

A REPORT ON

THE FASCINATING LABS:

Learning by doing' multi skilling facilities in
lower-secondary schools, ensuring improved
enrolment & accelerated learning



THE FASCINATING LABS

UNICEF, in partnership with the Vigyan Ashram and STARS Forum established IBT (Introduction-to-Basic-Technologies) laboratories for children in the 11-14 years age group in government schools. These labs integrated academic learning with multiple pre-vocational themes and skills.

The intervention, ongoing in 60 schools in 15 clusters of as many cities of Uttar Pradesh, focuses on flexible learning opportunities for out of school children, children engaged in income generation activities and children at high risk of dropping out of the education system. It also concentrates on accelerated learning for all children, including those enrolled in the schools.

Considering the success of the intervention, government of Uttar Pradesh has decided to upscale the intervention to more than 2500 lower secondary schools in the coming academic year.

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Khushi from Gorakhpur, is 13 years of age and an eager school student. She loves going to school and interacting with other children. She is also making sincere attempts to understand and learn what is being taught in her class.

However, less than a year ago, her situation was quite different. Her mother felt that she could be a good help at home and little Khushi was thus required to stay at home.

Things changed with the IBT (Introduction to basic Technology) intervention. Her family was motivated by the IBT instructor, Ms. Reema Verma, to send her to the IBT lab. In the IBT lab on Home and Health, Khushi learnt of a lot of things including how to measure blood pressure and how to bake a cake.

Thanks to the new learning, the perspectives at home changed. Gradually, her parents started taking interest in her school and studies and Khushi was enrolled in school. She is now a happy school student in Mirzapur, Gorakhpur.



Khushi, with her friend, showcasing an edible they have made at the Home and Health IBT lab

Such stories of change abound.

Salahuddin from Saharanpur is another such child. He gradually got inducted to schooling, thanks to the IBT intervention. This started with first, an interest in the

lab, then in the school, till finally he started coming to school fairly regularly.

However, the transition is not easy and there is a tendency to slide back into absenteeism whenever there is a school holiday or a break in school routine for some reason or the other. Regular follow up, coupled with the appeal of IBT classes, can take such children miles.

What is heartening is also how this intervention has attracted the **regular, school going children**. Owing to their desire to participate in this 'learning by doing' method, the school head masters and teachers have encouraged the participation of these children too in the IBT labs. As a consequence, these children are showing greater delight in their studies and learning at a deeper level as well as retaining the new found knowledge better.



Jiten Patel, Class VIII, UPS, Chinhath Lucknow, is a regular school goer and a happy learner at the IBT lab. He mentioned that the lab learning helps him with gaining new knowledge, revision of finished topics and better retention of what he learns

Thus, the IBT intervention of UNICEF, Uttar Pradesh, (run in partnership with Vigyan Ashram and Stars Forum and with tacit support of Samagra Shiksha Abhiyan), is bringing OoSCs into the fold of education. It is also accelerating the learning of the currently school going children.

1. THE CONTEXT

The covid induced study break affected the learning continuity of children, more so that of under privileged children, with lower access to alternatives such as online learning. This, and the economic difficulties created during Covid-19, pushed a section of the children who had been pulled into the education net, back to their previous situations.

A rapid survey by Campaign against Child labor, a group of 24 non-governmental organizations, was conducted among 818 children in different parts of India. The objective of the survey was to understand the impact of Covid-19 on child labor. The findings from the survey revealed that child labor increased by 280 percent among vulnerable communities. In such a critical downslide, innovative efforts became of essence.

Fortunately, UNICEF and the government of Uttar Pradesh has been making strong efforts to include the ‘Out of School Children’ (OoSC) back into the fold of education, through initiatives such as the ‘School Chalo Abhiyan’, attendance audit of girls in state run schools etc.

Overall, while mainstreaming the children towards conventional subject specific education in schools is the focus, experientially a long term and sustainable remedy points to the need for a pioneering effort. An intervention was needed to be designed so that the stratum consisting of OoSCs, children engaged in income generation activities and children at high risk of dropping out, perceived schools as sources of tangible, relevant and desirable educational gains. This was more likely to engage them and retain them in the educational fold.

Especially flexible and practical learning opportunities were needed for a large number of these children in urban areas.

*Adding to its spectrum of flexible and inclusive initiatives, the UNICEF, UP decided to reinforce the **mainstreaming of children from urban areas who are out-of-school, at high risk of dropping out or are engaged in income generation activities.***

*Accordingly, an **innovative Introduction to Basic Technologies Laboratory (IBT Lab)** initiative was conceived and gradually rolled out, especially for these children in the 11-14 years’ age group.*

*Gradually, however, the need and scope of this intervention was found **suitable for all children** in the age group, including children already enrolled and attending classes in schools. Thus it was extended to include them in the program.*

Kashish, Basic School Naubasta, Lucknow, engaged in her Environment and Energy IBT class



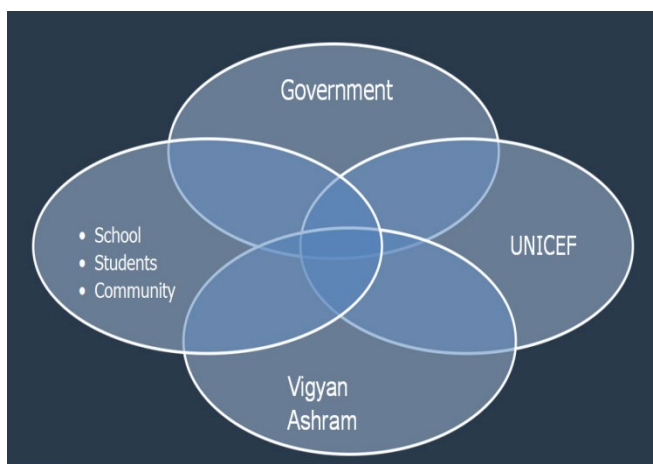
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2. PARTNERSHIP, AIM & CONCEPT:

For implementing this intervention, UNICEF UP, established partnership with the Vigyan Ashram and STARS Forum.

The aim was to provide flexible learning opportunities to out-of-school children, children engaged in income-earning activities and children at high risk of dropping out in 60 pockets of 15 clusters from 15 targeted cities, and gradually absorb them into the regular schooling ecosystem. Organically, the aim extended to encompass accelerated learning for regular school going children in the target age group.

Chart 1:



The intervention was conceptualized with the understanding that 'Dropouts' from the education system are often 'Walk Outs' of the education system. These children and their families consider it a futility to go for book centric education and are unable to find connect between the information in the books and their daily living. They, thus fail to perceive the benefits of conventional education.

As such an alternative approach to education, linking academics to real life was considered essential. Providing education opportunities in schools that encompass real life solutions for students and the community was perceived to have the potential for an appeal among the target beneficiaries. This would also motivate them towards subject specific conventional education in schools. Based on this understanding, 'Introduction to Basic Technology (IBT)' laboratories for the children in the 11- 14 years of age group was considered and established in schools. These laboratories **integrate real life activities and pre-vocational skills with academics & curriculum.**

Gradually, with emerging demand of the intervention from school going children; also realizing its scope in accelerating and widening their scope of learning, its base was widened to include school going children of 11-14 years, in the program.

