

# AN EFFECTIVE MODEL FOR LARGE SCALE IMPLEMENTATION IN THE FIELD OF EDUCATION

Yadav, Prem  
Pratham InfoTech Foundation  
[www.pif.org.in](http://www.pif.org.in)  
Mumbai- 400024, India

Billava, Roopa  
Pratham InfoTech Foundation  
[www.pif.org.in](http://www.pif.org.in)  
Mumbai- 400024, India

Bora, Loni  
Pratham InfoTech Foundation  
[www.pif.org.in](http://www.pif.org.in)  
Mumbai- 400024, India

Ngaihte, SK  
Pratham InfoTech Foundation  
[www.pif.org.in](http://www.pif.org.in)  
Mumbai- 400024, India

## ABSTRACT

India has several legislative mechanisms at the Central and State level to boost digitalization in multiple areas. Education is one area where the national government wants to improve the education system and have adopted ICT as a program in schools. However, ground realities are different and have a lot of area of improvement in achieving the SDG 4. The Sustainable Development targets for 2030 calls for ensuring the completion of primary and secondary education by all, and guaranteeing equal access to opportunities for access to quality technical and vocational education for everyone. There are various approaches that supplement the process of achieving SDG 4 - Quality Education. PIF feels grassroots community level mobilization and school-based initiatives are key factors. The driving principle behind Computer Assisted Learning program in schools is to provide an exposure of Computer based teaching and learning. The use of

computers in the education to improve the fundamental skills as it captivates the students' interests in learning. The usage of PIF's own developed educational software helps the students to learn at right level. PIF aims to build foundational skills in literacy and numeracy for children before exiting primary school.

## Keywords:

Information Technology, Computer Assisted Learning, Information Poverty, Digital Divide, Quality Education

## INTRODUCTION

Pratham InfoTech Foundation (PIF) is a non-profit organization established in 2004 that works in India to bridge the digital divide, facilitate the adoption of information technologies (IT) in education, and equip disadvantaged youths with skills, tools and capabilities that new global economy demands. It is committed to ensure “e-education for all” and is engaged through various programs in schools and communities.

A quality education is one of the foundations of sustainable development. It enables self-reliance, boosts the economic growth by enhancing skills, and improves people’s lives by opening up opportunities for better livelihoods. The mission to improve the quality of education in India and to ensure that all children not only attend but also thrive in school is being accomplished by working in collaboration with the government, local communities, parents, teachers, volunteers, and civil society members. PIF have been working with multiple stakeholders to minimize the ‘Information Poverty’ in India. PIF’s CAL program aims to supplement rather than replace governmental efforts. The programs are implemented on a large scale to not only reach as many children as possible, but also to create an adoptable demonstration model for state governments.

PIF also abide by one of the Sustainable Development Goals known as ‘SDG4 - Quality Education’ as it is significantly relevant to achieve the goals of the organization. The Sustainable Development targets for 2030 calls for ensuring the completion of primary and secondary education by all, and guaranteeing equal access to opportunities for access to quality technical and vocational education for everyone. It enables self-reliance, boosts the economic growth by enhancing skills, and improves people’s lives by opening up opportunities for better livelihoods. Providing qualified teachers and to provide teacher training for enhancement of their skills and knowledge are as well a target of SDG4.

## Rationale

Our field research has also shown that even though some Government schools have introduced schemes to provide access to computers within the premises, the key training of personnel is often missing. Technology-rich schools generate impressive results for students. These include enhanced achievement for all major subject areas, higher test scores, improved student attitude toward learning, increased motivation to learn, increased self-confidence and self-esteem when using computer-based instruction and subsequently improved student attendance and retention. The process of learning in the classroom also becomes significantly richer as students have access to various types of information and learn in a computer. Pratham’s own experience with running the CAL program, along with research conducted by MIT reinforces these positive outcomes of IT on learning levels. There is a keen interest and strong demand from parents and schools for the provision of IT learning for students. Even in economically disadvantaged communities, stakeholders are looking to equip children with skill sets in education to enhance their ability to compete in the job market and enhance their future employability. The provision of a cost-effective, adaptable, value-for-money solution works at filling this crucial gap in the digital divide.

