

TEACHING AND TECHNOLOGY: CASE STUDIES FROM INDIA

Edited by Dr Gary Motteram

January 2017



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We have currently given over 25 grants to early-stage non-profit organizations working across the thematic areas and are working with multiple Indian state governments. Founded in 2012, we are a charitable trust registered in India.

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Published by:

British Council
17 Kasturba Gandhi Marg
New Delhi 110 001
India

Central Square Foundation
707 Mercantile House
Kasturba Gandhi Marg
New Delhi 110001
India

Design

Ishtihaar, New Delhi

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CONTENTS

Foreword – Central Square Foundation	4
Foreword – British Council India	5
Introduction	6
Locations of case studies	10
Case studies and key to icons and terminology	11
Augmented and virtual reality	12
Mobile based learning using QR codes	14
Promoting learner autonomy for children with special educational needs	16
Interactive tablet learning for maths and science	18
Video conferencing and text-based discussion	20
WhatsApp community of practice for teachers	22
Gamified mentoring app for teachers	24
Digitising delivery of teaching and learning at night schools	26
Communication with parents	28
Technology platform for teacher development and resources	30
Bridging the education gap with video conferencing	32
Using teacher-made videos to support learning	34
Teacher development using recorded video	36
Co-creating infographic summaries of texts	38
Mobile learning	40
Whole-school integration of technology	42
Using video conferencing to foster global citizenship	44
Offline Moodle-based Learning Management System	46
Recording classes to improve teaching and learning	48
Learning centres	50
Improving communication channels using WhatsApp	52
Using the internet as a teaching resource	53
British Council India: teaching and technology	54
Central Square Foundation: teaching and technology	55
Glossary	56
Acknowledgements	57

FOREWORD

At Central Square Foundation, we believe that technology in education is effective when viewed as a tool rather than an end in itself. It enables teachers, students and leadership to perform their tasks better. The last few years have seen a rapid increase in smartphone penetration and technology in schools has received a big boost under the ICT@Schools scheme launched by the government of India. There have been multiple challenges with its adoption and use, as we have outlined in our previous publications *Teaching with technology: Early EdTech adoption by Indian school teachers* and *The EdTech promise: Catalysing quality school education at scale*.



However, our interactions with teachers on the ground have given us hope. In small pockets across the country, we have seen highly motivated teachers and school leaders create their own micro-innovations using technology. There are clusters of ‘tech-savvy’ teachers in several states who are trying to galvanise their peers by building web portals and mobile applications with digital content, information, community forums, etc. Large organic growth of such platforms is indicative of a high demand for technology solutions which solve real problems for teachers.

We believe India has just begun exploring the potential of technology in education, and in a country where multi-grade teaching is commonplace and most teachers receive no professional development, the rapid diffusion of internet-enabled devices offers an opportunity to personalise learning for students and teachers. Adaptive learning platforms enable students to access learning material pitched at their individual academic level and learn at their own pace. Smartphone applications give teachers access to high-quality professional development material, lesson-planning resources and teaching-learning material for little or no cost.

In this publication, we wish to highlight a few innovative teachers and organisations, which have been using technology. We have tried to include a broad variety of cases, spread across geographies, types of schools and focusing on different possible uses. We believe that there are more teachers out there who use technology in their daily practice of teaching and for professional development. Through this, we also hope to inspire teachers and school leaders to experiment with technology by adopting some of these ideas and customising them for maximum impact in their own classrooms and schools.

Ashish Dhawan

Founder and Chairman
Central Square Foundation

FOREWORD

We are delighted to be working with Central Square Foundation on this joint publication, highlighting innovative uses of technology by teachers and others working within the school system in India. At the British Council, we recognise that technology can play a significant role in contributing to targets of the Sustainable Development Goals, by providing platforms for increasing access to high-quality educational resources and reaching larger numbers of people. Technology may not always be appropriate or necessary, but there is no doubt that prudent integration into educational provision can have a number of benefits.



Given the numbers of teachers and learners in India, the potential for the use of technology to leverage improvements within the education system is clear. We, our partners, the central and state governments and other organisations and individuals are increasingly looking for digital solutions. A wide range of creative products and services have been developed, but there is a clear appetite to further explore the many possibilities that exist within India, the UK and around the world to determine which solutions can have the most impact.

We integrate technology across the British Council's portfolio of work in a variety of ways, particularly to further our impact in English language development and education. For example, we have expanded the work of our face-to-face teaching centres into the myEnglish blended learning offer and several digital products to enable learners from non-metro locations to access high-quality English language teaching online or via mobile technology. In our teacher education projects, we utilise social media and other platforms to help form communities of practice, share resources and provide online training. We recognise digital literacy is one of the 'core skills' needed for the 21st century, and therefore work to develop this in teachers and learners to enable them to access professional development opportunities, English and education in general.

This collection of case studies represents a fascinating overview of the work that is being undertaken across India to improve both access to and the quality of education. The stories illustrate a range of innovative uses of both hardware and digital content. We hope that by helping to share these stories, others will be inspired to experiment, adopting and adapting the ideas, to help realise our shared vision of high-quality education for all.

Alan Gemmell OBE
Director, British Council India

INTRODUCTION

DR GARY MOTTERAM

University of Manchester

This publication provides a snapshot of the broad range of uses that are currently being made of digital technology in education in India. It presents a series of case studies, mostly taken from schools, but also from NGOs and technology companies who are providing a range of digital services to education, and one from a higher education college. Some of the case studies have been chosen to illustrate commonly occurring practices in the data set, for example the use of video, while others have been picked to illustrate the diversity of technological use seen across the case studies we collected.

The case studies have been curated to provide insights and inspiration for both teachers and schools who want to use technology in their classrooms. Similarly, it can show policymakers the impact that digital technologies can make in education in the 21st-century. While a small number of the examples show a very high-tech, whole-school response to using technology in the classroom, we have also chosen cases studies of individual teachers wanting to make a difference for their learners in a more localised way. Alongside these we also describe companies developing apps to support the school curriculum and large-scale projects of organisations working with underprivileged children.

Technology in education

As with elsewhere in the world there is an increasing focus in India on the role that digital technologies might play in education. A report in the India Times online in October 2016¹ had the headline: '10,000 Primary Schools In India Will Now Get Free Access To Wi-Fi Facility With Unlimited Data', demonstrating the interest in making sure schools are equipped to participate in the technology revolution.

However, the UN Development Report (2015)² shows that although India has the second largest population in the world, in excess of 1.3 billion, with 32 per cent living in urban areas and an average age of 26.9 years, between 2009 and 2016 only 3.8 per cent of its GDP was spent on education, an overall increase on previous years, but still relatively low by international standards. The literacy rate for males aged between 15 and 24 in the same period was 90 per cent, and 82 per cent for females. Rates of attendance at primary schools is 85 per cent for males and 82 per cent for females, however, the figures for secondary school level drop to 59 per cent and 49 per cent respectively. In the same report India is ranked 130th in the world out of a total of 188 in human development terms. It is therefore considered to be a country at the medium level of development. Alongside this, the same UN Development Report gives figures for 2014 of 75 mobile phones for every 100 members of the population, but only 18 per cent had access to the internet. Figures from the GSMA³ on mobile access in 2015 report 615 million unique mobile subscribers; this represents 47 per cent of the population of which 30 per cent have mobile internet access. By all accounts, these numbers are rapidly increasing.

At the time of writing, a report has appeared in the media of children in Uttar Pradesh working on their own with tablets to teach themselves while their families work in the fields.⁴ Evidence presented in the report suggests that these children are learning quite effectively using these tablets with 'an 11% increase in pupils' core academic skills such as reading in children's mother tongue, reading and speaking in English, and science.' Although the UN Development Report shows Indian schools are not reported to be doing well in improving children's academic progress, this collection of case studies hopefully illustrate

1 Tiwari, S. (2016). 10,000 primary schools in India will now get free access to wi-fi facility with unlimited data. *Times of India*. Online: www.indiatimes.com/news/india/10-000-primary-schools-in-india-will-now-get-free-access-to-wi-fi-facility-with-unlimited-data-264180.html. Accessed 11/12/16.

2 All these data come from The United Nations Human Development for 2015 <http://hdr.undp.org/en/2015-report>

3 www.gsma.com/mobileeconomy/india/

4 Winthrop, R. (2016). Indian pupils invent their own lessons. BBC online: www.bbc.co.uk/news/business-37618901



that good-quality teacher support alongside the use of technology can have a good effect. We are also told that digital technologies can transform the educational process, and in the current publication we see case studies of people trying to do just that. In the debate around the use of technology in education there are inevitably a number of perspectives.

Selwyn (2016)⁵, who is very vocal about making sure that we are not seduced by the hype and rhetoric that often accompanies the introduction of technology in schools, also shows that if we do include technology in an appropriate way we can be successful. Selwyn and Cooper (2005)⁶ contend that technology use that can be effective in science education should be based firmly on the issues that need to be addressed in the science curriculum. They argue that students are not interested in the way that STEM subjects are currently taught and see little relevance in the teaching to the real world; that students are found to be enthusiastic when they encounter science informally outside of school in museums and as a part of the broadcast media; and that students ‘learn to control their own learning through metacognitive strategies’ (p 266). Golonka et al. (2014)⁷ reviewed technology used in

foreign language learning and point out that there is a lot of good evidence to support the fact that technology can make a difference when it comes to the affective side of education. Therefore it seems fair to say that when care is taken to introduce technology appropriately it can be effective.

Data collection

The case studies that are presented here have been selected from a total of 438 individual submissions that were collected in a short window between 19 October and 7 November 2016 via a Google form. The call for proposals was promoted through the networks of Central Square Foundation and the British Council and on social media. The questions used in the form were formulated by a team consisting of colleagues from British Council India, Central Square Foundation and myself, Gary Motteram, as the editor of this volume. The questions were piloted by colleagues in the British Council offices in Delhi. The questionnaire was aimed at teachers and representatives of organisations; however, the emphasis even with the institutional responses was on finding out about teachers using technology in or outside of the classroom, with their learners or for their own

5 Selwyn, N. (2016). *Is technology good for education?* Cambridge: Polity Press.

6 Selwyn, N. and Cooper, R. (2015) The potential of digital technology for science learning and teaching--The Learners' Perspective. In D. Corrigan, C. Bunting, J. Dillon, A. Jones and R. Gunstone, (Eds.). *The Future in learning science: What's in it for the learner*. Switzerland: Springer.

7 Golonka, E. M., Bowles, A. R., Frank, V. M., Richardson, D. L. and Freynik, S. (2014). Technologies for foreign language learning: A review of technology types and their effectiveness. *Computer Assisted Language Learning*, 27 (1), 70-105.

professional development. Where an organisation has presented the ways it uses technology we have endeavoured to include a teacher perspective.

Once the collection period was complete the publication team read through all of the case studies assessing them on a three-point scale in terms of whether or not we thought the case studies were innovative in their use of technology. We wanted to find out why teachers wanted to use technology for learning, what technologies they were using and how and the effects they had seen.

We generated 'in vivo' codes,⁸ by making use of the language used by the case study writers, but also descriptive codes when the language was not directly available in the case studies. We wanted to provide both a representation of different forms of practice to illustrate these to others, but also to show some general trends. As well as representing different technologies and different forms of teaching practice, the case studies also represent a range of subject areas and different types of schools. The predominant subject area is the sciences, but we also see social sciences, maths and English represented too.

Emerging themes

As we worked through the data set one of the early descriptive codes we created was 'visualisation'. We labelled 26 of the cases studies using this code, but quite a few more had elements of this use of technology. Other related codes included: *class video*, *listening*, and *promoting project-based learning via authentic learning and active learning*. From these and other codes we realised that teaching with visuals and video was the most popular form of using technology in the classroom across the submissions. This practice occurred most commonly in science classes, but we also see it used in social sciences and English lessons. A common example was in biology with the specific example of digestion occurring a number of times. Teachers claimed that the children were better able to understand the material when it was presented in a video or animation format as oppose to their textbooks, or through pictures drawn on the board. It was also suggested by teachers in this data set that by using this technology the children were able to retain the ideas and information more easily. Teachers often presented this material embedded in PowerPoint slides on an interactive whiteboard (IWB). In a number of examples this basic presentation of material was extended to include the students, who were asked to do their own research around a topic promoting problem solving skills and project work.

This is often described as *active learning* by the case study writers (an *in vivo* code) and this was another common code we used to label the case studies. Quite often this sort of activity involves the students both researching a topic and then presenting it to the rest of the class encouraging 'digital literacy' and the '21st-century skills'. For the development of English skills, the video materials are often used for listening practice, as might be expected, but also for group and project work. Teachers are prepared to be resourceful in trying to make materials available to their learners and not all of the schools that used these kinds of technologies have access to very high-tech projection facilities or the internet. One teacher describes going out of the school to find places where he could download material to a pen drive to use in his teaching. Another creates his own videos which he plays to small groups of children on his own laptop, enabling differentiated learning.

A code that relates to student engagement in the learning process is that of *learner autonomy*. This was a descriptive code that we applied to a number of the cases where the teacher is actively encouraging the learners to seek out ideas and information for themselves, and trying to build up the children's skill set to make them more able to work independently. Another associated code that would support the teaching with visuals and videos would be *learner scaffolding*, providing a framework of support for the learners that is gradually taken away as they develop the necessary skills to work on their own.

A further extension of the use of video evident in the data set was in *flipping the classroom*. The use of the term 'flipped classroom' has become popular more recently (Bergmann and Sams, 2012),⁹ particularly in higher education, but we also see this practice happening in primary and secondary schools when teachers want to try to make the classroom more active. Teachers ask their students to preview video material, potentially do follow-up research and then come to the class ready to talk about the issues. This moves the model of education from a teacher-fronted experience, where learners are given content to learn and reproduce in examinations, to a place of exploration and discussion. Learners are often encouraged in this model to start producing their own materials that the whole class can engage with. This kind of material can be stored on a blog, a wiki, or inside a Google classroom.

A second set of codes that became evident in the material included: *reaching rural/underprivileged*

8 Saldana, J. (2016). *The coding manual for qualitative researchers*. London: Sage.

9 Bergmann, J. and Sams, A. (2012) *Flip your classroom: Reach every student in every class, every day*. The United States: ISTE and ASCD. <http://flippedlearning.org/>

communities, basic skills development, education provision for rural schools, disadvantaged learners, and low-tech, but large-scale. This practice involved organisations, mostly NGOs, trying to reach children and adults who are unable to access good quality education for a variety of reasons. This is a recognised feature of the educational landscape in India and we see governments, the private sector and NGOs looking for innovative ways to meet Sustainable Development Goal 4 (SDG4) ‘Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all’¹⁰ across the world.

These projects are often described by the organisations who submitted the case studies as trying to reach ‘underprivileged children’ or ‘communities’, which are often rural communities, in quite remote or difficult to access locations where resources are limited. These projects are generally also associated with improving economic well-being, by providing the learners with real-life practical skills alongside basic language and maths education. The example described above, of children teaching themselves with tablets, is a similar initiative. In all of the cases described in this book teachers are involved in the process and a key element of these projects is the upskilling of teachers to enable them to be more able to work effectively in their schools.

The technologies used might be tablets, solar-powered projectors, a system to create a local Wi-Fi network, a version of Moodle modified to work offline, or an app to promote teacher development. Systems are provided for children who work during the day in rural communities, in other remote areas where there are no facilities at all and classes are held in the open air, or are a part of the ongoing aim of local education authorities to improve regular schools and make use of existing technologies.