Activities covered by the IBT classes include:

- making solar cookers
- learning how bicycles work and maintaining them
- making electric cards, complete with electrical circuits
- creating kitchen garden using vertical bag farming
- making vermin-compost
- measuring blood pressure
- testing water
- making edibles such as jam/chikki etc.
- making musical instruments

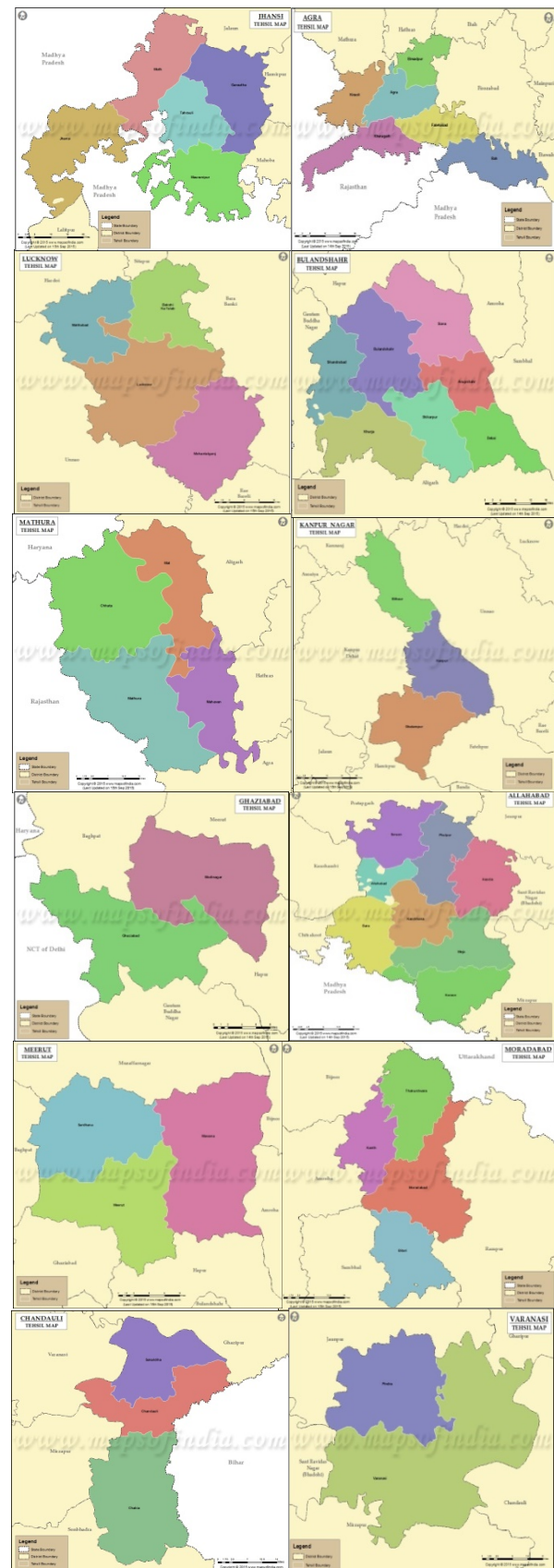
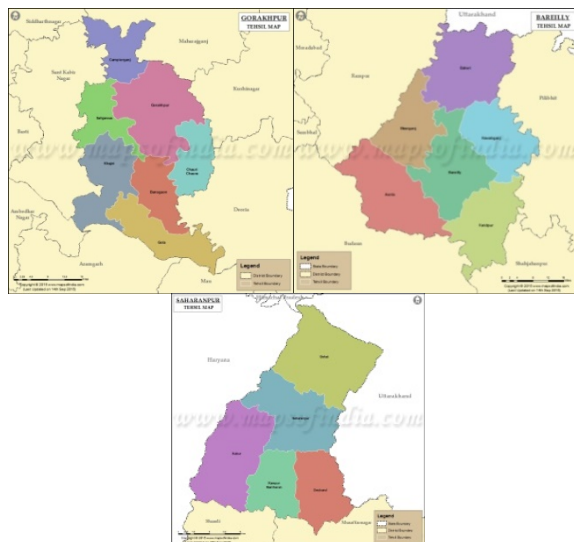
3. THE INTERVENTION IN A NUTSHELL: The IBT program is a **multi-skills program integrated with curriculum.** It was introduced in schools for children in the age group of 11-14 years. In IBT, students absorb by a 'learning by doing' approach.

The children learn through practical classes on 4 themes or topics. The 4 thematic areas that they learn through are **workshop & engineering, energy and environment, agriculture, home and health.** The basic hand tools and required machines including for fabrication, agricultural tools, electrical instruments etc. are provided by UNICEF to the selected schools. Activities selected under these themes are in sync with the class specific curriculum on subjects such as science, mathematics, social sciences etc.

4. GEOGRAPHICAL COVERAGE

The geographical location of the intervention was selected by Samagra Shiksha Abhiyan. **Accordingly, 15 cities from Uttar Pradesh and a cluster of 4 high need pockets within each of these cities were selected for this IBT intervention.** These 15 cities are *Lucknow, Varanasi, Jhansi, Agra, Bulandshahr, Ghazibad, Chandauli, Mathura, Bareilly, Moradabad, Prayagraj, Kanpur, Gorakhpur, Meerut and Saharanpur.*

The chosen cities are apt for the intervention in terms of high prevalence of target children. For example, according to a report¹ published in 2018, Lucknow had a high number of OoSCs and children engaged in income generation activities. There has been coverage² that the financial distress during Covid-19 has made many weavers push their children into the trade and out of schools in Varanasi. Then, there are locations such as Mathura, with high number of dropouts. Thus, a purposive but pertinent selection of locale is evident.



¹ State of Child Workers in India: VV Giri National Labour Institute of India and UNICEF

² ‘Out of Work, Weavers of Famed Banarasi Silk Sarees Forced to Push Kids into Child Labor’: The Wire

5. INTERVENTION OBJECTIVES & PROCESS

The objectives of the intervention are as follows:

- To create school based flexible learning opportunities for out of school children, children engaged in income generation activities and children who were at high risk of dropping out in the age group of 11-14 years
- To promote accelerated learning through ‘learning by doing’ among school going children in the age group of 11-14 years and pilot the intervention to understand the implications, benefits and challenges
- To develop a replicable and up-scalable, contextual and refined model framework for adoption in the state of Uttar Pradesh

Of these, the second objective emerged organically during the course of the intervention.

The **process** of the intervention is as follows:

Survey: At the pre implementation stage, **a survey was undertaken** by the Samagra Shiksha with the support of UNICEF supported partners to identify the OoSCs, children engaged in income earning activities or children at high risk of dropping out of the education system, in the 15 selected cities.

Based on such data, **4 high OoSC prevalent pockets** in each of the 15 cities were **identified**.

