project Recipient and Partner**

- Smooth implementation on-ground
- Ensuring participation of teachers in the training program
- Ensuring that installations are safe & well-maintained
- Providing useful feedback to all stakeholders
- Independently sustaining the program after the agreed period of 3 years

The e-Shala programme is being implemented at 223 schools at present in the following areas:



**Figure 1: Map of DEP installations in Karnataka and Andhra Pradesh**

#### **System design- Financial details:**

The total system cost is INR76,500. Of the Total system cost, as of now Rs.39,500 is being contributed by the Menda Foundation and the remaining amount is paid by a local funder. The system includes an android device with 32GB SD card, wireless mouse, trolley, solar module 75Wp, battery 60Ah, DC projector 550lumens, speaker set, content, 1 day training and maintenance cost for 5 years per grade.

#### **Impact**

Any impact assessment has not been conducted in the Academic year 2014-15 as it was the first year of implementation in Pilot schools. A detailed impact assessment study for the Academic year 2015-16 is being carried out by an external organisation called Grey Matters

with a sample and control group to measure the impact of the project, to capture the learning, and to identify the areas of improvement and hence study the effectiveness of the system.

### Way Forward

#### **eShala has a scope for building on the existing system.**

- The schools implementing eShala can serve as adult education centers where adults can take part in education after the school hours. If adult literacy content is provided on the eShala android device, they can use it learn basic literacy, mathematics, job skills etc.

*SELCO has recently replicated this process to start Adult Literacy program in Gadag, North Karnataka for a community of farmers. The content which is a multimedia eLearning system has been developed by Tata Consultancy Services.*

- The schools implementing eShala can also serve as community engagement and learning centres. Multimedia content and documentaries on issues such as health, sanitation, hygiene, human rights, sustainable villages and their development, agriculture, government policies & mechanisms, AIDS awareness etc. can help the community members to a great extent. However, this would require proper planning and partnering for implementation and operation.
- The eShala classrooms if provided with computers and internet access can serve as technology centres for community skill based technical learning.

The impact of eShala on student learning cannot be denied but there are some concerns/challenges explained below when addressed can make the system more effective.

#### **Cost**

There is a need to make this system affordable to schools in the absence of a funder. It would be possible if cost effective alternatives to the existing projector (which costs around Rs.25,000 at present) is figured out such as linkage to a payment mechanism or education scheme and so on.. This will ensure to make eShala affordable and reach out to more number of schools. Hence, there is a need to explore new frontiers of cost and value.

#### **Curriculum**

Currently, the curriculum of the eShala content is fixed (atleast for 3 years) and the learning objectives are pre-set by CLT/State board. The curriculum has to be upgraded periodically and must integrate technology and high quality instructional materials to help students in learning the applications of the knowledge in real life. It has to be tailor made or atleast have the flexibility to be customised according to the needs of the students. Another question to ask here is whether the students have the flexibility to decipher and customise their learning goals within the framework provided by the education system.

#### **Moving from Consumers to creators**

eShala programme (or any other e-learning product) would not be effective if there is no proper investment of teachers. Teachers need to play an active role in the implementation of eShala programme and it should not be considered as a substitute for a teacher or threaten their existence. It should not be a burden to their already busy schedules. In short term, eShala must help the teachers to be users of technology, to experience its advantages and expand their teaching capabilities.

In the long term, eShala should push the teacher expectations, set them on a trajectory to higher innovation where teachers move from being consumers to being creators.

Can we also mobilize the generation of young people to create rather than simply use technology? Can they take part in the creation of virtual K-12 Schools?

### **Internet connectivity**

Access to internet services if provided at affordable cost will be able to help the teachers and students to teach and learn more effectively.

### **Experiential learning**

Usage of digital content in classrooms is not sufficient. The students become passive learners if they just made to watch the multimedia content and will lose interest after the initial novelty phase.

Teachers will either lose interest in teaching, either due to laziness or a feeling of powerlessness. The digital content has to be supplemented with proper experiential learning such as relevant hands on activities, experiments, internet activities, discussions and real time assessments. Strong critical thinking is often grounded in the questions we ask. By deliberately teaching questioning skills, we will be facilitating a process that will help students develop a mental muscle necessary for deeper learning, creativity and innovation, analysis, and problem solving. Gaming may help kids learn a variety of leadership skills, such as resource allocation, negotiating with friends and adversaries, manipulating situations and environments, actively pursuing their goals, and recovering from failures.

**The technology in eShala is to be regarded as an aid to stimulate higher engagement of teachers and all students.** The teachers should be able to clearly see the student engagement and growth. This would motivate them in further investment.

### **Closing**

Schools will not disappear anytime soon. Schools were prevalent in the era of apprenticeship, and they will be prevalent in whatever system of education that comes into being. But as the seeds of a new system begin to emerge, education will occur in many different, more adaptive, venues and schools will have a narrower role in learning. If schools cannot successfully integrate new technologies into what it means to be a school, then the long identification of schooling with education, developed over the past 150 years, will dissolve into a world where

wealthier students pursue their learning outside of the public school.eShala programme's effectiveness will depend on its flexibility to adapt to the requirements of the students.

As Charles Darwin wrote about evolution of life forms—"It is not the strongest of the species that survive, nor the most intelligent, but the ones most responsive to change" is as much relevant for the education sector.

### References

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### **Pictures:**



**Images: Displays solar powered projector from ceiling in class room and in stand mode.**