A related set of activities includes making use of video conferencing tools like Skype to support local communities. Classes are offered on a regular basis and are based on an assessment of local needs; these might be offered to children and adults in remote areas of the country, or to young girls living in the slums of Delhi who are not for a variety of reasons able to attend regular schooling.

A focus on teacher development was very prevalent in many of the individual cases studies. Teachers themselves, if they have access to opportunities to do so, use technology to find suitable learning material for the classroom, but also learn a great deal by engaging with this material themselves. Many of the teachers talked about how they were able to keep

better up to date with new or developing topics in the curriculum and were able as a result to introduce children to new concepts. Some teachers would make use of storage facilities in the cloud, or blogs and wikis to post material for their learners or anyone to use. They were not, however, only interested in better content knowledge but also looking at exploring different pedagogical approaches, some of which have been mentioned above. Teacher development features in projects that bring groups of teachers together using social networking tools such as WhatsApp; sometimes this is at a school level, but it can also be on a regional level for example where all the secondary science teachers engage in a discussion on a WhatsApp group. Teachers also want to get parents more engaged and again use social networking tools to achieve this, as well as more sophisticated approaches such as e-portfolio tools.

The data set reveals a lot of enthusiastic teachers and organisations trying hard to make a difference in many different classrooms across India. There is a lot of similar practice, which is reassuring, but also a lot of different and innovative examples of technology being used in pedagogically appropriate ways to meet the needs of the current generation of learners in their particular contexts.

This publication shows a wide range of practice being engaged in a variety of schools and other educational contexts. It shows what is possible and gives a range of practical examples and links to further information for anyone wanting to start working in their classrooms with limited access to technology. A basic mobile phone, tablet or laptop can be used to record learners, or attached to a set of speakers can be used for listening practice. Access to a projector gives the option of showing videos, which can be pre-downloaded if the internet is not accessible in the school. Once you add in internet access, or a greater number of devices, options begin to multiply. We also see locally developed apps that take into account the realities of school contexts, such being able to work offline. More commercially oriented companies are also developing interesting tools for use in education, but again taking into account the realities of access for example by ensuring their product can work on low end devices.

With India’s access to technology, particularly mobile, set to grow considerably over the coming years, there are clearly many opportunities and we hope this publication will encourage a wide range of new innovative activities to take place in the classroom and beyond.

¹⁰ <https://sustainabledevelopment.un.org/sdg4>

LOCATIONS OF CASE STUDIES



*The outline map of India shows the administrative boundaries of the states and union territories of India only for reference and these are not to scale.

CASE STUDIES

Twenty two case studies were selected from the 438 received to illustrate the different types of technology that are being used in classrooms across India. The following cases highlight the work of both individual teachers (blue) and organisations including NGOs and private sector companies (orange).

KEY

Types of technology



audio
recording



video
recording



laptop



mobile



projector



interactive
whiteboard



tablet



VR

Types of schools

Government – operated by the government and usually providing education to children from low-income families

Low-income private – operated by private owners usually charging fees below Rs 1500 per month

High-income-private – operated by private owners usually charging fees above Rs 1500 per month

Learning centres – after school centres to supplement curriculum taught in school

Night school – for children who are unable to attend school during daytime

College – for education beyond grade 12

All links are live in the pdf version of this document.

AUGMENTED AND VIRTUAL REALITY

MOHAMMED FAZIL

Teacher



Grade: 4–8

Subject: English and maths

Location: Bangalore, Karnataka

School type: Government



© Mohammed Fazil

Introduction

Mohammed Fazil works in Bangalore, South India. He teaches grades 4 to 8. He uses augmented reality in the classroom by putting triggers around the classroom to give additional information. He uses virtual reality with Google Cardboard and Google's Expeditions app. He also uses motion sensing with a Microsoft Kinect connected to a laptop where students participate in kinaesthetic maths games.

Why technology is being used

Mohammed says his 'primary goal was to make the lessons and classroom experience more exciting. Technology added more activities into a lesson and gave my learners more ways of exploring a new topic. The children were moving around the classroom more. I wanted them to feel at ease with using technology since in their future they will need the skills of using technology as a tool too. Personally, I wanted to explore what was possible with technology in enhancing the classroom experience. I wanted to

create proof points that other teachers could gain inspiration from. I was also trying to bring them the experiences that would have been cost prohibitive without the use of technology. My students almost never travel beyond their community and I wanted them to explore different places around the world in virtual reality. Now, they've got more tools to express themselves, through presentations and videos made on tablets. I got a chance to use more methods to gauge learning outcomes as well.'



How it works

Mohammed uses virtual reality to take students on virtual field trips. The students explore places like the Taj Mahal and National Parks, go on underwater expeditions and then write about their experience. He uses a Microsoft Kinect controller to get the students to play motion sensing math games such as Jumpido. They get to move around while answering maths problems. He also uses augmented reality apps that enable him to add extra levels of information to teaching resources. Students can walk around the class to scan specific markers using the iPad to unlock additional information about books they read.

A recent lesson involved a virtual field trip to New York, as a part of the human rights week focusing on children and the refugee crisis. Students watched a video created by the *New York Times* called *The Displaced*. The video shows the lives of refugee children from Ukraine, Sudan and Syria. Students took turns watching the video through a Google Cardboard viewer while their classmates watched the Cardboard app mirrored on the projector screen. This let the students be immersed in the environment where the refugees were.

Mohammed says

‘One powerful scene was when food was being air dropped from a plane. The students could turn around to see people scampering all around to take the food packets. This gave them a better understanding of the scale, which they may not have got from watching a regular video.’

What Mohammed observed

Mohammed says, ‘I have noticed that I am able to deliver better lessons by using technology. Teaching in English to Kannada-medium students was a challenge at first. Once I started using technology in class there

was more visual media for them to learn from. Their ability to grasp new vocabulary has advanced due to this. Student participation has also increased because they love to get their hands on the iPad or Google Cardboard viewer. It also increases the curiosity of the students; they ask more questions about how things work.’

Challenges

The main challenge Mohammed faces is making sure that technology does not take precedence over learning. He is always looking for learning outcomes for a specific use of technology, not just using it because it is new and different.

The way forward

Mohammed has a number of suggestions for those who are interested in adopting this approach. He says teachers ‘should consider first the problems they want to solve and then look for the best technology to use. They should collaborate with other technically proficient teachers or professionals. Most importantly teachers should not be intimidated by technology. Organisations that put technology in the hands of teachers should not limit their training to just the use of technology. They should run sessions where teachers can design solutions based on their own needs they have identified. This will help make teachers more involved and invested.’

To find out more

- <https://vr.google.com/cardboard>
- <https://www.google.co.in/edu/expeditions>
- <https://developer.microsoft.com/en-us/windows/kinect>

MOBILE-BASED LEARNING USING QR CODES

RANJITSINH DISALE

Teacher



Grade: 1–4

Subject: All subjects

Location: Solapur, Maharashtra

School type: Government



(c) Ranjitsinh Disale

Introduction

Ranjitsinh Disale works in Solapur, Maharashtra in west India where he has introduced a number of different ways of making his teaching more interactive. One way is the use of Quick Response (QR) codes in textbooks to provide additional links to online materials as a means to extend the curriculum, either in the classroom or when the children go home. He has created materials for Grades 1–4. At the same time he also makes a lot of use of mobile technologies to manage absenteeism and to keep in touch with parents. As Ranjitsinh works in a primary school, he works across all of the subject areas.

Why technology is being used

Ranjitsinh tells the story of his arrival in his teaching context: 'I still remember that day, my first day of joining the school. I saw one of my classrooms was being used as a cattle shed. Villagers were unaware about the importance of education. They preferred to send their child to the farm rather than to school. So I had to change that mind. And technology helped me a lot.'

Along with the QR code initiative, technology was also used to encourage connections with the community. He started a Google SMS channel in 2010 to send messages to parents whose children were absent from the class. Now he is sending SMSs to tell the parents about the children's homework to encourage them to use the QR codes in the coursebooks. He also uses a WhatsApp group so that parents can interact with the teachers.



The teaching process

Ranjitsinh says, 'I use mobile-based technology in teaching. I have developed "QR-coded Textbooks" for grades 1 to 4. I have developed all the content of grades 1 to 4 in digital format. This content is encrypted in the QR codes. All these QR-coded stickers are pasted on the relevant pages in the textbook. If a student wants to listen to an audio format of a poem or he wants to watch a video of a lesson, all he needs to do is to scan that QR code.'

In the early stages of adding the QR codes to the coursebooks Ranjitsinh used free online resources like maths worksheets and 'Emma's spellchecker', but now he makes his own tests using Google forms and Flubaroo. Students can use these resources in class, or if they have access to a mobile in their family they can do follow-up activities at home.

Ranjitsinh has spent a lot of time providing the children in the school with an introduction to different technologies and they are now also working with QR codes to link materials to the curriculum.

Challenges

Ranjitsinh explains: 'The biggest challenge was to build awareness with the parents about education and try to reduce the girls' absenteeism. I am from a drought-prone area of Maharashtra and parents were completely unaware about the importance of education. In the early stage I had focused on three major issues:

1. lack of awareness about importance of education
2. absenteeism
3. lack of quality education.'

Ranjitsinh has started to tackle these challenges. In order to increase parent awareness around education and decrease absenteeism his focus has been on ensuring continual interaction with the community as well as initiatives like 'alarm on, TV off', a Google

SMS channel called 'Ranjitsinh' and the creation of a 'Baalak-Palak' WhatsApp group. He also gets his students to give presentations in parent meetings as a way to create a bond between students, parents and teachers. He has begun to provide quality education by adopting project-based learning, developing and collecting digital content, using communicative activities, using puppets and encouraging the use of QR-coded textbooks beyond the school gates.

What Ranjitsinh observed

Ranjitsinh has noticed a lot of changes in his students. Some of them are behavioural and attitudinal, but many involve creativity connected to the technology. As well as creating QR codes for learning processes, recording poems, making video recordings and PowerPoints, they are now developing digital content using mobile-based apps. They are also communicating more effectively – listening, viewing and responding to one another and communicating with other groups in the school.

The way forward

The Government of Maharashtra has now recognised the value of this project and started to print QR-coded textbooks from June 2016. All the textbooks of Standard 6 (Marathi-medium) are printed with QR codes. This project will now reach 1.8 million children in the state of Maharashtra.

To find out more

- <https://www.youtube.com/user/onlyranjitsinh>
- <http://timesofindia.indiatimes.com/city/pune/ZP-teacher-to-share-tech-knack-with-counterparts-in-Thailand-Malaysia/articleshow/55655749.cms>
- <https://sites.google.com/site/zerotricks2/home/google-sms-channels-send-sms-text-messages-to-your-group-for-free>
- www.flubaroo.com

PROMOTING LEARNER AUTONOMY FOR CHILDREN WITH SPECIAL EDUCATIONAL NEEDS

RADHIKA ZAHEDI

Teacher



Grade: 11–12

Subject: Non-traditional subjects

Location: Mumbai, Maharashtra

School type: High-income private

Introduction

Radhika Zahedi works in Mumbai in a K-12 school for learners with learning difficulties, with around 50 children. The school is exploring the use of Massive Open Online Courses (MOOCs) on platforms like Coursera and EdX.

The school wanted to promote:

1. access to high-quality knowledge, relevant to students' interests
2. independent learning skills.



(c) Radhika Zahedi

The teaching process

Radhika's school wanted to offer a differentiated programme for their learners. With MOOCs they were able to offer history of art, Scratch programming and cooking, among other subjects. Through the MOOCs they were able to show students how they could access high-quality knowledge for free, and the teachers were also able to support them through the learning process in a way that promoted autonomy.

First of all, the teachers chose a MOOC called 'Learning how to learn' which the students did along with the two teachers in charge of the programme. The teachers picked this course because it was relevant to the personal development of the students and teachers and it had received a high rating on Coursera. The course covered learning approaches that were backed by neuroscientists and brain research. Their goal was to model to students how they might use a MOOC platform effectively, i.e. how to pace themselves, how to engage in online discussions, how to organise and save relevant material, etc.

Radhika's comment

'We had not really understood the power of MOOCs and technology until we actually started doing the course. My students have reading difficulties and usually find it hard to process a lot of information in text formats. But the MOOCs were different! Thanks to the MOOCs, which gave me the material in a series of three- to six-minute videos plus a short formative quiz, my students were able to access the implications of brain research on effective learning strategies better than I had ever seen. The videos were powerful and the students could replay them as many times as they liked.'

The quizzes check for key concepts at the end of every video and provide corrective feedback. My students were so engaged and had rich discussions throughout this course. They completed all the home study assignments enthusiastically. The course took us about five weeks to complete. I have been a teacher for ten years, but I know this experience will have a huge impact on my teaching practices.'



Challenges

When the teachers exposed their students to the various MOOC platforms, they realised that the students would have a hard time choosing courses that were 'just right' for them, not in terms of interest areas but in terms of difficulty. There were large variations in terms of prior knowledge required, time commitment and format (e.g. how much video and how much reading). Some courses required heavy assignment submissions.

What the teachers did to at least partly address this was to create a rubric that students had to fill in, which helped them collect data on the requirements of the course and then reflect on their current schedules. For example, the teachers would have them collect data on 'Course rating', 'Time commitment', level 'Beginner/expert', etc. and then present a rationale for their choice with a sample schedule before making their final decision.

What Radhika observed

Radhika noticed two major areas of impact for the students:

1. **Motivation and independence:** 'My students were so motivated that after the first course they started to enrol in MOOCs that interested them and completed them in their own time. They would look up courses and ask my opinion on which one they could take. One of my students would watch the content of the following week in advance and would watch it a second time with us in class.'
2. **Depth of learning:** 'Because the course material was developed by experts in the field, the ideas were presented in a logical manner, with lots of examples and analogies. This allowed my students to understand the concepts in a deep and transferable way. When they were asked to do a presentation on the key ideas of the course at the end, I was so surprised to see the insightful

connections they had made to their own lives. In the previous two years I had taught them science and had never seen them present learning in such a meaningful manner.'

And one for herself:

3. **My own learning:** 'I have used so much from the MOOC format in my own professional development sessions. My delivery of workshops now incorporates the quiz format (on Google forms) for participants to digest key concepts.'

The way forward

'As a high school teacher, I think MOOCs can transform high school education. I know that there are other high schools out there that are already leveraging the power of MOOCs to provide rich, varied electives while simultaneously exposing students to skills that will allow them to be independent lifelong learners. In addition, our teachers have started exploring MOOCs as a professional development tool. We have started a MOOC Club for teachers and parents. Some upsides are the easy-to-use format and the availability of apps (EdX and Coursera) allows you to access them on the go.'

To find out more

- <https://www.coursera.org/learn/learning-how-to-learn>
- <https://www.coursera.org/learn/presentations-speaking-so-that-people-listen>
- <https://www.coursera.org/learn/intro-programming>
- <https://www.coursera.org/learn/graphic-design-history>
- <https://www.edx.org/course/information-communication-technology-ict-gtx-ict100x>

INTERACTIVE TABLET LEARNING FOR MATHS AND SCIENCE

ADITYA TRIPATHI
CEO, MarkSharks



Grade: 8–10
Subject: Maths and science
Location: Delhi
School type: All schools



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Introduction

Aditya Tripathi from the MarkSharks company, New Dehli, describes the work they are doing with the MarkSharks apps they have created. The apps are aimed at Grades 8 to 10 to support the teaching of science and maths. They are available for Android tablets and phones in a number of languages. They consist of both information about a topic and interactive elements that children are encouraged to engage with. One of MarkShark's key aims is to try to encourage more constructivist pedagogies in the classroom.