Selection of Schools: With the support of the intervention implementing team, **suitable government schools** in these pockets **were selected**. These selected schools essentially had:

- Separate space to set up the IBT lab
- Preferably a proactive team of Headmaster and IBT nodal teacher/coordinator

Structure: **One city, with 4 pockets of intervention, was considered one cluster. Each cluster selected 4 schools, one in each pocket of intervention in the city.**

Thus overall 15 cities and 60 schools were covered by the intervention.

Manpower: Once the schools were selected, IBT instructors were also hired. Often suitable, peripheral candidates were given preference. A total of **4 IBT instructors were hired for each city/cluster**, one IBT instructor in the cluster being hired for each of the 4 pre-vocational topics. Thus overall, there were 60 IBT instructors across the 15 cities/clusters of the intervention.

Child Inclusion: The IBT instructors sometimes met out of school children through door to door survey and mobilized them and their parents to enroll for the intervention.

The schools also selected already enrolled school going children of the target age group for the IBT classes. The head master and coordinator helped in making batches for the IBT labs.

The schools and school going children enrolled in the IBT labs also played a role in generating awareness of the intervention among the OoSCs.

IBT Thematic areas: As already mentioned total of 4 pre-vocational themes/topics were considered for this intervention. These are:

- **Engineering**
- **Agriculture**
- **Home and Health**
- **Energy and Environment**

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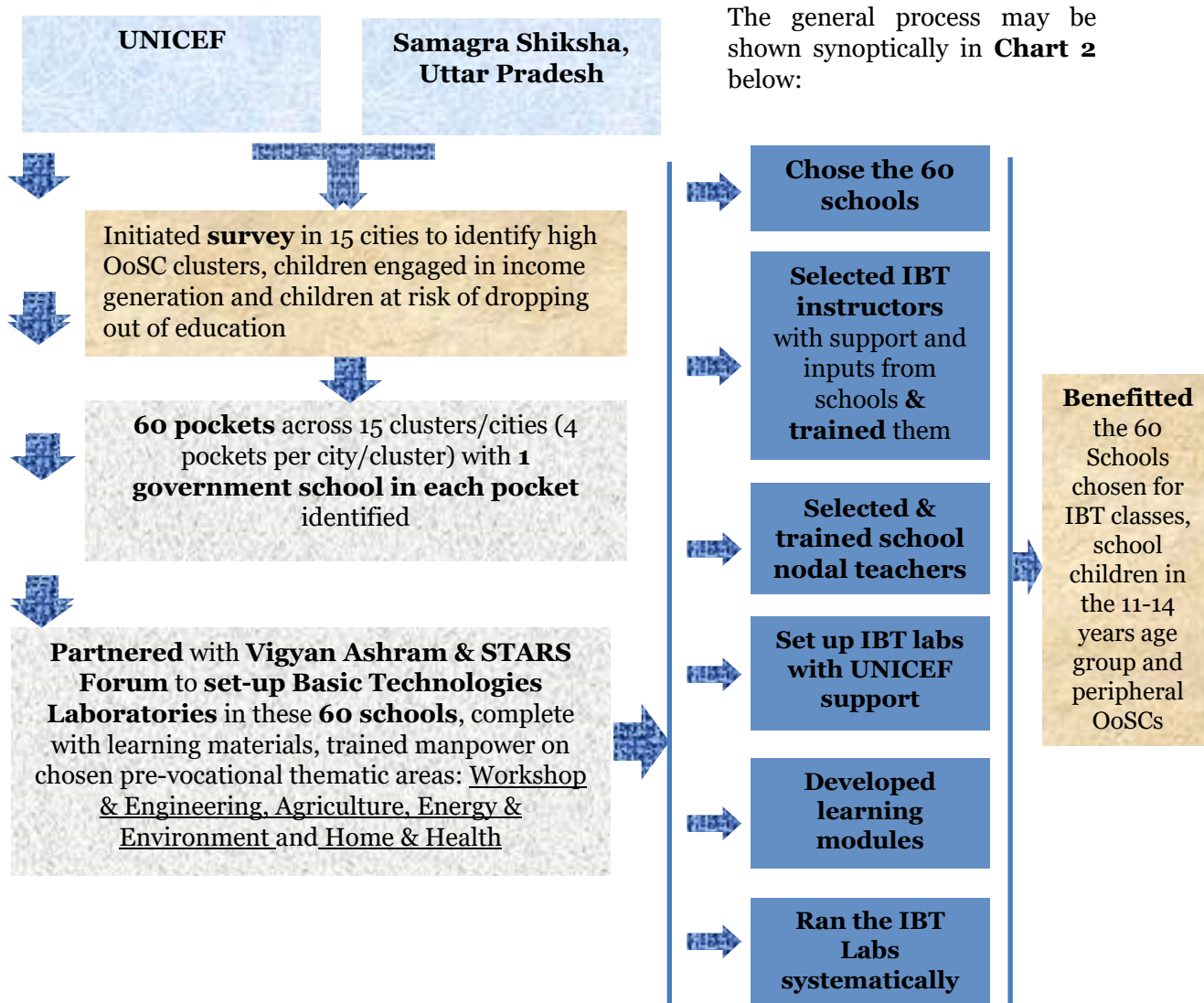
Each of these 4 thematic topics was covered in rotation among the cluster schools.

Thus, among the 4 cluster schools in a city in any given quarter, any one school covered one pre vocational thematic topic; another school covered another pre-vocational thematic topic, the third school covered a third thematic topic and so on. In the next quarter, the thematic topics were rotated.

Accordingly, the IBT labs in each of the 4 schools in a city cluster were also set up every quarter for the particular theme, which was being run in a school IBT lab in that quarter. The labs were rotated the next quarter.

Capacity: It was provisioned that up to 75 children (15 children in one batch) can be trained in a school IBT lab in the 5 days of the week. Each day, a four-hour IBT class is held for one batch of up to 15 children. However, most schools run IBT labs for 6 days and also keep some time flexibility.

Integration with Curriculum: Since the pre-vocational activities are part of ‘learning by doing’, they are chosen so that they may be integrated with academics & the curriculum. These select activities thus develop skill sets keeping in mind the overall curriculum and improve the academic progress of a child. To strengthen this integration process, a school nodal teacher or coordinator, often the science or mathematics teacher, where available, is also selected in each school.



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Training: To capacitate the IBT instructors, a 5-days’ training was conducted for them on their specific thematic topic.

Two-day training was provided to the nodal teachers (who are also called the school coordinators). This training introduced them to the intervention and shared with them the implementation guideline. Other aspects such as records maintenance and monitoring were also covered during this training.

The Headmasters of each of the 60 schools were also capacitated through a short virtual session that introduced them to the program, its nuances and benefits.

Later, a second phase of training, also of 5 days was conceived for the IBT instructors, wherein instructors were trained to understand and carry the activity sessions for each of the 4 pre-vocational thematic IBT courses, rather than retaining expertise on only one thematic area that each of them were selected for.