## CAL Program Objectives

- To Bridge the Digital Divide and facilitate children to experience and use IT.
- To bring positive Impact on the students’ Learning Levels through computer technology in Math and Language
- To enrich teaching / learning levels and interest of children in schools through the use of child friendly, interactive and curriculum oriented educational software
- To Adopt Information technology in education

- To Enhance the Teachers' Skill Sets and familiarity with IT

## COMPUTER ASSISTED LEARNING

The Computer Assisted Learning (CAL) Program has designed as a pedagogy/ technique that entail the usage of information technologies within a traditional classroom environment. This collaboration of traditional method of learning with educational software is known as hybrid blended model. The educational games and interactive training tutorials are some of the best components of computer assisted learning program. But this model doesn't intend to replace the traditional method of teaching but rather to supplement it with the growing demands of quality education. The program works as a combination of 3 factors.

1. High quality hardware that makes the children comfortable with,
2. Educational software developed by Pratham in various Indian languages aptly designed around the school curriculum,
3. Library corner that has numerous educative books in local language, a craft /activity corner that enables the children to learn their academics through the projects and crafts they prepare.

Efficient computer instructors called Sancharak, energetic youths residing from the same community, assists the children in enhancing their day-to-day learning and skills. On the whole, CAL works towards bridging the digital divide along with improving learning in schools, generating interest in students, increasing enrollment, attendance and reducing the dropout rate in schools.

The use of computers in the education improves the fundamental skills as it captivates the students' interests in learning. The usage of PIF's own developed educational software helps the students to learn at right level. PIF aims to build foundational skills in literacy and numeracy for children before exiting primary school. As per

ASER 2018 it shows that only 44.2% of students from Government schools across India can read class 2 level text. However, the wide gap of student learning capacity according to their expected standard level can be achieved by Teaching at the right level (TaRL) approach initiated by Pratham Education Foundation. Teaching at the right level (TaRL) is an evidence-backed educational approach that helps children develop basic reading and mathematics skills, opening doors to a brighter future. At the instructional level, the approach works by assessing children's learning levels using a simple tool; grouping children based on learning levels rather than age or grade; using a range of engaging teaching and learning activities; and focusing on foundational skills rather than solely on the curriculum; and tracking children's progress.

Execution of the CAL Program is always locally pertinent and contextually relevant. The preliminary stage involves careful selection of partner schools, recruitment/training of sancharak / teachers, community mobilization, curriculum finalization, development of teaching-learning aids and base line assessment. Classes are kept small to ensure individual attention and optimal learning. PIF's intervention has shown comprehensively that the use of IT in early learning has a positive impact on children's concentration, application, engagement, motivation and attainment. Much hope is being placed on the potential of Computer Assisted Learning (CAL) to dramatically improve the performance of primary education in developing countries. MIT (Massachusetts Institute of Technology, USA) in partnership with Pratham conducted a research on CAL program in Gujarat. The research was led by Noble Laureate Dr. Abhijit Banerjee and Dr. Esther Duflo, Professor of MIT in Economics, titled "Remedying Education: Evidence from Two Randomized Experiments in India." The study concluded that Math scores of children who participated in the Pratham CAL program improved by a 0.47 deviation. In addition, setting up of CAL centers also positively impacts the attendance and interest in schooling of students and their parents.

To ensure the desired goals and outcomes are being achieved, Evaluation and Monitoring is done at regular intervals and overseen by the PIF-CAL Executive Team. Assessment is also conducted to evaluate and to measure the knowledge gained by the students in any program. It also reflects the impact of the program.

Students are evaluated by written and practical process in CAL and DLLS program. The Written Process involves objective and subjective types of questionnaires. The Practical test involves designing of the projects using different software's. Approximately 3900 question banks based on the course curriculum has been uploaded on the Evaluation portal. These questions are based on the grade wise, pre-defined competencies to be measured. With the help of this portal, grade-wise and medium-wise question papers are auto-generated.

The students are selected through Systematic Random Sampling Method. In systematic Random sampling, it can have a random starting point from the population, and then a sample is taken with continuous fixed intervals of the population depending on its size. The sampling is taken with a fix interval of 4 or 5 between the selected numbers to the next selected number. In a fixed interval of 4, if roll no. 1 is selected then it will be followed by 5, 10, 15, 20, and so on. In a fixed interval of 5, if roll no. 1 is selected then it will be followed by 6, 11, 16, 21, and so on. 10-20% students are randomly selected for the baseline assessment. Once the students are verified of 20% for written assessment, they are seated altogether within a length of an arm distance. For the practical assessment the students are seated singularly; one computer per student in the lab so that the students can perform at their own.