Why technology is being used

There is no prescribed way of working with these apps and teachers or students can use them as they want. In some cases the schools use the material to blend the teaching process. The teacher might explain a particular process then the learners can follow it up by exploring it further with the MarkSharks apps. A student at Sri Aurobindo School in Jodhpur says, 'sometimes, when the teacher teaches us something, we don't understand everything, but MarkSharks explains things very well, so our doubts get cleared.'

Pratibha, the science teacher, says, 'Science has come alive for them. We don't have too many resources in

school, especially related to science. But now we don't really feel the need for them. Children do experiments virtually, also removing the risk element that we would otherwise have to face in a real lab.'

When a child has finished a set of materials, MarkSharks's adaptive testing technology ensures that the test changes according to how well the learner does as they progress. The teacher gets results immediately and the students get feedback on the answers they got wrong.

How the technology works

Aditya explains how MarkSharks allows for personalised and self-paced learning. If children have



access to individual tablets or phones in class or at home, in these cases the teaching can be ‘flipped’, allowing more time in class to focus on discussing the issues that the apps raise about the topic under discussion. The material is audio-visual, interactive and game-like and includes simulations, animations and videos.

The MarkSharks team work with the school leaders, teachers and students in the following ways.

- **Teacher survey:** teachers fill out a brief survey on their prior experience with eLearning
- **Introductory teacher workshop:** introduction to in-class use of MarkSharks, product features, analytics, reports and various integration models
- **Teacher lesson planning workshop:** lesson planning workshop with teachers to illustrate how to integrate MarkSharks into the classroom. We create lesson plans with the teachers and show them how to go forward developing their own
- **Student survey:** students fill out a brief survey on their prior experience with eLearning
- **Student diagnostic tests:** students do a short test in science/maths and English to determine comprehension and learning levels
- **In-class student demo:** in-class introduction of MarkSharks to students through a demo lesson’.

Aditya says

‘The Indian educational system is producing thousands of children who know how to pass tests and exams but are learning very little in the process. Despite significant innovations in education technology, the process of teaching globally remains largely the same – unidirectional. We wanted to disrupt this unidirectional mode of teaching and learning. By digitising “learning by doing” MarkSharks is disrupting the current model of learning where teachers simply “talk” and children only “listen”. Students of the 21st-century must learn in a 21st-century way.’



Challenges

The challenges that occur are with the teachers as the children adapt very quickly. Teachers have issues with operating the tablets, running the app and thinking of ways to integrate the programme successfully into their teaching. Some teachers also believe the introduction of the apps will create extra work or that technology may replace them.



A teacher’s perspective

(Hemlata teaches maths in Gurgaon)

‘MarkSharks is a great option as children get to practise a number of questions of different types. Earlier we had to arrange these questions on our own, but now MarkSharks does it for us. Because of the attractive visuals, I feel that children now take more interest in the subject. Earlier children needed to be pushed to practise the questions given at the end of the textbook but found them boring and drab. But even the questions in MarkSharks look attractive, so they feel like attempting them. I think they are more focused while attempting questions in MarkSharks; their attention does not waver. Plus, I can feel a tangible improvement in their performance. Our students come from deprived backgrounds. Therefore their interest in the subject, because of the MarkSharks programme, has increased a lot.’

The way forward

To get teachers to use technology in schools they need to see learning benefits and be able to integrate the tools directly into their teaching. Students are likely to be attracted to these tools and their enthusiasm can also help to persuade teachers that it is worth trying.

To find out more

- www.markssharks.com

VIDEO CONFERENCING AND TEXT-BASED DISCUSSION

SHRUTI SHARMA
Teacher



Grade: 10–11
Subject: English and life skills
Location: Ghaziabad, Uttar Pradesh
School type: High-income private



© Arunabh Singh

Introduction

Shruti Sharma works in Ghaziabad in Uttar Pradesh in the north of India. It is a co-educational school which serves children from pre-school through to senior high school. Shruti works in grades 10 and 11. She teaches English and life skills. In her classes she makes use of video conferencing and text-based discussions, on a platform offered by Generation Global, to connect to classes in other parts of India and also abroad (Italy and Indonesia, so far). They engage in exchanges on different topics which helps to enhance both her learners' digital literacy and their social skills. The project has been running since May 2015.

How it works

The sessions take place in a fully equipped computer lab which gives the students access to the necessary technology for them to engage in the video conference and to contribute text-based comments as a part of the online community. A video camera and speakers are connected to a laptop for the video conferences; students then share their opinions and come to a consensus. Before doing the video conferencing Shruti used methods like 'role play'

which work but do not always successfully achieve all of the learning outcomes.

Once an arrangement is made to run a video conference the students start by brainstorming the topic and doing further research. Shruti also does some class inputs on the topic and discusses the protocol for the video conference.

During the video conferencing sessions the students



sit comfortably facing the screen so that they are ready to discuss the topic. As well as discussing ideas they are also developing their speaking and listening skills.

After the class there is a reflection session where the students make a record of what they have learned, and then they work in small groups to exchange their opinions with each other and the remote group on the video conference text-based system. As facilitator, Shruti does not engage in the discussion but simply observes the process so that she can give feedback at the end.

Challenges

Setting up the video conferencing system and getting access to high-speed and high-quality broadband connections have been the chief issues that Shruti's school has faced. They also needed to secure technical help in case a call got dropped in the middle of a session. Working with other countries has also been difficult because of the difference in the time zones. A lot of training sessions were conducted to ensure that actual dialogue will happen on the day of the video conference. Confidence needed to be built up.



What Shruti has observed

Shruti says, 'The use of technology has made my students more confident for sure. They are now willing to take up challenges without hesitation. Learners are now proactive and dare to initiate new endeavours. Through these sessions, students get the skills and experiences to flourish in an interconnected and complex world due to which there is an immense change in the learners' skills and attitude. Their willingness has now transformed from 'to do' into 'can do' statements. The learners have become more tolerant and respectful, generating and moving



a step ahead towards global harmony. Initially, I struggled with the system but have now learned and embraced the learning from the children. Thus the teacher-student relationship has definitely improved. By observing and reflecting, the skill set and dynamic in the class has changed for the better. These welcome changes are evident by the postings the students have written and it is also reflected through their daily behaviour. These positive changes are making my students self-reliant and assertive. For me personally, I am more at ease with this teaching-learning approach.'

The way forward

Shruti says, 'I would suggest that other teachers can use these methods for building communication skills. These approaches will definitely enhance the confidence of the learners. Video conferencing with the students within the country and outside the country would definitely help each child to face the world outside. Team blogging is a good way to write up and share the opinions. In my view if other teachers combine academic sessions with these real-life experiences, they will make learners more interested, which would in turn help in gaining knowledge.'

To find out more

- <http://generation.global/>

WHATSAPP COMMUNITY OF PRACTICE (CoP) FOR TEACHERS

PRAVEEN KUMAR SINGH
Teacher

Grade: 7–12
Subject: Maths and science
Location: Mysore, Karnataka
School type: Government school



© Swami Vivekananda Youth Movement

Introduction

Praveen Kumar Singh who works in Mysore district in Karnataka in the south-west of India reports on an initiative that is making use of a WhatsApp group linked to a science teachers community. The project currently involves 87 teachers from at least 70 schools.

Why technology is being used

Heggadadevana Kote (HD) *taluk* (an administrative region) is considered a very deprived region of Karnataka with a severe shortage of teachers in government schools. The morale of the teachers is believed to be low and the teachers do not feel that they receive much support to help them in teaching. To strengthen science education, a forum for teachers was created to promote learning and sharing about science and science teaching. This was a voluntary initiative and led to the formation of a WhatsApp group. The group discusses topics based on the curriculum on a weekly basis through audio, text, photos and videos. The use of the WhatsApp group has now spread across the district.

How it works

The forum – Vijnana Vedike Kote (ViVeK) – was started to promote interaction among the teachers

to learn from each other's experiences and to allow geographical challenges to not be a limiting factor. It was observed that science education was limited to lectures and encouraging the students to obtain just enough marks to pass their examinations. The goal of the initiative was therefore to improve the quality of science education in the government schools of the 'taluk' through capacity-building activities for the teachers. By encouraging the teachers to clarify their doubts, it was intended to create a conducive environment for the teachers to ask more questions and promote hands-on learning.

Starting with simple daily updates, the WhatsApp group became a vibrant discussion group with one topic being discussed every week. Every Sunday the topic for the week, which has been decided by a group of the teachers, is announced and the teachers send in their questions to the moderator (an expert



nominated by the group or someone who volunteers) by the Thursday of the following week. The expert then moderates a discussion on the Saturday night based on the questions received. Being a Saturday night this was in the teacher's own time. The bilingual discussions focused on addressing the conceptual gaps of the teachers with the support of audio clips, sketches, videos and text messages.

The group slowly evolved guidelines on how the discussion could be moderated. Praveen argues that the use of WhatsApp has helped the teachers communicate with each other. These discussions are complemented with hands-on sessions and all the information is archived and shared over Google Drive along with a series of articles on a blog. The group started with about 20 teachers in 2014 and there are currently 87 members. On average about 30 teachers actively participate in the weekly discussions.

Challenges

Establishing the forum initially faced three challenges:

- 1. Usage of smartphones among teachers:** this was low and to convince the teachers to invest in a phone was difficult at first. This issue was tackled over several months by seeking the support of early adopters to exert pressure on other teachers to see this as an investment for their professional development.
- 2. Connectivity and bandwidth:** a lot has changed over the last three years in the rural areas in terms of connectivity, although this continues to be a challenge in a few areas.
- 3. Archiving and public access:** a new member of the group would not be able to access the discussions held earlier in the group and the group itself is limited to 250. They now archive the content on Google Drive and this is shared more widely.

What they observed

Praveen says, 'The results have been very encouraging. There is a tangible increase in the interest levels and confidence among the teachers in handling classes based on the topics which have been discussed. The teachers actively meet once a month at one of the schools and participate in hands-on sessions. The teachers have carried these

experiences back to their classrooms. The teachers themselves now feel that their classes are more interactive and activity based. The perception that science is a difficult subject is also on the decline and it can also be observed in the increase in the number of admissions into the science stream after 10th grade. The approach of the teachers has also shifted from a marks-oriented one to a learning-oriented one. The most satisfying of all is the enthusiasm among the teachers and the desire to learn more. Four teachers have now prepared a handbook on one of the topics to address the conceptual gaps. The handbook has become very popular among the other teachers.'

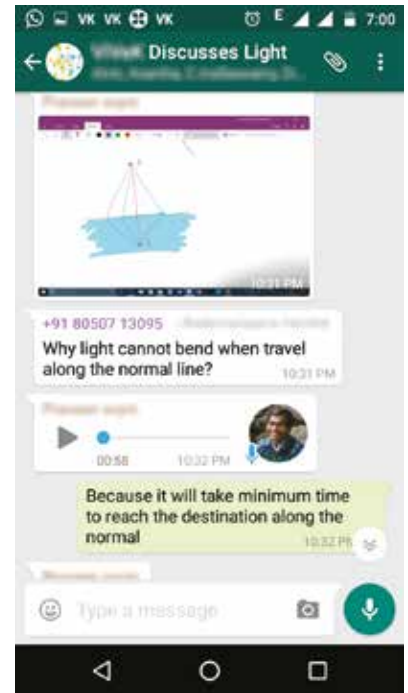
Through the online materials the group are reaching over 6,000 teachers across the state through a number of platforms.

The way forward

Praveen proposes that 'this model can be implemented by other organisations as well. Building a strong rapport among the participating teachers and the moderators is key to the success of this model. Complementing the online discussions with a set of other activities for getting to know each other might also be necessary. This model cannot be scaled rapidly and the discussions are also not fruitful in larger groups. It has been observed that more than 20 active members in a discussion group becomes difficult for the moderator to manage.'

To find out more

An example handbook can be found here: <https://janabandi.wordpress.com/>



GAMIFIED MENTORING APP FOR TEACHERS

AMRUTH B RAVINDRAN
CEO, Guru-G Learning Labs



Grade: 1–12
Subject: Maths, social studies, science
Location: Bangalore, Karnataka
School type: Government and low-income private



© Guru-G Learning Labs

Introduction

Amruth B Ravindran of Guru-G Learning Labs is based in Bangalore which is the capital of Karnataka state in south India. Amruth reports on the app they have developed to provide support for maths, science and social science in over 400 schools, covering both government and private schools in their region. The app is not targeted directly at children but is designed to support and develop teachers.

Why technology is being used

Amruth says, 'The adoption of digital content and platforms has failed to create a significant improvement in student performance around the world due to teachers not being trained or equipped to use them the right way. Guru-G believes regular mentorship and hand-holding is the solution that has worked most effectively to address this issue, as opposed to one-time or infrequent teacher training workshops. However, it is not feasible to provide a human mentor to every teacher in the world. We want to solve this problem of teacher quality/ training by providing an app that can become their daily mentor for discovering new practices as well as knowing what more they can do to improve student performance in their classrooms. Further, one of the biggest challenges faced by most principals and school leaders is finding, training and retaining quality teachers. We are also working towards making this process as easy and interesting as possible for the

school leaders, which will ease their daily burden and confusion.'

How it works

Amruth says, 'Teachers use our app to discover new teaching ideas and lesson plans around topics in the curriculum. The app also recommends to them which lesson plans and teaching practices are more likely to improve student outcomes based on past research evidence as well as student assessment data from their own classrooms. We also gamify the experience of teachers by analysing their own practices and providing visual feedback meters, points and level-up mechanisms as a part of the user experience.

In addition to these features, we have recently introduced the ability for teachers to create and share new teaching ideas from their smartphone or laptop so that they can share and discuss teaching ideas and best practices with other teachers at their school or



within their network. Our app also allows students to access the digital content that the teacher used in their classrooms or in their lesson plans via a student app that they can use at home. We also regularly generate a fun quiz for students based on what the teachers teach in their classrooms. This allows the teachers to know the impact their teaching is having on student learning and performance. We also use this information to fine-tune our recommendation engine so that it can make better recommendations to teachers on which type of lesson plans are likely to work well with their students.'

Challenges

Amruth reports that 'the biggest challenge during the early days was to figure out the right product experience that will make teachers use it frequently and voluntarily. Everything – from designing the right user experience, integrating research findings with existing everyday habits of a teacher, reducing preparation and documentation effort for teachers and making them realise it within a few minutes of seeing the product as well as gamifying the experience for teachers – had to be learned by continually prototyping and seeking feedback from teachers over the last three years of our journey. The other major challenge area has been to reduce the amount of initial effort and training it takes before a school or teachers can start using the product daily within their school.'

What they observed

Based on an independent standardised assessment of reading, writing and maths with a sample of over 900 students, Guru-G suggest that there has been an 86 per cent improvement in student outcomes after teachers started using their app. Among their sample teachers, the regular usage rates of the app is 68 per cent with the number of sessions taught by teachers using the app being over 150,000.