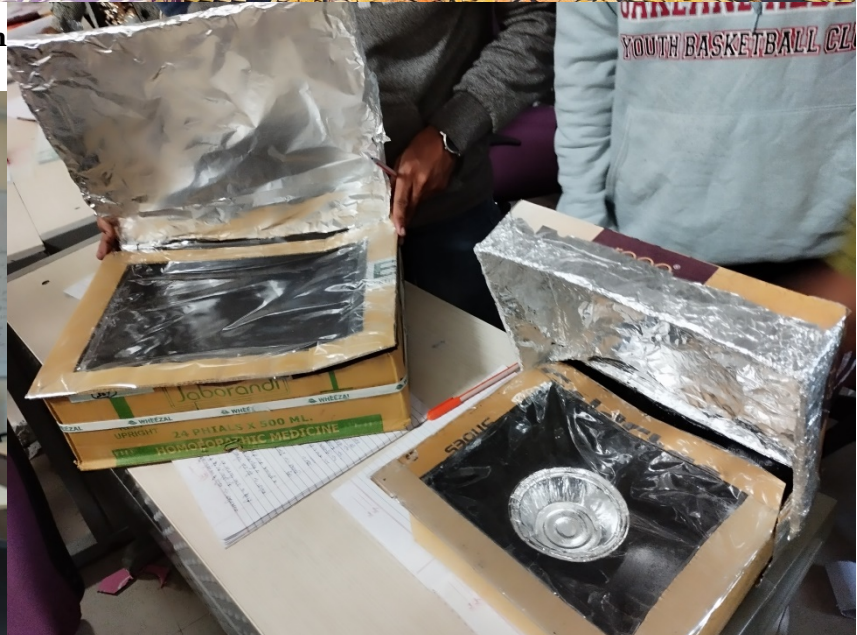
Besides, the IBT instructors, the school headmaster and coordinator were also engaged in a one-day follow up training.

All these trainings in the second phase were centrally held in Lucknow.

The trainees at the second training for the School Headmasters that was centrally conducted in Lucknow



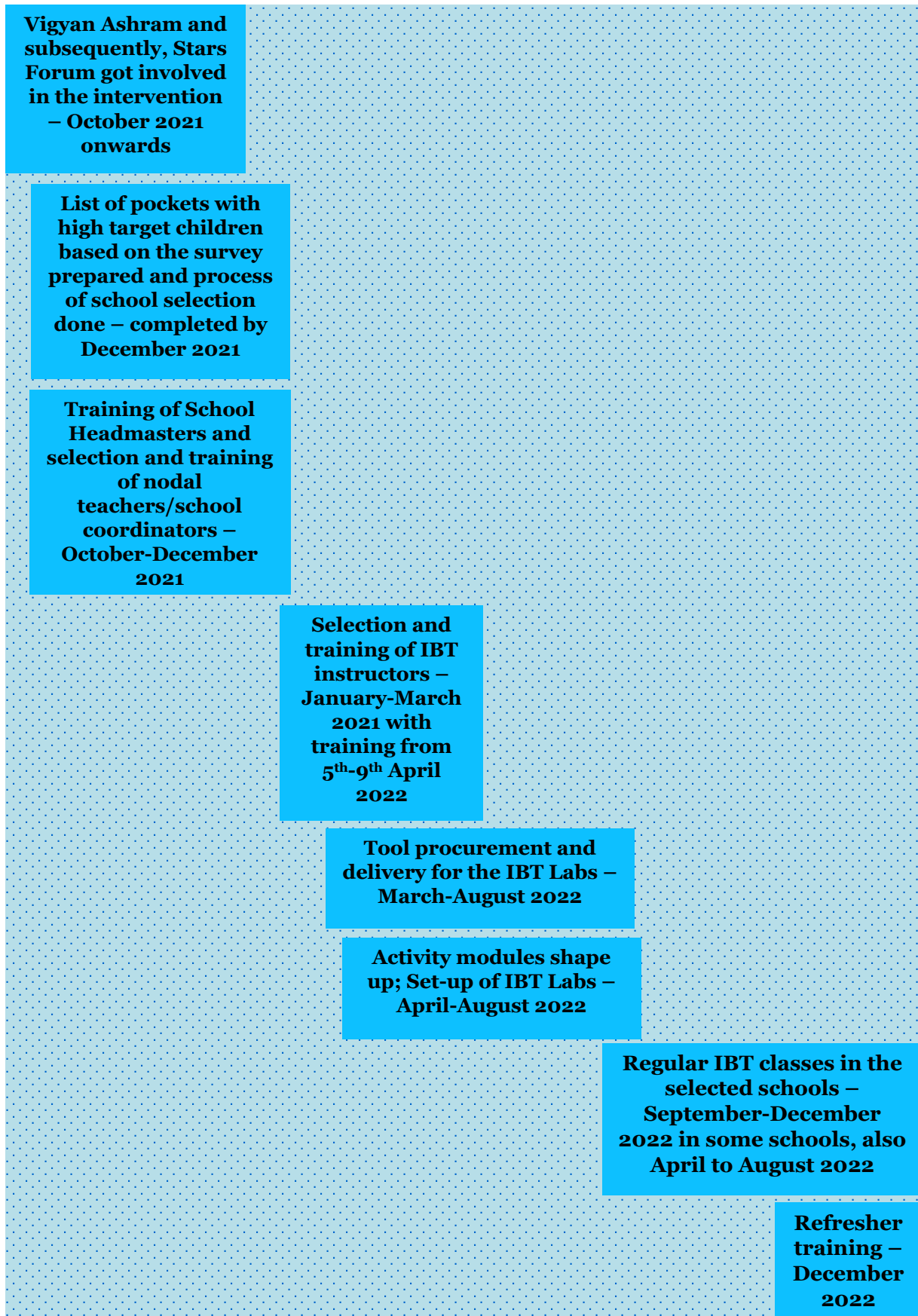
Engineering IBT instructors being trained under Home Health thematic area



Solar cookers made during the training of IBT instructors, by the participants

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6. **TIMELINE:** Overall the various steps of the intervention and the timeline may be shown as below:



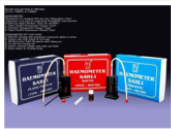
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7. BASIC DETAILS OF THE IBT LABS

The IBT labs were set up in each of the 60 schools of intervention, there thus being 60 such labs in all at a time. There were clear specifications about these labs since effort is made to ensure that infrastructure constraint does not affect the program negatively. **Thus each lab was to be at least 300-400 sq. feet in size. The door size of a lab was to be at least 6 by 3 feet. Care was taken to see that there were no infrastructure glitches, such as leakage within the lab.**

There is also a **list of tools or items** with which every lab was equipped, given that each school were to get the 4 labs in rotation.

Part of the tool list for the Home and Health IBT Lab

50	Haemocytometer	Top tech brand	Other	No	1	
51	HCL	N/10	Biolab	200 ml	1	
52	H2S bottle Bactoscope-water test	10 bottles in 1 set	No.	No.	2	
53	Packing machine		standered	No	1	

include a wide range of items ranging from stainless steel sieves to measuring mugs, digital blood pressure machine and thermometer to aluminum foils.

Likewise, the 'Agriculture' lab also has a complete list of items that it needs. These include plastic jar, crate, buckets, lactometer, knapsack pump, soil testing kit etc.