Before conducting the assessment, one day orientation session is held for the responsible person. The Team leaders / Program Coordinators are assigned to lead the student assessment and the sancharaks assist the team leaders. For better transparency the team leaders are shuffled and are assigned different schools for conducting the assessment. The responsible

person has to give clear instructions to the students on how to participate in the assessment. They are responsible to make the student calm and confidence before starting the assessment. While conducting the assessment they assist the student in writing their names, explanation of question as per the need. Their prime role is to observe and monitor the assessment. Any member of the team who leads the assessment and supervision of a particular center will be responsible for correcting the papers of that center and data entry. The coordinators will have to do the 2<sup>nd</sup> round of correction for cross validation of raw data and to ensure that the Team Leaders are updating the data as per schedule. The final round of checking is done by the data executive team from the central office. This is done to ensure that the data uploaded in the system is accurate. However, in places where the Sancharak will be leading the 80% of student assessment, she/he will be responsible to give instruction and do the paper checking and data entry

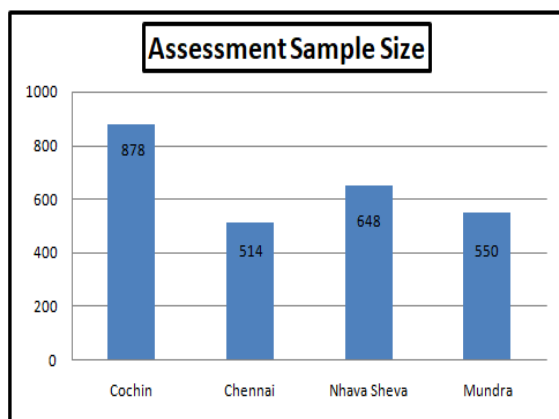
The Semester 1 baseline assessment was conducted in the month June where as the endline assessment was conducted in the month of November across all 4 locations. The comparison report of baseline and endline for semester 1 is shared seperately in a presentation.

The CAL program aims to spread the significance of computers in learning through the methods to enhance the learning capabilities among the children according to their age. PIF approach has always been holistic and program management oriented. PIF experiences have made a mindful of the different facets that influence a child's learning and also the multiple variables that contribute to the overall success and sustainability of the computer centers run in the schools. Thus, the execution of the CAL program is always locally pertinent and contextually relevant, taking into consideration the innumerable criterion.

## PROGRAM IMPACT ASSESSMENT

Impact assessment study was conducted in the year 2019 to evaluate the program and the learning sustainability of students. The impact study was conducted in 4 locations, i.e. Nhava Sheva, Mundra Chennai and Cochin. The students were assessed on the foundation skills that have been taught in the program for two years to check the learning sustainability of students.

The universe of the study targeted five schools

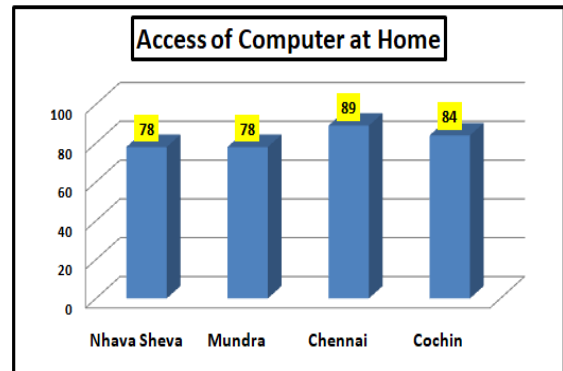


from each of the locations and 5 students from each grade were randomly selected for assessment. The assessment was conducted on students to know the levels of the students' learning based on their theoretical and practical knowledge and skills. Focus group discussion and Interviews were conducted with the beneficiaries of the program. Besides the tests, an interview schedule for the students is also prepared for better documentations of their interests, consistency towards the classes and other skills that have acquired through the program.

### FINDINGS OF THE STUDY

The beneficiaries and stakeholders have well appreciated the program as it is shown in the following graphs.

The "x" axis represents the measured competencies and "y" axis represents the percentage margin of students in the assessment. Each Data shown in the graph is of Percentage.



The majority of the respondents do not have a computer at home, as they are from a poor socio- economic background and it can be stated that only because of Pratham InfoTech Foundation's Computer classes the respondents have access to computers. Hence, it can be stated that this program is very much useful for the poor students studying in Government Schools / Government aided schools.