Currently they do not get good data of use by students, so they have adjusted the app to better

track student usage rates and also performance on specifically designed quizzes.

A teacher's perspective

Shruthi TS who has been using the app for over a year says 'Teaching has several challenges and we need to continuously find creative ways of teaching to keep classes interesting. The Guru-G app has lesson plans with several teaching methods for every topic and has helped me in planning my classes better. I can select the teaching methods that I like and prepare for every class. While teaching in class, I can also make use of the videos, pictures and presentations available on the app and share this with the students.'

Shruthi further adds, 'All the lesson plans available on the app are as per syllabus. It also automatically shows me the progress I have made when it comes to covering different portions. I can easily keep track of activities in the classroom. This has greatly reduced manual work in creating weekly logs. Introducing technology has also made students more attentive in class. I feel that this can greatly complement and support our teaching practices.'

What others can do

Other organisations, schools or individual teachers can adopt the app. Organisations can publish their own content to make the app personalised, gamified and analytics-friendly for teachers. Teachers can use the app to discover new teaching ideas or share their own teaching ideas with other teachers in their schools, discipline communities and other organisations. They can also use it to analyse their own teaching practices and know what appears to be working well and what can be improved either at an individual teacher level or at an organisational level.

To find out more

- www.guruglearning.cp

DIGITISING DELIVERY OF TEACHING AND LEARNING AT NIGHT SCHOOLS

HARSH TIWARI

Volunteer, Barefoot College



Grade: 1–9

Subject: English, maths and science

Location: Tilonia, Rajasthan

School type: Night school



© Barefoot College

Introduction

Barefoot College, based in Tilonia in Rajasthan, north-west India, has reached out to marginalised communities in seven different states – Karnataka, Bihar, Rajasthan, Uttarakhand, Orissa, Gujarat and Andhra Pradesh – through night schools run by the organisation and their partners since 1975. Teachers and students in the night schools now use innovative digital learning tools to teach and learn literacy, democratic values, environmental sustainability, analytical skills, creativity, mathematics and science. The Barefoot College team are also creating a module that will help teach these children programming skills.

Why technology is being used

Barefoot College added a digital dimension to more traditional knowledge delivery in their night school system. The use of technology allows them to improve attendance, introduce coding and enrich mathematics, English and the practical sciences. Tablets allow teachers to monitor the progress of each child. Most importantly, children and teachers can develop relevant content, telling their stories and sharing their experiences with others.

How it works

These night schools provide traditional and relevant

education to rural children who are unable to attend school during the day due to responsibilities such as farming. Children aged between six and 14 gather for three hours each night. Through a five-phase implementation plan, Barefoot College introduce a tablet for the teacher at each school, a solar-powered projector and ten tablets with headphones for the children. The implementation plan is customised for each school based on various factors like teacher capability, the age of the children, the context of the village, current levels of education and the preferred learning styles of the children. Basing their teaching on various models, the teacher prepares his or her



© Barefoot College



© Barefoot College

own modules instead of relying on readymade content or apps, which results in more personalised curriculum development and also supports the teacher's professional growth. The teachers go through intensive training on how to teach and how they can use the digital intervention.

Measuring impact

Teachers who have worked on this project say that attendance is even better than before. There is more discussion in class and more questions from the children. More parents come to the school to see what is happening, how the tablets are used and how their use might be extended.

A teacher from the project says, 'We do an evaluation of the children every month to see how much progress they have made. We see the children doing much better than earlier and picking up concepts faster. I have much more fruitful interaction with other teachers. We discuss teaching methods, teaching aids and content creation. The inclusion of digital tools to support traditional learning has made all of us feel more capable and confident.'

Challenges

Harsh Tiwari argues that like any other disruptive innovation, introducing digital tools into a 40-year-old education system requires a mindset change and awareness-raising for teachers and parents so that they understand how the intervention will benefit them all. As the team has been working on this project the implementation plan has included a number of workshops to address these issues. In addition, the team has faced some resistance to working with marginalised communities, specifically from the more powerful members of the villages who are used to being prioritised for new initiatives due to their position within society.

Data collection is also a challenge due to the spread

of locations across states and rural areas. However, the model takes into account connectivity, data collection and providing adequate support to the schools.

Harsh Tiwari's comment

'The digital divide is widening exponentially for rural communities who lack access to energy. They are increasingly cut out as more and more benefits, entitlements, subsidies and other programmes are migrated to digital delivery. We believe that every child in India must be digitally capable and aware, unafraid to engage with and be confident in using digital tools, especially the poorest and most marginalised children. The digital night schools will bridge the opportunity gap for rural Indians, providing opportunities to access relevant knowledge that can shift the quality of life for entire communities.'

A model for further development

Harsh Tiwari says, 'The Barefoot College has steadfastly adhered to a development paradigm that focuses on a partnership model, between individuals and communities. These elements are essential for helping to address the urgent and pressing issues facing the developing world. In working with large education foundations and academic institutions we hope to move towards greater advocacy as to why alternative models to fill gaps in government school structures are addressed by large institutional players. This is happening as exhibited by Apple India and Oracle's commitment to the digital night school so far.'

A teacher who has been working on the project thinks that because of the success with the children, they should start adult literacy classes and discussion on issues relevant to the community like pensions, identity cards and other topics.

To find out more

- <https://www.barefootcollege.org>

COMMUNICATION WITH PARENTS

SUCHI DAKORIA

Teacher



Grade: 1–5

Subject: Maths and language

Location: Surat, Gujarat

School type: High-income private

Introduction

Suchi Dakoria works in a school in Surat, Gujarat in the west of India where they teach the International Baccalaureate. As part of the teaching process they keep a portfolio of students' work as well as communicating regularly with parents as to how their children are progressing. The app Seesaw, an online portfolio tool (e-portfolio), is able to address both these needs simultaneously.

Why technology is being used

Seesaw can be accessed by teachers, students and their parents. As students' work is documented digitally it makes it easier for students, teachers and parents to review a child's progress over time and demonstrate their growth. It also strengthens the communication channels between parents and the teacher as they have a direct link to their child's work without having to wait for termly reports or parent/teacher meetings.

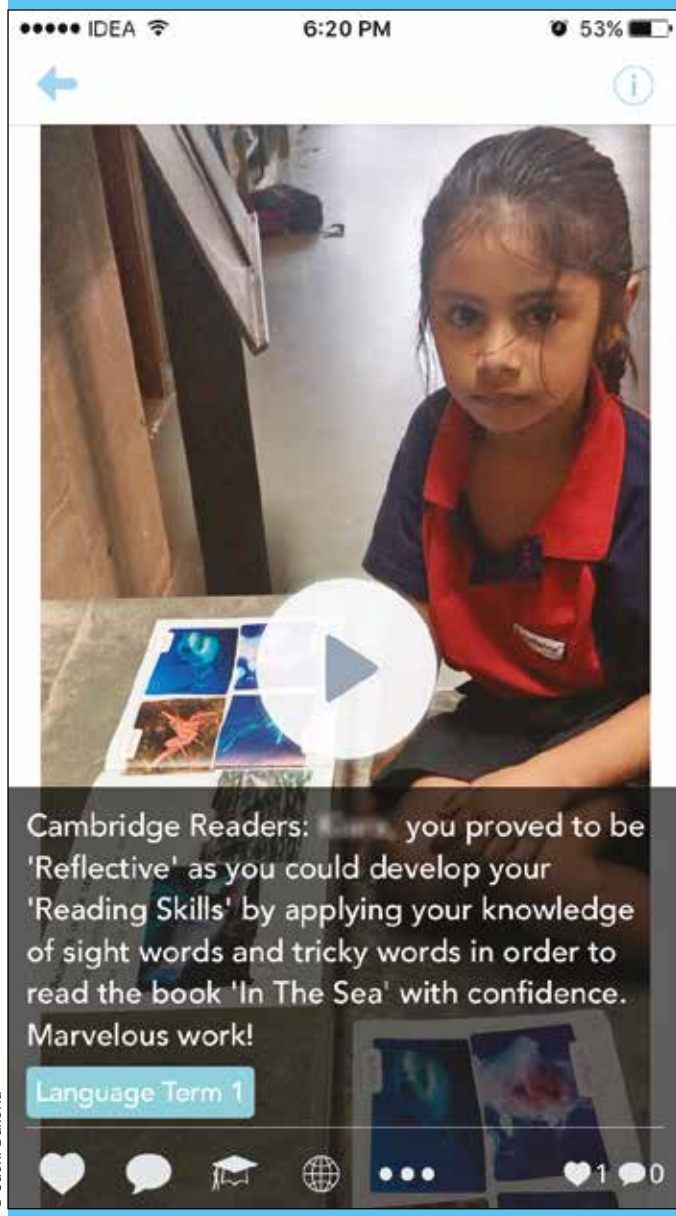
How the process works

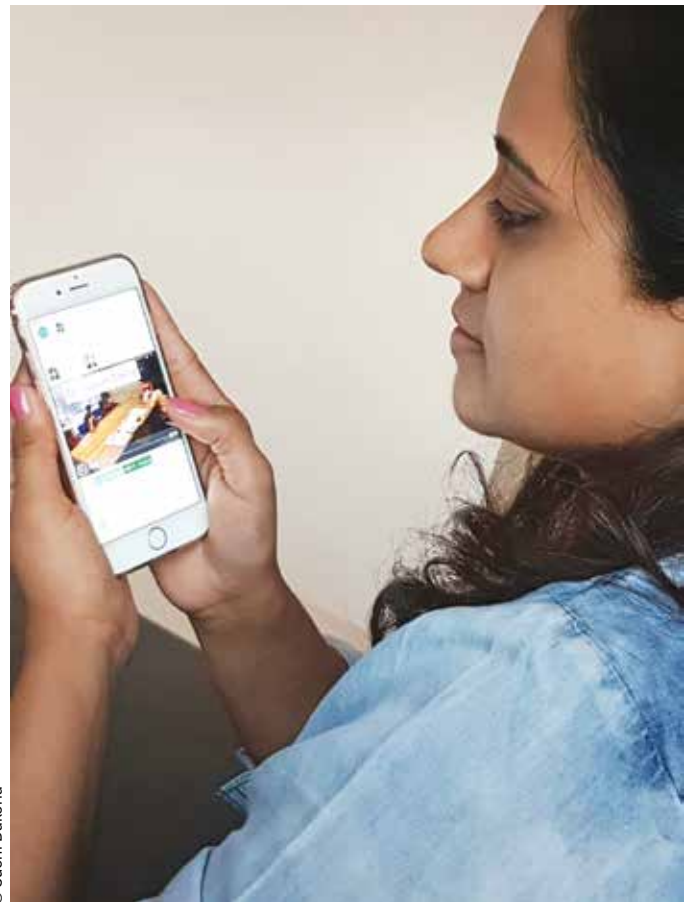
A teacher first creates a class by choosing their grade level, then student names are added to the class list. Separate folders for each subject are created in order to organise the portfolio. A unique QR code is then generated automatically, which is sent as a handout or mailed to each parent. The parents connect to the class by signing up to Seesaw and downloading the parent access application. The teacher then uploads various portfolio pieces for each child from time to time according to the need.

These portfolio pieces are accompanied with comments which can be in an audio, video or text format. These comments and portfolio pieces keep parents updated about what their child is learning and/or their achievements on a regular basis. Students can also take some initiative with their portfolio and upload a piece of their own choice through the class code. Teachers can even record a video when children are doing work and there is also the option to take pictures or post their illustrations. In addition, they can even do voice recordings so that students can reflect on their understanding about what they have learned during a particular learning activity.

Challenges

Suchi says, 'We faced a number of challenges when we introduced Seesaw, the first and the foremost being training the teachers to be able to use it effectively ... This was a challenge as not all teachers were equally proficient with technology and it took us some time to get everyone on the same page. The next challenge was teaching parents how to access and use the





application. For this we first sent handouts with instructions while keeping tabs of which parents were/ were not able to connect to their child's portfolio. For the parents who struggled to connect, we organised a session where they were individually guided through the application by teachers. Next was the essential agreements which ensured that no learning loss happened while taking pictures/videos/ audio. The teachers also needed to manage their time well in order to maintain their curriculum pace, for which we fixed a certain day for each weekly cycle wherein the teachers were provided explicit time to upload portfolios to Seesaw.'

What Suchi observed

'Since the introduction of Seesaw there have been a number of positive changes.

1. We have received many responses of appreciation from parents because they can have regular access to their child's academic world.
2. The students feel a deeper ownership towards their portfolios as their portfolio contains a wide range of media: audio, pictures and videos.
3. When students see a piece of their work sent by their teacher to the parent, they strive to work harder to achieve positive results and feedback.

4. Parental interactions with their children regarding their work have become much more regular. This is evident through their regular comments and likes.
5. The workload of the teacher has also been considerably reduced as the e-portfolio is updated on an ongoing basis meaning that at the end of the term there is no crazy rush to get everything together.'

What other teachers can do

Seesaw is a free application which any teaching organisation/teacher can easily use. It is available on all platforms, very user-friendly and eventually makes the sharing of student learning paperless and hassle-free.

To find out more

- <http://web.seesaw.me>

TECHNOLOGY PLATFORM FOR TEACHER DEVELOPMENT AND RESOURCES

DR MONA MATHUR

Founder, Million Sparks Foundation



Grade: 4–10

Subject: Maths

Location: Delhi

School type: Government and low-income private



© Million Sparks Foundation

Introduction

Mona Mathur reports on the ChalkLit app, designed to help support teachers in their content knowledge around the curriculum as well as pedagogy. The current focus is the mathematics curriculum, but they also plan to focus on the sciences and English. The platform also promotes interaction between teachers. ChalkLit is produced by Million Sparks Foundation which describes itself as a ‘Learning Network’.

Why technology is being used

The team at Million Sparks Foundation truly believes that teachers are central to the education ecosystem, and that impacting their availability, quality and capacity will directly impact the learning outcomes of children. Mona says, ‘We want to introduce this innovation with an objective to support teachers to plan their year-long schedule better, prepare better lesson plans, get enough time and material to prepare better for their class. We are aiming to help them deliver a better class each time. The technology we use is open source and is hosted on a cloud-based platform which can be very easily scaled.’

How it works

ChalkLit is a technology platform which runs either through a mobile app and/or via a web browser on

a standalone computer. The teacher selects the subject and the grade they teach to access the annual planner. The annual planner:

- details the breakdown of the year into various chapters or concepts based on the NCERT/CBSE curriculum
- provides the recommended month in which this chapter has to be taught
- provides the number of periods that the chapter has to be covered in.

The teacher can then select the topic that they need to teach. The topic provides high-level inputs to the teacher showing why the topic is important and its real-world connections. It explores the various concepts that are a part of the topic, ways to teach it and what might be some of the difficulties or

misunderstandings with the topic. Most of this material is explained by the use of specially created videos.

There are various activities that can be undertaken in class to reinforce learning among the students, some assignments and questions which can be asked of the students or assessments and worksheets that can be given to the students. While all this material is provided, the teacher is free to select her approach and conduct the class in the manner best suited for her own group.

Mona Mathur explains, 'This material provides a comprehensive treatment to each topic which can enable the teacher to conduct a class to the highest standards. Several teachers have started to take printouts of the provided worksheets which the teacher fills in and then the students can attach these to their notebooks once they complete them. The teachers can also respond to comments and interact with each other and provide comments. The platform also provides training in concepts which span across grades to improve a teacher's conceptual and pedagogical understanding.'