The 'Energy and Environment' lab is also required to be equipped with a wide range of items such as wire gauge, voltmeter, linesman pliers, razor blade knife, hacksaw, hand drill machine etc.

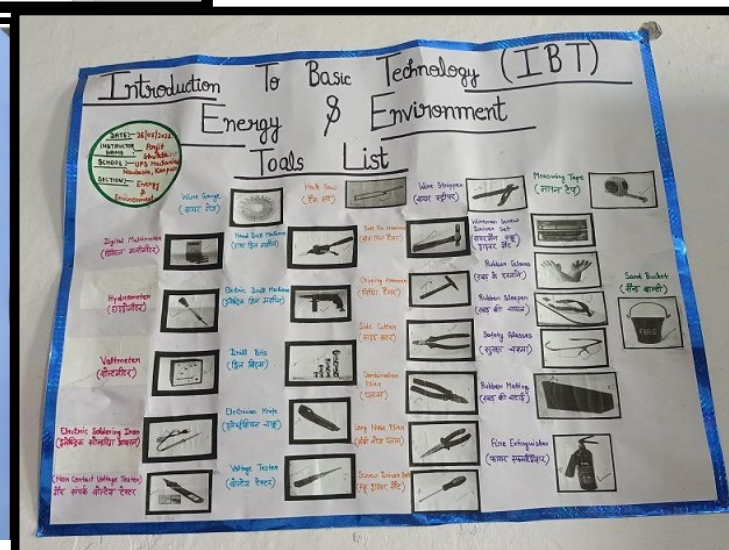
The 'Workshop and Engineering' lab is equipped with items such as steel ruler, spirit level bottle, tenon saw, karvat, iron plane, farmer chisel etc.

Thus, each of the labs have very different but specific set of tools that are required to make the lab functional and to provide a hands on activity based experience to the students.

Tool diagram for the Energy & Environment IBT Lab

16	✓	Knapsack Pump		Standard IS	each	1	
17	✓	Measuring Tape	100 ft cloth tape	Freemans	No.	1	
18	✓	Weighing Balance	50 KG	Standarded	No.	1	
19	✓	Lactometer		Standarded	No.	1	
20	✓	Measuring Cylinder		Standarded	No.	1	

Part of the tool list for the Agriculture IBT Lab



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**Agriculture
IBT lab at
Sadar Bazar
school,
Kanpur**



**Energy and
Environment
IBT lab at UPS
Composite
School,
Naibasti,
Jhansi**



**Home and
Health, IBT lab
at Composite
School,
Ashoknagar,
Agra**

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Activity on plantation: introduction to seeds, plantation, and different methods of plantation, time taken to grow into a plant, processes and elements required for the same etc. in a class on Agriculture

3. गतिविधि शीर्षक: बीज अंकुरण की गति बढ़ाने हेतु बीजोपचार

पाठ्यक्रम सन्दर्भ: कक्षा-6 पाठ सं-03 एवं 06 उर्वरक/बीज

आवधारणा/संकल्पना:

मिट्टी की तैयारी और बीज दूर की गणना के बाद, बीज को मिट्टी में लगाया जा सकता है। बीज बोने से पहले उन्हें उपचारित करने की आवश्यकता होती है। बीजों के अंकुरण में सुधार के लिए बीज उपचार सहायक होता है। यह माइक्रोबियल या अन्य कीट संक्रमण से बचने में भी मदद करता है। बीजों का उपचार रासायनिक या प्राकृतिक योगिकों की सहायता से किया जा सकता है। हम स्कूल में कुछ बुनियादी बीज उपचार विधियों के बारे में जानेंगे।

उद्देश्य:

- बीज बीजोपचार करना सीख सकेंगे।
- बीज जमाने (अंकुरण) के प्राथमिक चरण समझ सकेंगे।
- बीज अंकुरण के लिए अनुपयुक्त बीजों को पहचान सकेंगे।
- बीज अंकुरण दर के अनुसार अच्छी फसल हेतु निश्चित मात्रा में (उपयुक्त) बीज लेना समझ सकेंगे।

आवश्यक सामग्री:

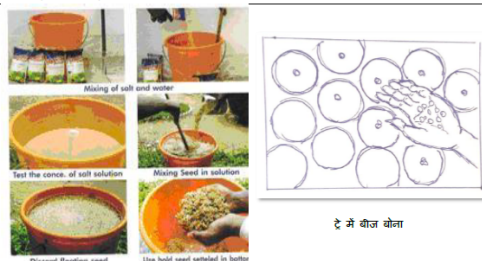
संख्या में 100 अथवा 100 ग्राम बीज के आकार के अनुसार विभिन्न प्रकार के बीज (जैसे मूंगफली, मटर, काना चना, हरा चना, गेहूँ, बाजरा, सरसो, मसूर, अलसी, उड़द व मूँग आदि)

आवश्यक उपकरण:

आयताकार अंकुरण ट्रे, छलनी, तराजू, मापक पात्र (500 मिली), तसला, बाल्टी, हजारा

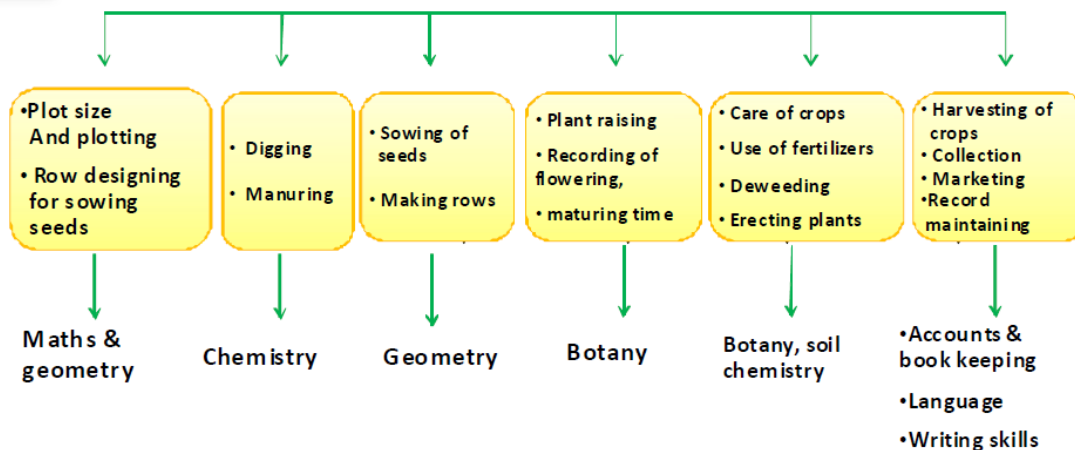
आवश्यक समय:

- बीज के प्रकार के आधार पर 30-45 दिन
- बीजोपचार का प्राथमिक समय: 60 मिनट
- प्रतिदिन, पानी छिड़काव एवं अवलोकन लेखन समय - 5 मिनट



Making LED torch using DC batteries

Skills	Topics covered from curriculum
- Preparing basic design of circuit. - Assemble LED units - Cable joints, insulation - Costing / Price / Sale	- Ohms law. Electric circuit – Series / Parallel - Calculating energy requirement - Design/ art/ creativity



Gaziabad



Mathura

Thus, simple activities such as repairing a bicycle, making LED torch using DC batteries, doing agricultural activities and preparing nutritious porridge are improving the knowledge of children on various topics covered in their curriculum.