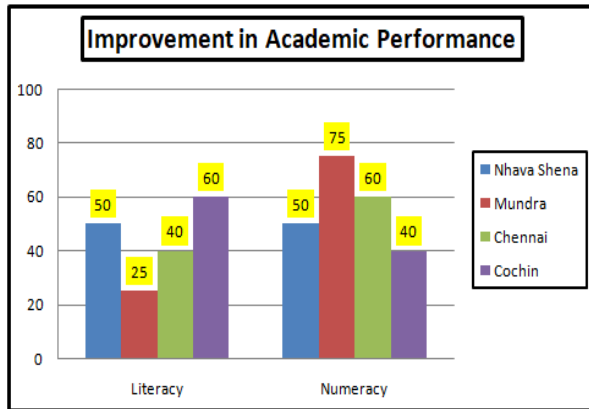
CAL Program had helped the students in improving the performance in subjects like literacy and numeracy. All the respondents have shared a common observation about the improvement in Academic Performance in the students.

### TESTIMONIALS OF STAKEHOLDERS

"Being a government school, students and parents feel that they are not a par with the facilities offered by private schools. But with this computer program, things have changed. Our students are learning much more and benefitting a lot. Earlier they did not even know how to spell 'computer'. Now they know almost everything about operating it and learning from it". **Vandana Thakur- Science Teacher- Govt. Middle School, Sankheda, Hoshangabad**

"I have seen changes in my son. He wants to study. He enjoys school. Each day he shares about what he has learnt in his computer class. As a father, I am very happy for him. I know that one day he will be successful and our conditions at home will improve." **Leeladhar Gour- Father- Sankheda**

"When we look back at the CAL Program, we find that the impact is actually visible when you



start looking beyond the numbers. Students are now eager to go back to school! In a way, that's where the entire transformation process has begun. People are in a way keen to go back to school and get the basic education and alongside learn the skills that will help them get ready to take on the world ahead". **Ashish Singh – Executive Vice President- IDFC Foundation**

“For us, PIF has been a very valuable partner, technically capable in delivering projects and making an impact at the grassroot level. This is not something that every organization can do. With this, we would be able to move in the direction of a better world, where dignity is not a privilege” **Arun Nathan- Program Director- IDFC Foundation**

“We were struggling with absenteeism. Our students used to leave their house in the morning but not come to school. After the Computer Program started in our school, this issue has been tackled well. Moreover, on the day of the computer period, students attend school in full strength”. **Kailash Sarode – Principal- Vikhroli Parksite Municipal English upper Primary School.**

## CONCLUSION

Digital technology is increasingly intertwined with everyday life from schooling and education, to political engagement and even financial and health management. Developments in digital technology, and the pace at which they emerge, drive innovation in our lives in different and often profound ways.

While there are numerous opportunities and aspirations associated with digitalization, there is also a crucial need to understand and mitigate the challenges it presents to society.

Digital India is a concept to prepare India for a knowledge future. Digital India won't be possible when the foundational skills and knowledge of digital IT to the masses including school going children of our country is not emphasized through proper training. Children are the foundation and pillars of a country. Aspiring children can be imbedded with basic fundamental skills of numeracy and literacy which can be developed from educational software's and activities apart from the curriculum of academics framework. The digital world is increasingly penetrating the education and skills domain, with technology gradually being used to deliver education, knowledge and skills in new and innovative ways. This penetration is coupled with future changes to the mode and pattern of work. Given the increased use of fast changing digital technologies in the workplace, new skills needs have emerged. The use of these technologies has contributed to transforming learning and skills development into a lifelong process.

Years of experiences in the field of e-education, PIF have learned that the poor working conditions of many teachers in India do not contribute to the expected learning achievements. Therefore, CAL Program was designed cautiously for low cost and its sustainability. The intent of the program is to support the government in utilizing the existing resources. It aims to motivate the government teachers to understand the importance of digital education and the adoption of information technology as a mainstream medium of learning. A platform has been created for reliable and context – sensitive digital education to promote equal opportunities to inspiring young students. To improve the quality of education in India and to ensure that all children are inspiring to thrive in school is being accomplished by working in collaboration with the government, local communities, parents, teachers, volunteers, and civil society members. PIF programs aim to supplement rather than

replace governmental efforts. They are implemented on a large scale to not only reach as many children as possible, but also to create an adoptable demonstration model for state governments. PIF's Model of Approach minimizes the inequalities by ensuring that every child should have the accessibility to quality education through Information Technology based models. The CAL program helps to reach out to all the children from disadvantaged backgrounds, where there is limited opportunity, experiences and exposure of Information Technology based education in schools.

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