Challenges

Some of the key challenges were getting the teachers to understand that their jobs were not threatened by the app and that they were needed as facilitators in order to make the programme work.

What Millions Sparks Foundation have noticed

Mona says, 'One of the clear pieces of feedback that we have received from our teachers is that previously they used to have a fear of maths, which has now disappeared and they feel completely comfortable with maths. We see a significant number of our teachers looking regularly at the content provided by ChalkLit. They not only consume the content on ChalkLit they regularly comment on it, making observations and leaving valuable suggestions that we are incorporating into the product from time to time. We also see teachers discussing the app and sharing details of the app in sessions where teachers share innovations that are useful in their classroom.'

We are also seeing groups of teachers being formed. In these groups one of the teachers – particularly the senior teacher or teachers with a smartphone and data connectivity – are taking the lead and introducing ChalkLit to others. These teachers groups are useful for teachers to access content together and discuss the same, as and when they access it. There are instances when tutors known to teachers or teachers who take tuition are using ChalkLit to understand the concepts better. These tutors have approached the



© Million Sparks Foundation

A teacher's perspective

Meenakshi Sharma teaches maths in Delhi

'I am using Chalklit for maths which I can access on my mobile. I always use it before I start a new chapter and take some of the most useful content according to my students' levels and needs. From this app I can get videos, lesson plans and an agenda about all the periods and time periods; it is really easy to use. Since using it, my students are now asking questions when they don't understand, are more interested in maths as a subject and they are now doing their homework.'

Million Sparks Foundation to seek permission to use the application. They have been pleasantly surprised on being told that the application is free to download from the Google Playstore.'

What others can do

Other schools can encourage teachers to make use of the app and to join in with the teacher communities to help the company develop the material further, which most users are keen to do.

Mona points out that 'one of the schools got software installed on their PC which allowed them to download Android applications onto the PC. The school paid Rs 2000 for this software to a third party. They did this since they were interested in showing some of the material on the ChalkLit app in their Classroom using a projector. We have since then implemented a web version of the platform too.'

To find out more

- www.millionsparks.org
- www.stireducation.org

BRIDGING THE EDUCATION GAP WITH VIDEO CONFERENCING

JESSY JOY

Manager International Grants,
Plan India



Age group: 15–25

Subject: English, maths, science

Location: Jharkhand

School type: Learning centre



© Plan International (India Chapter)

Introduction

Jessy Joy works for Plan India who work with vulnerable and excluded children, their families and communities. The project described here focuses on girls living in urban communities who commonly drop out of education early, particularly as they get higher up in the school system. The project has been piloted in three urban resettlement clusters and in the slums of Delhi.

How the process works

The project takes place in local community centres, which are hired for this purpose. The project uses an interactive video conferencing facility with a smart board with recordings and some offline materials. The core topics are English, Maths and Science, Personal Development, Human Rights and Gender, Adolescent Reproductive Sexual Health, and Career Counselling. The technology augments the regular learning model with digital elements, giving the girls increased access to technology that they would not come across normally.

Teachers work with already existing materials. The video session is screened to 15 learning centres through the internet. A local learning facilitator helps to support the process in the individual centres.

Children interact with each other and the teacher through microphones and speakers to ask questions and solve doubts. The project is now experimenting with individual blended learning models by using cloud technology in three classes. This is part of the global Connect To Learn (CTL) programme of Ericsson. This model looks at developing the teachers as much as the learners. The centre facilitators are provided with training to support the learners in the CTL framework.

Why technology is being used

Jessy explains how 'technology was an obvious solution to reach out to the multitude of girls at one go. The aim was not only academic support but to build confidence and assist them in making informed choices in further learning. The project proposed, with the optimum use of technology solutions, to



open up a new realm of possibilities for young girls to access learning opportunities while sitting within their communities.'

Challenges

The unavailability of high bandwidth internet facilities in the implementation geographies was a key concern for the project. Urban slums generally only have access to low bandwidth internet connection for personal usage or small internet cafes, so the project faced a lot of challenges in securing a suitable internet package. This intermittent data connection also caused some drops in the video/audio transmitted to the centres. Plan India and its partners solved this by engaging with local cable providers to provide unbroken internet content. Procurement and maintenance of hardware was another big issue, especially with the centres being in leased spaces in the community. Plan India solved the issue by leasing out the entire hardware set-up.

Jessy says how 'the concept of sitting in a classroom where you can only see a teacher through a television screen was quite a new one for the parents of the girls in the slums. Although the girls were excited from day one, parents were slightly sceptical about the quality of teaching through this mode. It took Plan India a number of interactions with the parents, sometimes simulating learning sessions for the parents, to convince them of the effectiveness of the model. Of course the change in the personality of the girls and the confidence in which they conduct themselves was a big convincing factor.'

A teacher's perspective

Jyoti Kandary

'The technology is awesome. I can reach out to more than 400 children at one go. Normally it is difficult to teach the gender equality module virtually as it has lots of activities. So when I agreed to teach the Champions of Change module here, I was quite sceptical of the results. I must say, though, I was pleasantly surprised. It

is quite easy to use the system for the teacher as well as the student. Internet connectivity helps us to lessen the burden on the teacher to take repeated classes. Each class is recorded and can be replayed in case students in a particular centre want to revise the topic.'

What Plan India observed

Jessy adds, 'Using technology to conduct and assimilate learning was new for both the teachers and learners involved in the project. Hence both eagerness and scepticism regarding the initiative were high during the start. However, we have seen a tremendous change in both the teachers and the learners during the past year. Teachers are more confident in discussing difficult topics through virtual means. For the learners, they are exposed to academic support and other personality development and leadership modules through this medium. This has led to a significant change in their attitudes and behaviour along with an improvement of their grades. It is critical to note that this initiative was launched to amplify learning opportunities for girls and develop them to make informed choices about their future.'

The way forward

The solution is replicable and expandable, but critical preparation would include a location for housing the set-up and a high bandwidth data connection. This model could be housed in a school to access additional materials. Using cloud-based content would also make it easier to provide standardised content. Although the current project operates in a pure grant mode, other agencies could look at a fee-based structure while looking at replication.

To find out more

- <https://www.youtube.com/watch?v=S5T8HDuKzDM>
- <https://planindia.exposure.co/bridging-the-education-gap-via-technology>

USING TEACHER-MADE VIDEOS TO SUPPORT LEARNING

RAJESH KOULURI
Teacher



Grade: 1–8
Subject: All subjects
Location: Vizianagram, Andhra Pradesh
School type: Government



© Rajesh Kouluri

Introduction

Rajesh Kouluri works as a primary school teacher in Vizianagram District in Andhra Pradesh in south India. He teaches all subjects to grades 1 and 2 and English to grades 4, 6 and 8. Rajesh's school is quite isolated and many of the children are first-generation learners. Rajesh has created a large number of videos to support the curriculum.

Why technology is being used

A key aim is to help the 80 per cent of children in Rajesh's classes to learn some of the learning basics that they need to progress through the school system. These children joined the school aged five with no previous educational experience and in some cases a lack of support at home due to a variety of reasons. It is difficult for these children to even reach the minimum standards expected in class. The use of video provides some of the extra support that they need.

How it works

Rajesh uses videos in different ways with different classes. With younger grade levels, Rajesh divides

his class into two groups. He plays the videos to the children who have little or no educational background. These children view the videos once or twice, repeating what they hear, and he then works with them one to one on their reading. While one group of students is watching the videos he introduces new topics to the other group who have a stronger foundation of skills. He believes that making use of the videos helps give the children with no educational background access to the coursebooks and content that are at the core of the curriculum.

Developing reading skills: decoding

To teach Telugu, the state language of Andhra Pradesh, Rajesh has created animated videos in



which the letters appear one after another and then a picture of the word. For example with the word PALAKA (పలక-SLATE) in Telugu, first comes ప (PA), next ల (LA), next KA క and then SLATE picture. The children watch these videos on a tablet, and read and listen to the audio. Later he asks the children to write the words down to check their memory.

Developing reading skills: comprehension

When Rajesh teaches English to higher grades in the school he plays videos showing sequences of images which are based on the coursebooks to the whole class and asks the children to interact with the pictures being shown. Later he gives the students the text from the coursebook on small slips of paper for the students to read and understand and asks them to match the slips of paper to the phrases or sentence in the coursebook.

He also stops the video and asks the children what is happening on the screen. Later he plays the videos again and asks the children to tell the story. He says that the children can recite the story because the lesson is split into small reading blocks connected to the pictures in the video. The children also do writing exercises based on worksheets that he designs. Rajesh records videos of the students working and plays these back to them. This helps them to see the progress they are making.



Challenges

The biggest challenge that Rajesh faces is the one that he is trying to solve: mixed-ability classes. In comparison, any challenges faced in implementing the technology have been minimal.



What Rajesh observed

'I have noticed a clear change in my children and my professional development. I have been recording each and every child's progress in reading, speaking and writing skills by preparing relevant worksheets to assess my children's learning. My second grade children can read English and Telugu very fluently and my class average attendance has reached 98 per cent after using these videos.'

The way forward

Rajesh believes that the introduction of a few tablet computers in the classroom to show the videos can make a significant difference to children getting access to schooling. He is hopeful that the work he has done has helped other teachers in the community to achieve similar results. Rajesh posts his videos online on a blog page and also has a Facebook page and a WhatsApp group to share ideas.

To find out more

- www.rajclassroom.blogspot

TEACHER DEVELOPMENT USING RECORDED VIDEO

MARIYAM BAXAMUSA

Teacher



Grade: 1–12
Subject: All subjects
Location: Surat, Gujarat
School type: High-income private



© Mariyam Baxamusa

Introduction

Mariyam Baxamusa works in Surat, Gujarat in the west of India. She works in a K–12 school that uses technology across all age groups and subjects. They also use technology as a tool for teacher development, particularly for inducting and mentoring new teachers into their school.

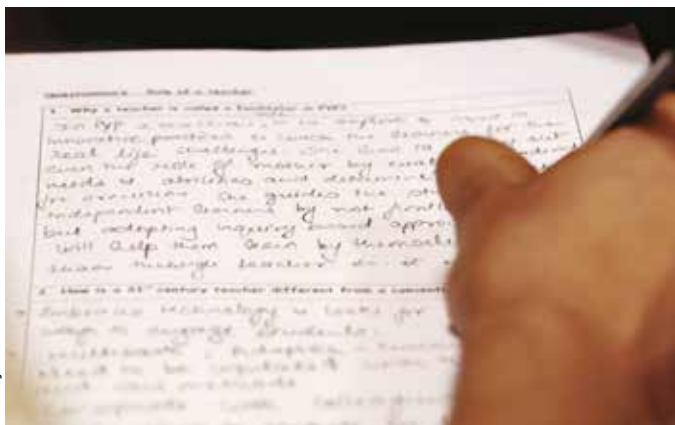
How it works

Mariyam says, ‘Training teachers to adapt to a new school is a considerable effort. Getting the new ones on board with everyone else in terms of the school’s culture, pedagogical practices, etc. requires a dedicated process. The recruitment programme by default is dynamic and needs-based. Teachers are appointed in groups or individually. So, training them all to meet the needs of the organisation, in the exact same, precise impactful manner was a huge challenge.’ Mariyam explained how they made short videos of their expert teachers in action; these were recorded during class time or on field trips. They also used staged interviews as well as simulated classrooms to ensure that they covered all of their training requirements. Then, to demonstrate the school’s philosophy and values, they asked the head of school and deputy to present their views. They

also asked their learners to share their experience of their classroom activities too to help the new teachers understand better what their students expect from them and the school counsellors talked about managing misbehaviour in the classroom. Mariyam asserts, ‘We prepared the teachers for success by giving them handy tips for energising their classrooms, all of which they could watch at their own pace and time. They also completed questionnaires and tasks related to the videos to foster a better understanding.’

How technology is being used

‘We introduced CBT (computer-based training) where we recorded our expert teachers in action. We successfully managed to cut down on duplication of effort and saved time and resources. Our goal of getting the new recruits to embrace and imbibe



the school's philosophy and practices was achieved all through the click of a button/mouse. We keep updating our existing teachers with the latest Web 2.0 tools through in-house training.'

Mariyam describes an example. 'The video on "Making a language class interesting" was followed by listing the strategies and then going around the school observing these strategies in action, also including them in the (new teachers') demo classes towards the end of the training.'

Recording these sessions within the school premises with the teachers and learners has helped the new teachers visualise what their classrooms would be like. Technology has made this kind of teaching process possible. Using generic material from the internet would not have been as useful in this respect. However, they did not exclude other materials and included TED Talks, films and classrooms across the world to gain a wider perspective.

Challenges

Doing this is not without its challenges, Mariyam explains. 'Unlearning and relearning are far more taxing than actually learning new things; so was the case with our training sessions. Getting the teachers to learn how to use technology effectively was comparatively easier than asking them to innovate or change their teaching practice. Getting them to realise the need and importance of online classes, about the usability and effectiveness of Khan Academy and Google Classrooms was tough.

Another challenge was sometimes after recording entire sessions we realised there was too much background noise, or worse the voice had not been recorded at all. We then had to reshoot those sessions which was a waste of time and resources. Also our expert teachers were conscious of being recorded and our learners behaved differently during a recording and hence we had a lot of editing to do.

Our technicians had to be on their toes all the time. Our biggest obstacle was when our local server, on

which we had saved the videos, crashed and we realised the need for stronger and better backup and shifted our videos to the school's YouTube channel. All the setbacks just pushed us more towards getting it right, and it was trial and error with us learning from our mistakes and making better schedules, getting better equipment and most of all keeping a positive attitude.'

What Mariyam observed

Working like this also helped in training the teachers to use technology effectively in their classes, and getting the new teachers acquainted with Google Drive, sending emails, calendar invites, formatting documents, creating presentations, using the in-school app, posting on blogs, and Web 2.0 tools like Blendspace or Padlet.

They also made sure that these new teachers got hands-on experience of using tools like Khan Academy and Google Classrooms. The school has recently become a Google Chrome School with children using Chromebooks from Grade 5 onwards.

Recommendations for others

Mariyam believes it is important to make local materials for a particular organisation. She says that you need to get staff and children used to the idea of seeing cameras around the school, so that they will act more naturally when being recorded. Invest in good-quality audio and video equipment and a good internet connection to upload videos to the server. Planning is also an important consideration, keeping track of the interesting things going on in school which could be recorded.

To find out more

- <https://www.khanacademy.org/>
- <https://www.tes.com/lessons>
- <https://padlet.com/>
- <https://classroom.google.com>

CO-CREATING INFOGRAPHIC SUMMARIES OF TEXTS

PREMANAND EDWARD MALYAKKAL

Lecturer



Subject: English

Location: Calicut, Kerala

School type: College



© Premanand Edward Malyakkal

Introduction

Premanand Edward Malyakkal works in Calicut, Kerala, in the south-west of India where he teaches degree-level students English. He uses technology in a variety of ways to provide and create overviews of different kinds of literary material. One approach is to work with his students to create infographics as the basis for project work and summaries of key texts. This is done using mobile-friendly software packages.