9. INTERVENTION REFINEMENTS AND EXTENDING THE SCOPE OF INTERVENTION TO ALL CHILDREN

The on-going intervention is emerging, with changes and refinements being conceived based on current experiences.

For example, as has been mentioned already, each IBT instructor has been capacitated to lead the activity sessions for all of the 4 pre-vocational themes/topics of the IBT courses. This will be useful in the future, as it will imply that each IBT instructor would have the capacity to take classes on any of the 4 IBT topics.

Hence the rotation of the IBT instructors will not be necessary and the attachment of each IBT instructor with the students of a school may be higher owing to regular interactions.

Another important refinement that the intervention incorporated is extending it to all children, with inclusion of currently enrolled, regular school-going children.

Based on field level interactions it appears that a large number of the 60 schools chosen for this intervention enrolled regular school going children in the 11-14 years age group, in the IBT labs.

The experiential understanding is that in such cases this has overall increased the children’s interest in studies, improved the depth of their understanding and aided and accelerated their learning process. This shows the high scope and need of extending the intervention to all children.

This approach would also be in keeping with the National Education Policy, which focuses on an inter-disciplinary approach for all school-going children in India rather than a conventional, content-heavy, and rote learning approach.

Headmasters, coordinators and IBT instructors have mentioned that there is demand among regular school going children for joining the IBT labs. These children, some of whom were selected to join the IBT labs are learning things faster and retaining their learning better. In fact, there is discontent among regular school going children who have not been linked to the IBT labs, as they see other children using it. Such discontent can be challenging for class and school cohesion.

Stakeholders, such as headmasters have suggested alternative approaches, mentioning that regular school going children should be introduced to the IBT labs first and based on the interest it creates in the community about the intervention, peripheral OoSCs will also get organically motivated to join the IBT classes and then enrolled in the schools. In some cases, the school authorities also mentioned that all peripheral children had been already enrolled earlier through regular efforts of the school and thus restricting it to OoSCs is limited in scope.

Owing to all these reasons, there is strong rationale for the intervention to be inclusive for all children in the target age.



Head Master, UPS School Zone 2, Chinhat, Lucknow, who vociferously advocates the intervention for all children in the target age group

10. THE RESULTS MATRIX

Based on qualitative interactions with some of the core stakeholders, the outcomes of the intervention are shared in the results matrix below:

The intervention has strengthened universal access to education, with a veritable number of OoSCs being motivated through this initiative to come to school regularly



As a result of this intervention, as many as **5,370 out-of-school children** (2,797 boys and 2,573 Girls) in 60 schools in the 15 targeted cities **were mainstreamed** to school. A good share of these children had dropped out of the schools ever since covid closure.

This has been possible despite a time span of 8 months or lesser since the IBT labs at the 60 schools were initiated, with delayed start in several schools owing to reasons such as lack of immediate availability of suitable IBT instructor or delay in receiving the tools for the IBT lab etc.

The intervention saw a gradual but definite transition from being a supply led intervention to being a demand driven one



The enrolment in the IBT centers has gone up phenomenally in the few months of the intervention. As a consequence, **most IBT centers are now enrolled to full capacity**, with more children from the school itself or even from peripheral schools eager to enroll.

There has also been a definite keenness in the teachers and headmasters towards the intervention. This has been achieved in the brief period that the intervention has been running, since a good share of them were unsure or skeptical of the intervention at the onset.

Instead, now cases have come to light where headmasters from neighboring schools are requesting for the intervention in their schools as well.

The intervention proved to be child-friendly, replicable, sustainable and gained recognition



Motivated by the success of this pilot intervention, **the state has planned to implement "Learning by Doing" program in 2,500 centers** across the state to provide pre-vocational exposure to these children and develop multi-skills among them in accelerated manner.

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The initiative showed the need and the scope for up-scaling the intervention to accelerate the learning of all children in classes VI to VIII and not only being limited to out of school children



A good share of the 60 schools has made the IBT intervention inclusive for the already enrolled and regular school going children.

The headmasters, teachers and the students have unanimously pointed to the demand and need of the intervention for all children, including regular school going children. Teachers and headmasters have mentioned that the exposure to the IBT labs and activities has increased the enjoyment and interest in studies, improved the sphere of learning, improved retention and ensured accelerated pace of learning among regular school going children already enrolled in school. In **several cases** it has been noted that the **attendance and regularity of school going children in the 11-14 years age group have gone up ever since the IBT intervention started.**

The intervention has ensured positive vibes and perception of the parents of the children, towards the usefulness and practical benefits of school education

There is a gradual change in the perception of the parents towards the schooling system. They now consider the school as **capable of equipping their children towards real life gains** as against their previous perception of schools being theoretical in approach.

11. THE EMERGING STORIES

"There are so many things that the children learn while doing the activities even beyond what the activities can teach.

For example, when they are working out the costing, they get to learn and practice mathematics."

**IBT Instructor,
Bulandshahr**

"The children are translating their new IBT learning into practice. Only yesterday, a plug in the classroom was not functioning. A class VI student repaired it with his new found knowledge.

Children feel happy when they can do such things."

**Head master, Composite PMV,
Hazaripur, Gorakhpur**

"From their Agriculture pre-vocational classes, the children learn about various things like planting a seed, taking care of saplings, photo synthesis, types of soil, water testing etc.

Most of them find these learning useful in real lives and in their small time agricultural activities."
IBT instructor, Agra

"We have children in the classroom, who worked as rag pickers earlier. Their parents were totally averse to their coming to school. They had a notion that children seldom learn anything in school that is of much use.

Now, both the parents and the children are excited. There is faith that they will come to school and learn something that will be suitable and useful for practical life."

IBT Instructor, Saharanpur

"Earlier it was a challenge getting children to the labs and the classrooms. We could barely get 4-5 children to the labs. Now even after the full quota of 15 children, more children want to attend the classes."
**IBT instructor,
Jhansi**

"Several children were engaged in various types of petty income generation activities earlier.

Now too, especially after attending the Home and Health classes, they have a tendency to make jam, jelly, chikki etc. and sell these. But despite such inclinations, they are now no longer sliding back from school. They look forward eagerly to come to school."
IBT instructor, Kanpur

THE FASCINATING LABS: ‘Learning by doing’ multi skilling facilities in lower-secondary schools, ensuring improved enrolment & accelerated learning

UPS School, Chinhat, Lucknow: The IBT class on ‘Agriculture’ has commenced very recently in UPS School, Chinhat. The tools are neatly kept in the IBT lab.

The IBT instructor, Mr. Rakesh Kumar Singh is refreshed from the recent 4 days’ training and intent to lead the children on other themes/topics of the IBT intervention, such as Energy, Engineering and Home and Health. However, his current focus is on ‘Agriculture’.