Why technology is being used

Using visuals like infographics, Premanand felt that his students would be better able to understand difficult texts. There are about 245 regular colleges as part of the university group, and over 30,000 students registered for different courses in science, humanities, commerce and management. All have General English papers. Premanand's aim was to 'give maximum information to the maximum number of people using very basic and simple technology'. By introducing the software and processes that his students need to make infographics, Premanand believes the students will develop a range of skills that they will find useful in future.

How it works

Premanand teaches his students basic computing skills and some core applications like word processing, database management and spreadsheets. He later introduces design skills, infographic making, content creation for blogs and website development. He teaches these based on the students' interest.

Enthusiastic learners are encouraged to use the computers available in the lab. Premanand has a Pro Account for the Piktochart software and students are allowed free access. The students are encouraged to try different free tools, many of which they can use on their mobiles.



At the beginning of the process groups were formed to encourage the students to work with a range of people who had mixed ability levels. Next, the students generated ideas and then the infographics were drawn on paper and illustrated with graphics. This is where the mixed groups were particularly useful as people had different skills. For example, some were good at drawing while others were more interested in research and writing. Information for the graphics was taken from the library and the internet with a lot of the visuals being taken off the web. One particularly good infographic was a map of Kerala showing different landmarks and facts about each topic, for example the Bekal Fort and the Nehru boat race.

Challenges

Premanand explains that a number of challenges arose when first adopting and implementing this kind of technology. Issues around meeting deadlines had to be carefully considered. Technology was something some learners had not encountered before and therefore there was a slow uptake.

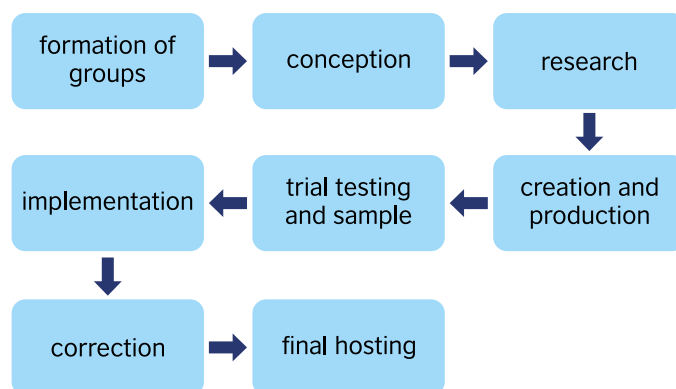
Premanand believes most of these problems have been solved a process of conception, creation, production, trial testing, sample implementation, correction and final hosting.

Premanand says

‘With these new teaching methods, I can more easily appreciate the levels of comprehension and usage of the language. Many students come from far away places to learn. They do not have access to technology. ICT-trained English teachers are still few. However, mobile phones are rapidly gaining ground. My objective was to make use of the smartphone technology, giving the learners simple solutions that can be accessed via their mobile device. They could access the materials and software from their

homes or even during their commute. I found that desktops and laptops were becoming scarce. Most students had mobile phones with them. With the decrease in data charges, more students had data packs and were using social media to a great extent.’

The process



The way forward

Premanand believes that ‘... all English teachers in schools and colleges can definitely use these technologies and find ways of adapting them in their situations. The teacher can be a facilitator and guide the learners to explore new possibilities and challenges.’

To find out more

- <https://piktochart.com>
- <https://www.canva.com>
- <https://www.teachingenglish.org.uk/blogs/racquel-gonzaga/using-Infographics-elt-classroom>

MOBILE LEARNING

ADAM KHORAKIWALA

Founder and CEO, mGuru



Grade: 1–5

Subject: English

Location: Mumbai, Maharashtra

School type: Government and low-income private

Introduction

Adam Khorakiwala from mGuru tells us about a mobile app they have developed to go alongside the K-5 English curriculum. They are currently working with a number of schools to encourage the use of the app.

How it works

mGuru English is a mobile English learning app for K-5. It starts with phonics and also includes grammar activities and stories. It is designed to provide support for the development of English literacy and is able to work on low-end devices. The app is interactive and has game elements, which are engaging and encourage the children to continue. mGuru English works without the internet and has local language instruction in Hindi, Marathi, Gujarati and Bengali. As well as people being able to download the app from the Android app site, mGuru also work directly with schools and parents.



© mGuru Edulabs Pvt Ltd

What they observed

Adam says, 'with teachers at Teach for India and Educo we work in a really simple way. We orient teachers on the app and all the content it covers, either in person or via a web session. Teachers are then free to introduce the app to their students, either by running classes with tablets or sharing the app with parents for at-home use. Parent sessions are short, between 20 and 30 minutes. Installations happen seamlessly offline via ShareIt. Once the app is installed and students begin using it, teachers can monitor progress on our teacher web dashboard, where all student activity and scores can be tracked.'

mGuru argue that their app enables anyone to make use of it, even on low-cost phones, and that it opens up the possibility for many more people to get access to similar learning material.

Why technology is being used

Adam explains how, 'mGuru is a valuable tool for teachers to accelerate the English learning outcomes of their students and tackle various learning gaps they might have. In developing country contexts and with second language learning, that problem is much more profound. Teachers can use mGuru to differentiate instruction by providing the right content to the right student. Student learning and progress is measured and presented to teachers, providing them with real time insights on how their students are learning. Furthermore, the app's interface and activities are designed to engage students and provide a fun learning environment, from learning with Motu to earning mangoes as they learn. Student engagement, personalized learning, and learning data are just a few of the various opportunities that mGuru English is able to present to teachers when they use our technology.'



Challenges

Adam says, 'There are a range of challenges that we have had to overcome: lack of connectivity, student engagement and retention, and ease of use. We've designed our app with all these constraints in mind. The apps work perfectly offline and can be installed and transferred offline via ShareIt, Xender or several other peer-to-peer mobile transfer apps. We've designed an engagement model with Daily Quests, a mascot, stars, mangoes, notifications and SMSs all with the goal of keeping students and parents using the app. Our user interface is a result of a lot of testing and several design iterations in order for it to result in something so easy that a child can pick up the app and quickly learn how to navigate and use it.'



and focus in the classroom, aside from the learning improvements that also transpire.'

The way forward

The app can be found in the Android store and is easy to access. mGuru is happy to work with teachers to provide teacher training and also to work with organisations to help them start using the app.

To find out more

- www.tfiindia.com/
- www.educo.in
- www.mguru.co.in/#home
- www.ushareit.com/

A teacher's perspective

Vishal DB – Teach for India fellow, Mumbai

'I have been using mGuru tablets in my class for about six months and the students know how to use the app better than I do, testament to the user interface being simple and attractive, both of which are essential for any software designed for kids. The gamification of the entire app keeps the kids engaged in a healthy competition with each other. It would serve as an excellent way to engage students who are more gifted or are struggling. The software gradually increases the rigour of the content, which makes sure that the student always receives challenging content at their level.'

What has changed

Adam says, 'The primary change for learners is how the app really engages and excites them. Kids are not only enamoured by the initial novelty of an app but continue to interact with the app over time. As they go through the activities and stories, they get measurably better results and scores. Teachers report that the student engagement results in more energy



WHOLE-SCHOOL INTEGRATION OF TECHNOLOGY

MONICA JOSHI

Teacher, Head of ICT

KOVLEEN MIDDHA

Teacher



Grade: 4–12

Subject: All subjects

Location: Ludhiana, Punjab

School type: High-income private



© Monica Joshi

Introduction

Monica Joshi works as the Head of IT at a senior secondary ICSE co-educational school in Ludhiana, Punjab in the north of India. The school is run by a private organisation. This case study provides a good example of how some well-equipped, usually private schools in India are making use of technology across the curriculum and to support school management.

Why technology is being used

A key focus in this school is enhancing the essential skill sets which it has identified are demanded in the 21st century – communication, collaboration, creativity, media literacy, global connectedness, critical thinking and problem solving. The school believes that the integration of ICT can play a significant role in developing these skills.

How it works

At this school, technology plays a vital role in academic and administrative functions and, it is argued, makes life easier for both students and teachers. The classrooms are equipped with technology aids including smart boards and the teachers have access to materials created for the Extramarks smart class system. The integration of

technology has significantly helped in providing access to curricular materials, which can also assess and monitor the learning levels of the students. It has also helped both the teachers and students to experience and, it is suggested, be more accepting of international culture and different views in the world.

Monica highlights that the school aims to strategically plan and support initiatives to become a 'future-ready school' by effectively implementing a policy of Bring Your Own Device (BYOD) and by developing appropriate pedagogical techniques for digital learning. The school provides a Massive Open Social Learning (MOSL) environment to help the students interact online in productive discussions and create shared projects to share experience and build ideas into knowledge. The school is also beginning to use

Google Apps for Education (GAPE) and other cloud-based technologies. The initiatives aim to make the teaching and learning process more efficient by also improving the flow of communication and information for all the people involved.

Kovleen uses ICT for the following activities:

- preparing digitised curriculum and lesson plans
- preparation of timetables
- generating results and report cards – these are then made available to parents online
- taking student attendance
- basic day-to-day teaching
- setting up holiday homework
- sending circulars to parents
- evaluation of topics through Google forms.

Challenges

Not all of this was easy to achieve even in a well-resourced school. The school needed to make a significant upgrade to their systems in order to install the Enterprise Resource Planning system, including their web server. Parents also needed to be encouraged to engage in the process through meetings and workshops. Tools that were brought in off the shelf had to be customised to suit the requirements and needs of the school. There was a lot of work integrating web links and online sites into the existing lesson plans and the project took considerable management to make it work. It was not just teachers and parents that needed support, the administrative team needed to be given extra help and training too.

Monica's comment

'The introduction of technology in the classroom has brought a plethora of positive impacts to educational instruction. The teacher has become more of a facilitator than just a dispenser of information. With the use of technology the students enjoy the topic taught, learn better, understand better and show better performance.'

Examples of digital resources used within the school:

1. Flipped teaching with the help of Smartclass Class Transformation System in sync with Extramarks, Mimio tools, Peoples Link and online collaboration with Khan Academy for maths, National Geographic for geography and Wordsworth for English.
2. Jaws software helps children with special needs by enabling them to access digital resources using audio-visual aids.
3. Teachers upload content through the cloud-based ecosystem and the Enterprise Resource



© Monica Joshi

Planning system, which can be accessed by students and parents for tasks such as homework and schedules. Parents can monitor academic performance through graphical presentation and progress reports.

4. Digitised lesson plans and curriculum mapping templates are provided to support teachers' planning and improve pedagogical practices.
5. Online collaboration with international schools to enhance global understanding and CISCO web links to learn foreign languages.

Kovleen's view

Kovleen Middha is a teacher of science at the school. She uses a range of different technologies to support the development of classroom learning. She says, 'I use webpages, research projects, videos, Microsoft Office tools and Google tools to enhance teaching of a concept, thus demonstrating that technology can be used to complement other aspects of good teaching rather than replace them. I try to work towards a student-centric pedagogy where technology is used effectively to create optimal learning experiences ... With ICT, I am able to create my own material and thus have more control over the material used in the classroom.'

To find out more

- <http://www.extramarks.com/smart-learn-classroom>
- <http://www.mimio.com/en-EM/Products/MimioStudio-Software.aspx>
- <https://www.khanacademy.org>
- <https://www.wordsworthlearning.com>
- http://nationalgeographic.org/education/?ar_a=1
- <https://www.google.com/edu/products/productivity-tools>

USING VIDEO CONFERENCING TO FOSTER GLOBAL CITIZENSHIP

HIMANI TYAGI

Teacher



Grade: 4–12

Subject: Citizenship and life skills

Location: Ghaziabad, Uttar Pradesh

School type: High-income private



© DLF Public School

Introduction

Himani Tyagi works in a secondary school in Ghaziabad, Uttar Pradesh in the north of India. At this school they run a Global Citizenship Club which regularly conducts video conferencing sessions with schools around the world. Their discussions of contemporary issues are relayed back to the school in regular classes or via assemblies.

How it works

Himani says, 'These video conferencing sessions are built into the children's weekly schedule. Teachers help students explore and identify opportunities available through Skype in the Classroom, Connecting Classrooms and the Tony Blair Face-to-Faith Foundation. They have story telling sessions, meet the author sessions, brainstorming and ideas sessions. They have had intense and productive discussions on contemporary world issues with countries like

Pakistan and Syria. They have had reflective sessions on topics like religion, spirituality and materialism. These sessions are scheduled and organised online and they happen virtually too.'

Why technology is being used

By taking part in these events the children in the school:

- have regular interaction with children from other parts of the world which helps to open their minds



- and exposes them to different ways of thinking and living
- learn to dialogue effectively
 - have achieved better communication and interpersonal skills through regular interaction with their global peers
 - learn to listen, ask good questions, collaborate and problem solve.

Challenges

In the beginning the students found it hard to engage in spontaneous dialogue, but as the sessions started to occur on a more regular basis and they grew more familiar with the process they began to engage more. Initially, they would usually just read out their ideas. However, with time they started to really listen to the different speakers. The types of responses they are able to give now demonstrate how much their communication skills have developed. Indeed, by having the sessions as often as possible, students really enjoy the conversations and are better at them.

What they have observed

Himani believes 'the children have become capable of communicating respectfully and assertively. They have become active listeners. They have also become spontaneous speakers. They are also more mindful of the feelings and emotions of others. This is visible in the quality of conversations in the classrooms.'

Duhita Parmar, another teacher from the school, states 'these lessons are invaluable, perhaps even more educative than the traditional curriculum-based teaching! Children are excited and totally engaged in the learning experience. If technical challenges are removed, then this kind of global education is a must for all children of all age groups.'

The way forward

Himani believes all teachers should try to 'incorporate these sessions into your children's weekly schedule. It could be a part of a club. Dedicate a team of teachers to identify quality opportunities for children to engage and connect with children in different parts of the world and choose a variety of topics.'

To find out more

- <https://education.microsoft.com/skype-in-the-classroom/overview>
- <https://schoolsonline.britishcouncil.org/about-schools-online/about-programmes/connecting-classrooms>
- <http://www.tonyblairfaithfoundation.org/projects/education>

OFFLINE MOODLE-BASED LEARNING MANAGEMENT SYSTEM

JYOTSNA AYYAGARI

Director, Prema Pravinya Society



Grade: 1–12

Subject: English, Science, Social Studies

Location: Hyderabad, Telangana

School type: Government



Introduction

The PRAVINYA Learning Management System (PLMS) has been introduced into schools in Telangana and Andhra Pradesh in the south of India. The PREMA PRAVINYA Society are based in Hyderabad, Telangana, and have introduced their LMS into 600 primary, secondary and residential schools across these two states, with 450 active users of their system. The system focuses on developing skills in science, social science and English, although other subjects are also covered.

Why technology is being used

Prior to developing the PLMS, PRAVINYA was working with 27 rural government schools. While evaluating the educational gaps and possible opportunities for improvement, they identified a number of issues to be addressed. For example, some schools had teachers who lacked content knowledge, and there was a general need for higher-quality teacher training to help meet the learning needs of children who came from a wide variety of backgrounds. The prescribed pedagogy had also changed rapidly and recurrently in a span of six years. In addition, post-school options for higher studies in Telugu medium are very limited and there was a recognised need for students to develop English language skills alongside regional languages.

PRAVINYA at the same time found that many schools

had a set of good computers with reasonable configurations, but these were underutilised.

Additionally, while a number of different organisations were creating suitable content in the Telugu medium, this could be made available more widely to benefit larger numbers of teachers and students. Finally, there was a clear divide between the digital learning opportunities available to rural students – particularly those in government schools – compared to urban students, especially private school attendees, a disparity that needed to be addressed.

How it works

The PRAVINYA Learning Management System provides multimedia lessons in the local language to rural government schools completely free of cost. They



© Jyotsna Ayyagari



© Jyotsna Ayyagari

have created a scalable model using an offline version of Moodle (an open source LMS) to which they have made minor amendments so that they can reach out to schools in remote locations without internet connectivity. They have aggregated content from multiple institutions and supported teachers to work with the materials.

In order to get the system into schools, PRAVINYA first approaches the district authorities who make initial contact with the schools. Interested schools are then contacted and are offered the system if their computer systems are working and capable of taking the software. Teachers are introduced to the system and given training in both the technology and the different methodology. Teachers are also encouraged to make contributions to the system, and new material is added each year. The team keeps in touch with the teachers over the phone, through messaging and through personal visits to the schools to address doubts and understand problems in usage and to address other issues and difficulty in using either the PLMS or the lessons provided. This support has been a major contributor to the improvement in usage patterns across the schools.

Measuring impact

PRAVINYA measure change and hence the outcomes against the core objectives, with continual monitoring and evaluation. They use both quantitative and qualitative indicators. To assess changes in teacher usage patterns and adapting to technology in the classroom, the project uses surveys, manual logs, machine logs and discussions. In order to assess learning outcomes, specially designed learning outcome assessments are conducted every two years across control group schools and project schools.

Challenges

PRAVINYA have faced a number of challenges, including:

- **technology-related:** power supply; hardware/software challenges; poorly maintained or out-dated systems; viruses. However, the team has found that once the PLMS is installed and some of the teachers and students become users, better maintenance becomes an established practice.
- **teacher/school challenges:** low digital literacy; resistance to integrating digital lessons into current teaching practice. The team conducts training activities and highlight the benefits of using the PLMS. The contact intensity and relationship-building with the teachers also helps in overcoming their resistance to learning and using the PLMS and other digital content. Eighth grade school children are also trained on the system to help provide an impetus to spread the system around the school.

PRAVINYA's comment

'Our innovation is a judicious combination of technology, delivery channels, training and relationship building and institutional collaborations [...] Our entire PLMS project is driven by outcomes. Our focus is not just on the reach and scale of our project but to a very large extent on the results that clearly demonstrate change. The major change in teacher behaviour that we notice is the transition from a resisting non-user to a resourceful user of technology to improve learning opportunities for students. The major change in students that we seek is improvement in concept-based learning and building confidence in using technology for learning.'

To find out more

- <https://moodle.org/>
- www.pravinya.net

RECORDING CLASSES TO IMPROVE TEACHING AND LEARNING

DEEPAK KUMAR CHOUDHARY
Teacher



Grade: 9–10
Subject: English
Location: Sasaram, Bihar
School type: Government



© Deepak Kumar Choudhary

Introduction

Deepak Kumar Choudhary teaches English in Rohtas district, Bihar, in east India. He uses a pen camera to record his lessons. This helps him and his learners to improve their skills.

Why technology is being used

Deepak says, 'There are many reasons for using my pen camera in my classroom.'

1. **To record my students:** I use my pen camera to record my students in terms of what they do, how they interact with each other, their mistakes, their pronunciation, their gestures, to find out who the passive learners are, measure their student talk time and so forth. These are just a sample of some of the areas I am trying to work on.
2. **To record myself:** it records my mistakes like my pronunciation, pace, my teacher talk time and whether my instructions were clear or not.
3. **To correct the mistakes of students:** using my laptop I try to correct the mistakes of students mentioned above and the videos can provide evidence for them to hear their own errors and identify them.

4. **To correct my mistakes:** this technology is very useful in correcting and improving my teaching. It highlights the mistakes I make while teaching. I try to make a conscious effort not to repeat them again in my next class.'

The process

Deepak explains 'The scheduled time in my school for any classes is 45 minutes. Usually students were in another class before I go to teach so I give them a five-minute break. This break helps me as well as students and it helps me to prepare the pen camera for the class. During the class, students do whatever I assign them.'

They do pair work, group work, mingle activities, checking and correcting, or they do a reading, writing, speaking or listening activity. While this is going on I simply monitor and record them. After the class, we



reflect on what we did and I ask for their comments and ideas. Then I give them homework and stop the recorder.

When the students come the next day, I show them the video on my laptop. It is very difficult to control the students at this time because they all are really curious to watch the videos and to see and hear themselves. My strategy here is to call them up in small groups to watch the video. I then explain their mistakes and often suggest ways for them to improve on the different skills. I also do whole-class activities when all the groups have finished watching the video as a way to help the students learn from their own mistakes.'

Deepak says

'I found the recorded videos are very useful to improve and correct my mistakes which I made while teaching. Consequently, I've started using very simple instructions and giving more opportunities for the students to speak. It has also helped me to understand how to manage and control the class better. Now students don't have a fear of being recorded. Actually, they now force me to show their recorded activities so that they can learn from their mistakes.'

Challenges

As Deepak explains, initially there were quite a few challenges to overcome. When the pen camera was first introduced to his classes the students did not believe that it was a recording device, so when they saw themselves for the first time in the videos they were stunned. This is when he ran into some problems, which could be split into two categories: affective and technical.

The affective challenges were:

- 'When the pen camera was switched on, the students' behaviour changed. They stopped responding and participating in a normal fashion.'



I began to realise they were afraid of being recorded. They were really worried about their mistakes being recorded.

- Some students initially stopped coming to school because they thought I would show their bad behaviour in class to the principal and their parents.
- There were some girls who did not want to be recorded.'

Technical challenges were:

- The quality of the video can be very variable, for instance when there is a lack of sunlight the videos are very dark.
- Sometimes, the class became so noisy that it was difficult to record clear audio from the students.

What he observed

Deepak says that recording his lessons has helped him a lot to improve his teaching practice, particularly in addressing some of the issues he has already mentioned, like recording the pace of his lessons or getting a better sense of whether he is trying to cover too much in class. He also thinks these recordings give him a better insight into what activities work or do not work and why and he is now better able to design lessons his learners are interested in and enjoy. He argues that since recording his lessons his learners' pronunciation has improved and he believes this is because for the first time they could really hear what they were saying. Overall he has noticed since using his pen camera that his students are generally participating more in class activities and are more confident speaking and reading in English.

What other teachers can do

Deepak says that 'this is a simple way of recording your own teaching and then reflecting on your practice. You do not have to use any specialist technology; this could easily be achieved using a smartphone too.'

LEARNING CENTRES

VIJAY RAINA

Trustee, IndiaEschool Trust



Grade: K–6

Subject: Maths, English, EVS, science

Location: Noida, National Capital Region

School type: Low-income school



© IndiaEschool

Introduction

Vijay Raina works for the IndiaEschool Trust which is based in Noida in the National Capital Region, and they provide services to low-income primary schools, focusing specifically on maths, English, EVS and science.

What they offer

The IndiaEschool Trust set up 'Learning Centres' for economically marginalised children to facilitate the teaching-learning process in 'low-income schools'. They also curate educational content from different sources and provide it to teachers and students. The objective is to help students access quality educational content using the internet. Despite government initiatives, poor children living in urban areas are badly served, as are children living in remote rural areas where there is a lack of infrastructure. There is also a clear focus on improving the capacity

of teachers so as to enable enriched classroom teaching. Thus, the Trust do not focus directly on children but on the capabilities and capacities of teachers and instructors who work either in government schools or as a part of the low-income school system.

Why technology is being used

The IndiaEschool Trust chose to focus on the usage of information and communication technology (ICT), online educational content and the power of the internet. Vijay explains that their belief is 'that with the



increasing availability and affordability of the internet, mobile connectivity and the problems related to actual teaching-learning delivery at the class room level can be solved to a greater extent by using ICT?

How it works

The Trust have kept the technology very simple, using the basic concept of cloud computing. They provide the materials using a browser (thin client), and provide local wireless to provide connectivity, a bigger display screen and audio speakers.

Vijay explains that they have:

- 'designed a simple-to-use platform (www.IndiaEschool.com) offering a guided browsing experience for teachers and learners
- mapped the curated content with the National Institute of Open Schooling curriculum and built user-friendly navigation on the basis of subject, class, theme (topic) and level (difficulty level)
- based on user feedback (from teachers), also built a 'library' facility including content in Indian regional languages.'

What they have observed

The IndiaEschool Trust have worked with the pilot learning centres and partnered with 'low-income' schools and what they have begun to see emerge is:

- 'increased attention and interest of students in the classroom
- better-prepared teachers
- better understanding of concepts
- improved students' grades.'

They are planning to follow this up later with impact studies to collect more evidenced-based data.

Challenges

As Vijay explains: 'It is generally the case that teachers working in low-income schools are not trained to use technology and may lack confidence to use ICT in their classroom. In addition, there is also less motivation to use ICT in low-income schools, as it is not seen as a priority. Coupled with this is internet connectivity which is still problematic in most regions of the country, particularly remote and rural areas.'

Other issues the IndiaEschool Trust faces are that online content needs to be continually curated and kept interesting for teachers and students. Budgetary and financial support is continuously required for the schools and students they work with and they generally find it difficult as a new organisation to raise the funds they need to keep going.

A teacher's perspective

Mamta Jha

'When I started teaching there was nothing like e-learning, there was only traditional teaching. Now we are using IndiaEschool and it is improving our teaching skills as well as learning skills. We can teach things through the IndiaEschool platform which we cannot teach through normal traditional methods. For example, we can show them actual mathematical concepts through videos.'

To find out more

- www.indiaeschool.com
- www.nios.ac.in

IMPROVING COMMUNICATION CHANNELS USING WHATSAPP

ANJULA SINGH

Principal



Grade: 1–12
Subject: English
Location: Kohima, Nagaland
School type: Government

Introduction

Last year the school Anjula works in introduced WhatsApp as they wanted to make the communication channels more effective between parents, teachers and students. As Anjula explains, 'we wanted to give regular feedback to the parents and management as well as address all the queries raised by parents and students.'

Why technology is being used

Anjula believes, 'the school has gained immensely by using WhatsApp. It has allowed us to post important information, reminders, pictures and even videos of school events and assemblies to the different WhatsApp groups in the blink of an eye.' Anjula highlights that communication is only effective when it is a two-way process. WhatsApp has enabled the school to widen their communication channels for parents and create a space where they too can share their ideas and ask questions.

How it works

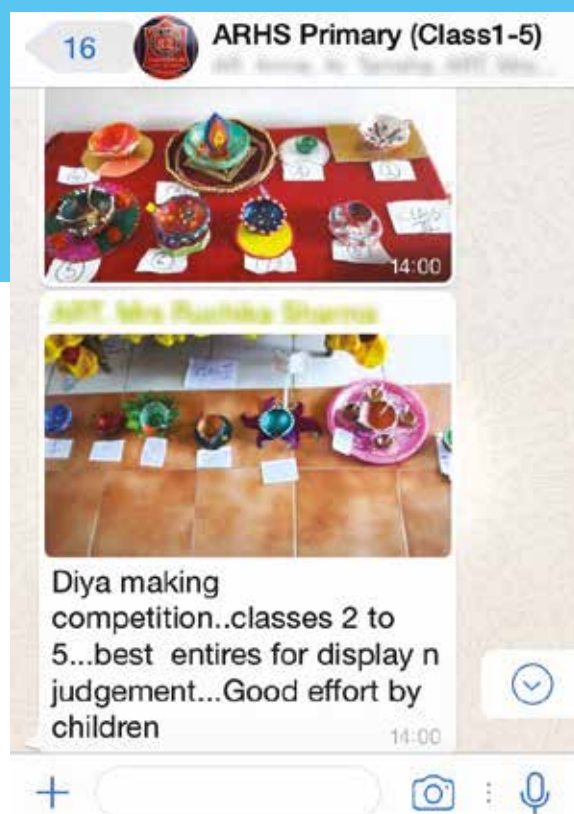
The school created three categories in which to set up their groups:

1. a group for each section: pre-school, primary and secondary
2. a group for each class
3. a group for teachers and non-teaching staff.

The class groups are the most popular. WhatsApp is used by the teachers, particularly in the primary classes, to let parents know what their child's daily homework is as well as to send motivational messages and videos. Teachers find they are able to have a better relationship with parents as they are easier to reach. Parents often send messages to the teachers expressing their appreciation of the work they are doing, which creates a positive environment for all.

Challenges

The school faced a number of issues initially. Their major challenge was that a few parents started forwarding general WhatsApp messages, photos



and videos and had to be repeatedly told that the groups were strictly for academic purposes. Another challenge was to ensure that parents did not name a specific teacher on a public platform if there was complaint. Instead they were requested to approach the teacher on a one-to-one basis. The third challenge was that parents sent queries to the school and teachers at inconvenient times, so they set up a rule where queries would only be answered during school hours. However, if the query was marked as urgent then parents were given a prompt reply.

Anjula says

'I would certainly recommend this type of technology use in other schools too. Parents can be given a page containing the school's WhatsApp number which can also include the necessary guidelines for it to be used effectively.'

USING THE INTERNET AS A TEACHING RESOURCE

DARWAN SINGH BHANDARI

Teacher



Grade: 7–11

Subject: Chemistry

Location: Satpuli, Uttarakhand

School type: Government

Introduction

Darwan works in Barkholu in Satpuli, Uttarakhand in the north of India where he teaches chemistry and social education using materials that he downloads from the internet.

Darwan says: 'I am using technology in two ways:
1. to teach my subject effectively in the classroom
2. for development of the personality of students through co-curricular activities.'

I create and download teaching-learning materials for my subject and use them in the classroom. I also show moral stories, science facts, documentaries of freedom fighters and important days of national importance to the students through the digital projector.'

Why technology is being used

Darwan explains, 'I believe that education is a very potent tool to bring about intellectual, social and economic transformation of our future citizens. Technology has a big role in imparting education effectively regardless of physical, economic and linguistic boundaries. Technology can enhance the quality of education and reduce its cost significantly. I want students to take a keen interest in their studies and develop as good human beings.'

The teaching process

Darwan downloads different kinds of materials from the internet, including PDF files, ready-made PowerPoints, YouTube videos, images, along with software like Crocodile Chemistry, which he uses to simulate experiments which would not be possible in the lab because of the lack of resources.

Challenges

Doing all of this has not been easy and the scarcity of IT resources was a big challenge at the start. The school initially had limited access to computer systems, but over time, working with funds from the



© Darwan Singh Bhandari

Parent Teachers Association (PTA) and with support from the American India Foundation, they built up the infrastructure. However, Darwan supplements the in-school systems by using his own personal laptop and digicam. Secondly, the students are from rural backgrounds, have little exposure to IT and are not very comfortable with the English language. Darwan started additional computer and spoken English classes in collaboration with other teachers. The students are slowly becoming comfortable with the IT tools. They can now create Word documents and PowerPoints, and can search for terminology in encyclopaedias and browse the internet.

Darwan says

'My students have started taking a keen interest in the classroom activities since I started using technology in the classroom. Learning outcomes have improved significantly. For the last three years my students have been successfully participating at the state level science fair with their models which are inspired by the use of technology and the internet.'