“Yesterday,” he said, “we measured and prepared the field for the agriculture work to commence.” He proudly directs attention to a piece of land lying at one end of the school.

The Headmaster is also enthusiastic. He quickly rounds up the children who had participated in the field measuring and preparation activity the day before.

“So tell me,” he asks, “what have else you learnt from this activity yesterday? What is the shape of that field that you have prepared?”

Anuj, a class VI student, answers promptly. “Sir,” he says, “it is in the shape of a rectangle.”

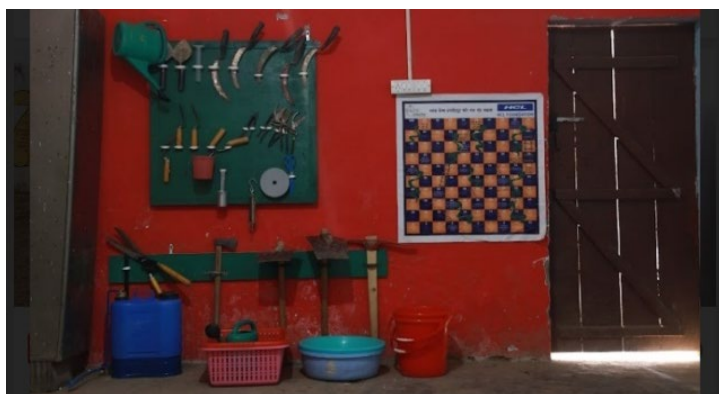
“Ok,” the headmaster nods in contentment and decides to move beyond. “So, do you know the size of the land that you have prepared?”

“Yes sir,” a student of class VII answers promptly. “We know the length and breadth and computed the area by multiplying the two.”

The IBT instructor is happy. “We will not only be able to tell them more about plants and good agricultural practices for growing trees but also about scientific methods such as photosynthesis, through these classes.”



Land prepared by the students of the IBT intervention at UPS Chinhat, Lucknow, for their Agriculture lab activities



Tools for the IBT Lab



Anuj, UPS Chinhat, Lucknow, sharing his recent learning from the IBT lab

THE FASCINATING LABS: ‘Learning by doing’ multi skilling facilities in lower-secondary schools, ensuring improved enrolment & accelerated learning

Prayagraj: Rohit Jaiswal, 12, had an important role in the annual mango pickle making ritual at home this year. He assisted his mother in cutting the raw mango, coating it in salt and turmeric, and finally mixing it with spices and oil.

“Mango pickle is made every year at home but this time I did the masala with my mother,” said the happy Rohit. He has also prepared laddoos and peanut chikki at home recently with his sisters.

A native of Chakbhatai, Naini, Prayagraj, Rohit learned these skills as part of the Introduction to Basic Technology (IBT) program in school. He has also learned many other skills including welding, electrical works, gardening, blood pressure measuring, blood group testing, etc.

Rohit lost his father some years ago after a long illness. His mother and younger sister started working as domestic help to keep the family going. While the elder sister got married, Rohit also started working at a garment shop to contribute to the family's income.

“We could not study because we had an ailing father and no proper source of income. But we wanted Rohit to study. He was enrolled in school but he wasn't very keen. He did not enjoy his studies at all. So he stopped going to school. It is only when these trainings started in school that he has started liking school and is eager to go to school every day,” said Varsha, Rohit's elder sister.

“My child is coming back and making very interesting things at home. I hear there is some new class that is on-going in school where they learn to make different things and also this improves them in their studies. It is a good initiative. Such initiatives should continue.”

**Mother of school going child,
Chandauli**

Rohit wants to start his own business when he grows up. “I would make a good earning and my mother will not have to go out to work,” he says.

He recollects that the learning home and health classes helped him with making a number of food items such as pickle. His friend and he have even sold part of what they made. Rohit feels that such small exercises are helping him build his soft skills and confidence while his IBT classes are also strengthening his understanding of costing.

He is confident that these skills will come in handy when he tries to set up his own business.



Rohit in his IBT lab, Allahabad

THE FASCINATING LABS: ‘Learning by doing’ multi skilling facilities in lower-secondary schools, ensuring improved enrolment & accelerated learning

Composite PMV, Hazaripur

Gorakhpur: Children at the IBT lab are currently learning how to make a solar cooker from simple, everyday items. This is under their ‘Energy and Environment’ IBT lab, which has commenced from December.

Just prior to this, they have also participated and learnt from their IBT classes on Engineering.

The IBT instructor, Mr. Himanshu is involved in the activity. He mentions how he generally starts by drawing and explaining diagrams and the process of the activity. He then moves on to the activity itself. Once the activity progresses, there is a break for question answer sessions.

He is eager to explain how the themes and the activities are well integrated to the children’s curriculum.

“Please take the example of this simple activity of making a solar cooker,” he says.

“Through it, I can teach them the difference between renewable and nonrenewable energy and why clean energy is important to our environment.

I can also lead them to create or improve their knowledge on light rays and how the rays move in a straight line; the concept of reflection; the concept of reflection and how darker colors absorb more heat because we tape the edges with black paper; the concept of temperature as we experiment by trying to heat water on this cooker...this also enables scope to explain to the children on water boiling and freezing temperatures etc.”

He is content in being able to prove his point.

The school coordinator and school headmaster are also both very enthusiastic about the intervention although the headmaster is slightly concerned about how to extend the program to all children in the respective classes.



The IBT instructor, Mr. Himanshu with two children from the IBT class – Pinky and Ridhan

THE FASCINATING LABS: 'Learning by doing' multi skilling facilities in lower-secondary schools, ensuring improved enrolment & accelerated learning

Sonam, Gaziabad: Sonam is 11 years of age. She belongs to a rather conservative family and stays at Bijay Nagar at Gaziabad. She was not encouraged to go to school. Besides, her father, a painter, also used to feel that do not have the means to send her to school.

Thus Sonam used to stay at home. From time to time she used to interact with other children in the neighborhood who used to go to school. She then used to make her limited small efforts to learn something from them.

At this time, the teacher from the peripheral school got to know about Sonam and after discussion with her parents, enrolled her to the IBT classes. In these classes on Home and Health, Sonam learnt to make several edibles. She also learnt to make useful things such as masks.

Composite School, Kesharipur, Varanasi: The children in the IBT class are focused. They are today learning to make musical instruments, such as simple flutes. Once done, they will play with these self-made flutes.

The school coordinator, Mr. Umesh Tripathi is very happy with the program. "It is helping the children to learn things that are already in their syllabus. They are connecting better and learning both by doing and observing.

Today, Sonam and her parents are quite happy with the IBT classes. They all want that Sonam should go to school regularly and study. This will make for her better future.



Sonam at Composite School, Pratap Bihar, Gaziabad

In our school, the regular children have been encouraged to join the IBT labs. Children have noticed the friendly, fun way that things are done. So, all of them want to participate."

The IBT instructor points how the children are learning important topics such as speed of sound and also about sound waves and length while doing this simple exercise of making flutes.