To find out more

- <http://crocodile-chemistry.software.informer.com/6.0/>

BRITISH COUNCIL INDIA: TEACHING AND TECHNOLOGY

The British Council supports thousands of teachers across India each year and our education programmes leverage technology in many different ways. We work with formal and non-formal education systems to improve English language teaching and learning and the development of core skills, also referred to as 21st-century skills, one of which is digital literacy.

Technology in the classroom

In addition to providing opportunities for learners to self-access online and mobile-based courses and resources, we work with teachers to introduce appropriate content in their classrooms to help learners develop their skills. These three examples illustrate the type of work that we do in this area.



The **English and Digital for Girls' Education (EDGE) programme** aims to improve the life prospects of adolescent girls in socio-economically marginalised communities. The girls use laptops loaded with British Council academic content and interactive software in sessions facilitated by peer group leaders or co-ordinators for up to five hours per week in after school community-based clubs. This programme is currently running in partnership with the Naandi Foundation and the Digital Empowerment Foundation.

British Council **myEnglish** courses develop adult learners' fluency, accuracy and confidence in English using a blended model. Learners follow a guided nine-week online programme, performing a range of tasks, interacting with each other and receiving personalised support and feedback from an experienced British Council e-moderator. At the end of each week learners participate in a synchronous and online one-hour class. At the start, middle and end of the course they attend a three-hour face-to-face class to consolidate learning.

The British Council works with teachers to integrate the use of our **LearnEnglish Schools DVD** into the

daily learning of their students, giving them access to a range of games, songs, stories and videos that help children learn English in a fun and interactive way.

Technology for professional development

In 2015 the British Council published a research report on *Technology for professional development*, exploring teachers' preferences in South Asia. Through our project work, we use technology in a variety of ways to develop communities of practice and share information and resources.

On the British Council's '**Teach English in India**' **Facebook page**, teachers can access, discuss and participate in a wide range of CPD opportunities. These include viewing regular 'Facebook Live' videos recorded by the British Council's academic team, discussing ideas for classroom activities, challenges and solutions with peers and exploring other online resources.

TEJAS is a partnership project between the Government of Maharashtra, Tata Trusts and British Council India. Teachers form face-to-face and WhatsApp-based communities of practice in their local areas, with each group supported by a coordinator. This helps them to develop their language ability, teaching and reflective skills.

British Council India **teacher development films** enable teachers to see how learner-centred approaches can be with real students, following the state curriculum. These films are distributed to teachers via several digital channels including micro-SD cards, DVDs, USB drives, email, YouTube and social media. So far, four sets of films have been produced in partnership with the state governments of West Bengal, Maharashtra, Bihar and Tamil Nadu.

To find out more:

- www.britishcouncil.in/englishpartnerships
- www.britishcouncil.in/myenglish
- www.facebook.com/TeachEnglishInIndia

CENTRAL SQUARE FOUNDATION: TEACHING AND TECHNOLOGY

Central Square Foundation has supported over ten organisations including Khan Academy, Language and Learning Foundation, Teach for India, Million Sparks Foundation, The Teacher App and Nalanda Project, which use technology for student learning or teacher education. CSF has also advised multiple state governments on their approach to technology in education.

Technology for student learning

Indian low-income schools typically have large class sizes, inadequate teachers and many first-generation learners. Multi-grade teaching is commonplace, with students across a variety of learning levels studying in the same class. There is limited access to technology in low-income schools with negligible internet penetration, both in rural and urban areas, but access to personal mobile devices within families is rapidly growing. In this context, CSF seeks to provide access to personalised learning for all students, alongside their regular classroom instruction so that they learn at their level and at their own pace. To implement this, it is necessary to train teachers to use student achievement data to deliver personalised instruction and provide modules on blended learning pedagogies as part of the teacher training programmes (pre-service and in-service). CSF partners have built tools which work on tablets and offline. CSF has supported them with funding, strategy, measuring for effectiveness and driving large scale adoption.

One of CSF's flagship grants in this space is **The Nalanda Project**, which is an in-classroom blended learning program that uses an offline version of Khan Academy (KA Lite) and Mangogenie on tablets. This is their third year and the programme has been implemented in over 170 classrooms in Mumbai, Pune and Delhi. CSF has also supported an after-school learning centre implementation of a research-based adaptive CAL program for reading and mathematics called Mindspark. A randomised evaluation of this program conducted by Abdul Latif Jameel Poverty Action Lab (J-PAL), showed a two to four times increase in learning outcomes compared to the control group. We are now exploring opportunities to scale Mindspark in government schools.

In addition, CSF has also been advocating with governments to rethink their policies and align ICT usage to enable personalised learning for all students. Government funded computer labs in schools could provide students with access to individualised learning time. Some states like Andhra Pradesh and Chhattisgarh are now looking to better spend their ICT budgets to provide 1:1 access to technology for

students in school. The Government of Rajasthan has also signed an MoU to pilot Khan Academy for Math remediation in 12 schools.

Technology for teacher education

India has over 10 million educators who require continuous professional development to be effective in classrooms and schools. However, they receive irrelevant training sessions which are planned in an adhoc manner, and do not provide the necessary knowledge or skills. There are several opportunities for mitigating the gaps in teacher education at scale using technology. CSF has supported several partners to build technology platforms which provide teachers with short courses for professional development or curriculum-aligned lesson-planning resources which improve their classroom transaction. CSF has also built a teacher observation application to support school leaders and academic personnel in coaching teachers.

Language and Learning Foundation (LLF)

has implemented its eight-month blended course on early literacy with over 95 teacher educators in five states of India. The blended course comprises of topic-wise modules, quizzes, assignments delivered virtually and two to four face-to-face sessions over the entire period. Over 80 per cent of the first cohort was actively engaged on calls and submitted all assignments and projects on the Moodle platform. LLF will work with 200 participants in its next cohort.

The Teacher App aims to empower teachers to own their professional learning using a mobile app solution which hosts modularised, competency-linked courses. A central content team works with subject matter experts to develop courses which are focused on subject pedagogy, practice-oriented and designed for a mobile app experience. There can be multiple implementation models including in schools, teacher training organisations and direct to teachers.

To find out more:

www.centralsquarefoundation.org

Glossary

App (Application) — This is a piece of software often with quite limited capabilities that can be found on various phones or other portable devices. They are often free, or very cheap, but can also work on a model of ‘in app’ purchases where you can buy add-ons to the original software. They were originally associated with smartphones and tablets, but the term is now used to refer to software in general.

Analytics — This concept is linked to growth of data available in the world that is increasingly used to measure academic performance. As we increasingly interact with technology and that technology records what we do and can measure the amount of time someone interacts with material, how they progress through it, how well they do in a test or activities, then an analysis of this data can give information on how well a person is doing. This information is increasingly displayed on ‘dashboards’ that give a graphical representation of someone’s activity or performance.

Augmented reality (AR) — When a mobile phone with the right app installed is pointed at an object like a picture, that has a trigger connected to it, additional material will be loaded on to the mobile device. So you may have a picture on the wall of the classroom of various famous tourist sites around the world. Pointing the mobile phone at the picture will bring up additional information.

Bring your own device/technology (BYOD/T) — This is a growing and developing practice where learners are encouraged to use their own mobile technologies in or outside of the classroom. It is predicated on the idea that many learners have smartphones, tablets and laptops and the school or college provides connectivity via Wi-Fi.

Community of practice (CoP) — A term that is used to describe a group of people who work together as a learning community. Term originally coined by Etienne Wenger.

e-Portfolio — A piece of software that allows the storage of different types of learning materials that can then be shared. Allows learners to record their learning journey, reflect on progress and for teachers and potentially parents and employers to see how a learner has progressed.

Flipped classroom — A term in current use to describe the previewing of (mostly) video material before a class, so that time in classroom can focus on discussion or activity rather than being given content by the teacher.

Gamification — This is where elements of digital games are applied to the classroom, so in a digital game you have to score a certain number of points before you can progress to the next level, but you can work through the level as many times as you like. Their use is often seen as quite behaviouristic and digital game designers argue that gamification is not the core of what gaming is about.

Google Drive, Google webpages and Google classroom — A collection of useful tools provided by Google in which you can create different kinds of documents which are stored online (in the cloud). Documents are of various types, but they are built so that it is easy to share documents and work collaboratively. Google webpages allow you to quickly create webpages and Google classroom provides a way of linking up all the other tools into groups, monitoring

progress, etc. Google classroom needs to be set up at an institutional level.

Infographics — A way of summarising and presenting data using easy-to-read charts and small pictures. These days associated with specific pieces of software that support the development of the infographics.

Interactive whiteboard (IWB) — An electronic whiteboard that is touch-sensitive and is used in combination with a projector to show various kinds of material in the classroom that can be interacted with using the touch-sensitive surface. Most IWBs come with specialised software that enable teachers to create their own materials. They have linked speakers. Many publishers have produced digital versions of their textbooks that include different kinds of activities that make use of the IWBs features.

Learning Management System (LMS) — These are sometimes called virtual learning environments (VLEs) and are essentially a collection of tools, like forums, assessment tools or content display tools, that enable teachers or publishers to collect a number of materials in one place. They can be monitored to check on access.

Massive Open Online Course (MOOC) — These are (mostly) freely available courses produced by universities across a range of subjects. They usually consist of a combination of video materials with associated discussion forums and some form of testing, usually in the form of multiple choice questions. Courses are usually taken by large numbers of people at the same time, so they are essentially self-study.

Podcasts — These can be audio or video. They are essentially a recording of a talk, discussion, lecture, a demonstration of a process or a story. Audio podcasts are easy to distribute on a variety of mobile technologies including MP3 players and phones. Video podcasts are often streamed, but can also be made available offline either by downloading them when there is access to the internet or on SD cards.

QR (Quick Response) codes — These are like a bar code and allow a quick link to some ready-made materials. They are added to coursebooks to extend the content. They are being replaced by augmented reality triggers.

Social networking tools — There are many of these, including Facebook, WhatsApp and WeChat. These allow the creation of communities who can exchange ideas on a variety of topics. They have essentially replaced earlier tools like discussion forums. A tool like WhatsApp has the advantage over a public tool like Facebook that it is a closed community.

Video conferencing tools — A range of different tools exist, including basic ones like Skype or more sophisticated online classroom tools like Adobe Connect.

Virtual reality (VR) — A 2D or 3D online environment where you can engage in activity that you would do in the real world, like visit a museum, or something it would be impossible to do, for example to go inside a volcano, and get an idea of what these environments are like. Virtual reality tools are used also for training people in skills like surgery or building construction.

Wiki — A webpage environment that anyone who is given access to it can edit the pages.

Acknowledgements

Central Square Foundation and the British Council would like to thank the following individuals for their work on this publication: Hasneet Kaur, Nishit Jain, Namita Dalmia, Hari Hallan, Shally Makin, Jemima Hughes, Rustom Mody and Amy Lightfoot.

Dr Gary Motteram and the teams at Central Square Foundation and British Council India would like to thank all 438 contributors who submitted case studies for consideration. Choosing just 22 to publish was a big challenge. Our goal was to select as representative a sample as possible, while at the same time ensuring the availability of photos and the level of detail required to tell each story. We are very grateful to all those listed below, who took the time to answer our call for proposals.

A.Anju; A.Elizabeth; A.J.Mahansuba; Acme Mittal; Adam Khorakiwala; Adhi Selvam; Aditya P Tripathi; Ahlada Janani Sudersan; Akhilash Kumar Srivastava; Alpana Nagar; Alpesh Dadhaniya; Amar Nain; Amit Baluni; Amita Suri; Amrita Kapur Suri; Amruth B R; Anand; Anant Kumar Joshi; Anik Kundu; Anil Mammen; Anil Petkar; Anita Sreejit; Anju Chauhan; Anju Madan; Anjula Singh; Ankit; Ankit Gupta; Annie Besant; Anoop Singh Negi; Anshu Jamnal; Anthony Kavitha; Antoinette Viegas; Anuj; Anupam Kaushik; Anupama; Anuradha Rai; Aparna Das; Archana Pande; Archana Sharma; Arunmozhi; Ashok Patil; Asiya Fehmida Malik; Atul Doshi; Avaan Vakharia; Avan Antia; Avnita Bir; B. Padma; Babulal Danga; Balaji Baburao Jadhav; Bansari Suryawanshi; Bhagwati Papnai; Bharathy Shree; Bhawna Joshi; Bhawna Verma; Bhriгу Nathram Sharma; Bhupinder Gogia; Bijal Damani; Bindu Arya; Biswajit Sinha; Blanca Dean; C.Saraswathy; C.Vanathi; Carol Preethi D'souza; Champa Ram; Chandra Mohan Singh Rawat; Chandreshbhai Sadrani; Chandrika S Bhandary; Charu Dogra Rawat; Chetna Sabharwal; Chhamandeep Kaur; Chhavi Kumar; D.Ushabanu; Dakshinamoorthy V; Daniela Gheorghe; Darwan Singh Bhandari; David Penumaka; Deendayal Mangal; Deep Jyoti Sonu Brahma; Deepak Kumar Choudhary; Deepak Pathania; Deepali Dilip Babhulkar; Deepankar Kumar Dubey; Deepika Gupta; Deepti Gusain; Deepti Mathur; Dharendra Singh Tomar; Diane D'souza; Dinesh Prakash Sharma; Divya Gulati; Divya Kapoor; Dr. Bhavika K. Vyas; Dr. Mona Mathur; Dr. Rajiv S Kochhar; Dr. S. Rajagopalan; Dr. Suresh Reddy; Dr. I.Vijaya Babu; Dr. Revathy Parameswaran; Dr. Shanmukh.S; Duhita Parmar; E. 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Manjusha Shamrao Sagrolkar; Sneha; Sonali Sinha; Sonu Kalra; Stephen Philip; Suchi Dakoria; Sudhir; Sumanlata Gupta; Sumayya Firdos; Sumedha Sodhi; Sunil Kumar Gulpariya; Sunila Bhatnagar; Surabhi Mahota.; Suraj Meiyur; Surendra Singh; Surinder Kaur; Sushma Sharma; Swapna Yadav; Swarnalatha; Swaroopa Mallavarapu; Swathi Balakrishnan; Swetha Guhan; Sylvester; T.Ravikumar; Tamizh Ponni Vp; Tanvi Metre; Taruna Mongia; Tshering D Bhutia; Tukumoni Mahanta; U.D.Srividhya; Ullas Ponnadi; Uma Devi; Uma Srinivasan; Umamageswari.S; Urvashi Singhal; Usha Chaudhary; Usha Malhan; V.Bhuvaneshwari; V.Clara; V.Kavitha; Vaishali Shah; Val; Vandana Dua; Vanishree K; Vasumathi; Venkat Ramasamy; Venkataramanan Sriraman; Vidhya Rani; Vidit Ghai; Vijay Raina; Vijayalakshmi.K; Vimal Raj; Vimala Devi; Vinay Kumar Shah; Vinod Kumar Bansal; Vishal Bhatia; Vishalpur Pravinpur Gauswami; Vivek Kumar; Vyshnavi; Wilson Thomas; Yachana Villaitrani; Yashita Pardeshi; Yogendra Kumar Katara; Yogesh Desai; Zohra Lawrence.

Jointly published by British Council India and Central Square Foundation, this collection of case studies illustrates teachers and organisations using technology in innovative ways in classrooms across India. The case studies show a wide range of hardware and software being used to improve learning for students and for teachers' professional development. By highlighting this good practice, we aim to inspire future action by others to experiment with these innovations in similar contexts.

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