Children at the Composite School Kesripur, making musical instrument at their IBT class, under the guidance of their IBT instructor

THE FASCINATING LABS: ‘Learning by doing’ multi skilling facilities in lower-secondary schools, ensuring improved enrolment & accelerated learning

UPS Composite School, Machhariya,

Kanpur: The children in the 11-14 years age group have just started their IBT classes on agriculture. They have already completed two IBT classes here, the first on Energy and Environment and the second on Home and Health.

Savita Tripathi, the headmistress had a wide range of thoughts to share. “We have not received any list of OoSCs but the IBT instructors and sometimes our teachers did door to door visit to try and motivate children who are engaged in income generation, to come to school. As a result of this effort and the children’s interest in the IBT classes we were able to bring back some of these children into the fold of education.

It is, however, not easy to enroll and retain them in schools. Sometimes the teachers may also find it burdensome to proffer special attention to these children to close their learning gaps. I sometimes pull up books from the junior sections and sit with a few of these children who were not enrolled in school and were either sitting at home or were engaged in income generation activities. Then I try to build their base and close their learning gaps so that they may gradually be able to achieve age and class appropriate learning levels.

Savita Tripathi, Head, Composite School, Machhariya, Kanpur, at the school



The children also have a tendency of missing classes and using the day to earn something. But the IBT classes gave them and their parents the idea that they may learn new things in school, which may be relevant to their practical life and provide them with better income earning opportunities in the future. *That* is attractive to them.

The children enrolled in schools also find the IBT labs very catchy. They see these labs as a lot of fun and a scope to learn new things. They are always raring to join the labs.”

Humja, who was not enrolled in the school earlier, learnt about the IBT lab from one of children enrolled in the school and attending the lab. This is when Humja joined the IBT lab. She used to be engaged in some car cleaning activity. But gradually, with greater interest in IBT labs and consequently increasing interest towards school, she was enrolled, and although somewhat irregular, has started coming to school.

Lubna, is another success story of the IBT intervention. Ilma, who was already enrolled in school and had started attending the IBT classes, told Lubna about it. Ilma, also used to make solar cooker or play a role in developing a cooler, while participating in the IBT class. It is these devices that attracted Lubna and motivated her parents to send Lubna to school. Today, Lubna comes to school regularly.



Ilma at their IBT class

THE FASCINATING LABS: ‘Learning by doing’ multi skilling facilities in lower-secondary schools, ensuring improved enrolment & accelerated learning



Uma Bano’s mother comes to have a word on the IBT labs

Uma Bano had dropped out of school. She had typhoid, which left her weak. But even when she recovered, her mother did not enroll her in school. Gradually months became years and Uma stayed at home. Then, the IBT intervention happened and the IBT instructor got in touch with her mother. On learning about the program, her mother could relate to it in terms of real life benefits and thus Uma Bano was registered for the IBT classes. Gradually, as she started attending the classes and went home with knowledge of new things, often making things at home with the knowledge acquired in IBT classes, her family realized the importance of school. Uma is now enrolled in school and comes regularly.

The happiness on the children at the mere mention of the IBT classes is palpable.

They have only just commenced with the Agriculture classes but while preparing the field for their agriculture activity, they have also planted a flower, which Mantasha proudly shows.



Mantasha, Composite School Machhariya, is delighted to pose beside a plant they have potted in their Agriculture IBT class

“The regularity of students in class was average. Even in IBT classes, we were not keen to send too many students at the offset. But now we have all started seeing its benefits. Our students are always waiting for their next IBT class. In fact, even the attendance of our students in class has gone up because they find it more interesting coming to school.”

School Head Master, UPV, Kamela Colony, Saharanpur

12. SUGGESTIONS AND RECOMMENDATIONS

Stakeholders across the spectrum ascertain the appeal, efficacy and pertinence of the intervention. At the same time, some rumination on a few diverse aspects may be suitable:

- The intervention has set specifications of basic infrastructure, such as room size, room condition etc. This is relevant and in fact, necessary. This set may be further refined to encompass other aspects such as security. For example, there are schools where spacious and airy rooms in better school location could not be selected for IBT labs for security reasons such as weak doors or doors without locks, for fear of the lab equipment getting stolen overnight. Hence addressing such concerns could be to the betterment of the intervention.
- The IBT instructors play a pivotal role in the intervention and sometimes mobilize peripheral OoSCs and children engaged in income generation activities to enroll and participate in the IBT initiative. In such a situation, where interaction with the community is essential, providing the IBT instructors with an identification card could be helpful. This could ensure better trust building among the parents and community and a greater conviction in what the IBT instructors have to say.
- Developing and sharing the functionality framework of the IBT instructors with the school authorities, such as the headmasters, could be useful. This will enable realistic expectations. Overall, an atmosphere of cohesion can be strengthened when functionality and interaction framework is defined.
- Certain challenges were perceived in enrolment of OoSCs and children engaged in income generation in IBT labs. As of now, there are concerns in schools about how their enrolment may impact regular school going children and the general atmosphere in schools.

Transparent discussions with head masters and participative solutions may be the base for consensual guidelines towards process of selection and enrolment of such children in the IBT labs and eventually to the schools.

- Sometimes without quick enrolment in school and regular follow up, the OoSCs and their parents tend to lose motivation easily and slide out of the education net. Hence such mechanism may be inbuilt into the program.
- Bridging the age and class specific learning gaps of OoSCs is important for their retention. This is especially germane to those children who have dropped out of the school ecosystem for a long duration. Hence mechanisms to close their learning gaps may be inbuilt into the program.
- If this intervention is to be up-scaled to include all school going children in the age group of 11-14 years, time management and scheduling could become pertinent. Developing lesson plans to cover the curriculum, while leaving time provision for the IBT classes, could be useful. Likewise, more and more integration of the IBT modules with the syllabus may be considered so that these IBT classes may not only complement the theoretical lessons but at some level even replace part of the conventional classes.



The IBT program started off as a pilot initiative. It made perceptible contributions in mainstreaming children who had dropped out of the education system during the covid-19 tribulations.

However, it went beyond and showed how it can be a landmark program for all target children at lower secondary levels.

Even over a relatively small period of time, its ‘learning by doing’ approach that tried to make a conscious shift beyond ‘book based education’ and towards ‘work based education’ showed encouraging outcomes. It resulted in increased attendance, reduced dropout, and increased grade level competency among the children in Mathematics, Science, and Languages.

The success of the model has been pivotal in motivating the state to consider expanding this across 2500 centers in the state. These school based centers will provide pre-vocational exposure to these children and develop multi-skills among them in accelerated manner.

A landmark program has thus been initiated. A tremendous opportunity is thus unfolding systematically for the children, whose skill sets, learning pattern, knowledge and perspectives this program is likely to touch.

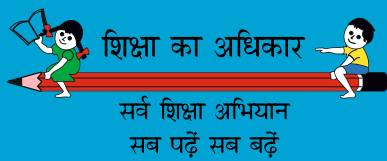
ANNEXURE

IBT – Introduction to Basic Technology

OoSC – Out of School Children

PMV – Purv Madhyamik Vidyalaya

UPS – Upper Primary School



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