Ambassadors of Change

Intel® Education inspires young Indians to show the way

Foreword

It is now ten years since the Intel® Education Initiative was launched in India. As part of a sustained global commitment in which Intel invests USD 100 million annually across 50 countries, the Intel Education Initiative aims to prepare students across India with the skills required to thrive in the knowledge economy. To this end, Intel has been working with government and other decision making bodies at the central, state and local levels to improve teaching and learning through the effective use of technology, in both formal and informal educational environments.

A million teachers across India have learnt to integrate technology into the way they teach—and thereby enhance student learning—through the Intel Teach Program, while the Intel® Learn Program has helped to promote technology literacy and 21st century skills among tens of thousands of underserved youth aged 8 to 16. Brilliant young minds have won international recognition through the Initiative for Research and Innovation in Science (IRIS). Intel has also being working with key institutes of higher education to move technology out of university labs and into local communities through research grants, technology entrepreneurship forums, and mentoring by Intel technologists

But the real impact that the Intel Education Initiative has had lies in the difference that these programs have made to the lives of the teachers and students they have touched, as well as to their families and to the communities they live in. While this impact cannot be measured in numbers, we have attempted here to capture some inspiring examples of how, empowered by their newly acquired knowledge and skills, teachers and students across the country have challenged the status quo and brought about much needed change in their communities.

Ambassadors of Change salutes the spirit of these exemplary young Indians who have harnessed technology to address complex social and developmental issues. Our desire is to honour their efforts, and to motivate others to contibute similarly towards a vibrant new India.

Praveen Vishakantaiah
President
Intel Technology India Pvt Ltd

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Intel® Education Initiative

Intel believes that students everywhere deserve to have the skills necessary to become the next generation of innovators.

- We are actively involved in education programs, advocacy, and technology access to enable tomorrow's innovators.
- Intel has invested over USD 1 billion and Intel employees have donated over 2 million hours in the past decade towards improving education in 50 countries.
- Intel works with governments, local NGOs and academic institutions through public private partnership for improving education around the world.

Intel® Teach Program

The Intel Teach Program offers teachers proven professional development supporting 21st century skills. Intel Teach courses promote student-centred approaches and help teachers transform instruction to engage students in deeply relevant ways, with appropriate use of technology for learning, creativity, and communication. Intel Teach is the largest, most successful program of its kind.

Intel has trained more than 5 million teachers in over 40 countries, and will train 8 million more by 2011.

In India, Intel Teach was launched in February 2000. Since then, Intel has worked with governments in 19 States and Union Territories, as well as with Central Government bodies, to train over one million teachers, as of December 2008, in schools and pre-service institutions across the country.

Intel® Learn Program

The Intel Learn Program is delivered in informal education settings, and provides opportunities for young learners in developing countries to learn key skills needed for tomorrow's success, with a focus on technology literacy, problem solving, critical thinking, and collaboration.

Intel Learn has helped more than 660,000 learners in nine countries (Brazil, Chile, China, Egypt, India, Israel, Mexico, Russia, and Turkey) develop skills for success.

Since its launch in India in June 2004, Intel Learn has impacted over 85,000 learners across 15 states and Union Territories, bringing about a quiet revolution in the heart of rural India.

Initiative for Research and Innovation in Science (IRIS)

IRIS, constituted jointly by Intel, the Departmet of Science & Technology, Government of India, and the Confederation of Indian Industry, is the largest science fair initiative in India.

IRIS is affiliated to the Intel International Science and Engineering Fair (Intel ISEF), which is the world's largest pre-college science competition, bringing together millions of young scientists to share ideas, showcase cutting-edge science, and compete for scholarships. The competition encourages students to tackle challenging scientific questions through authentic research practices to solve the problems of tomorrow.

The IRIS National Fair is conducted annually in India for students who compete in 10 subject categories. Winners at the National Fair represent India at Intel ISEF held in USA in May of the following year.

IRIS has reached out to about 1.5 million students across in India, and since 2000, students representing India at Intel ISEF have won over 54 awards.

Intel® Higher Education

Intel® Higher Education advances technology innovation in collaboration with universities and governments worldwide. The program focuses on research and entrepreneurship activities to pursue technical degrees, and helps move that technology out of university labs and into local communities through research grants, technology entrepreneurship forums, and mentoring by Intel technologists.

In India, the program has reached out to over 20,000 students and 1,500 faculties across 300 institutions. Out of these institutions, Intel India works closely with 35 institutes for research and curriculum development.

A Dream Takes Wing

Anita discovers a whole new world with technology

"It is only through the Intel Learn Program that I can now do what other children can do—and I feel very happy about it."

Anita

Eleven year old Anita's father, Putti Lal, could not support his daughter's education with the measly salary he earned as a daily wage labourer. Anita also had special needs: she is deaf and mute, and, unfortunately, did not have any interest in education. But despite dropping out of school, she continued to dream—of a world where she could communicate freely and participate in its wonders.

Early in 2007, Anita noticed a woman talking animatedly to a group of children in her village, Dadumajra, near Chandigarh. The excited voices of the children attracted Anita and she moved closer. She picked up some words the *woman* was using: school, dreams, free, computer and education. Anita was curious, and with the help of some of her friends, she learnt that the woman—the *didi*—was a staff at the nearby Alternative Innovative Education (AIE) centre , set up under the Sarva Siksha Abhiyan at the Government Model Senior Secondary School in Sector 38 in Chandigarh. The *didi* was in Anita's village to convince parents and children alike to enroll for classes there. Excited, Anita convinced her parents to enroll her so that she could "play with computers."

Initially, Anita's peers would tease her relentlessly about her special needs, and her challenge became even tougher. The teacher delivering the Intel® Learn Program to the students, Mr Madan Lal, however, noticed Anita's enthusiastic response towards computers and in creating projects.

Each time Anita typed on the keyboard, it was as if she had entered a whole new world. She could now use computers as a medium to express her views and ideas. She had been given a voice. Although she was not literate initially, she used graphics to express her opinion. She would draw a smiling face when she was happy and a sad one when she was upset. Because of her enthusiasm, she was soon ahead of her class in learning new skills, and her peers now started respecting her.

In addition to technology and communication skills, Intel Learn had given Anita the confidence to believe in her dreams. Gradually Anita could draw, paint, write, calculate and prepare presentations using computers. She now realized that the world of education was interesting after all.

In 2008, Anita enrolled herself in Class 2 of a mainstream school, where she attends classes along with other students. Here, too, she continues to do well. Intel Learn has given wings to her dreams.

Singodi Wakes Up

Spirited school girls mobilise a community to clean up their act

"Almost everyone in the audience was visibly moved by the presentation made by the girls. It was an eyeopener for the villagers of Singodi, who couldn't comprehend how they could have been so ignorant on such an important issue."

Amit Mishra
Teacher, Astha High School

Five spirited girls—Shefali Jain, Ankita Jain, Prathiba Jain, Suman and Kusum from Astha High School—were very disturbed with the hygiene and sanitation in their village Singodi, in Madhya Pradesh. Any effort that they made towards improving the situation was always futile as they were scoffed at by the local boys and the community elders alike. Girls in Singodi were *not* supposed to raise social issues!

Fortunately, these girls were among the children from nearby villages and schools who had enrolled for training under the Intel® Learn Program. The girls learnt about collaboration and critical thinking, and used Intel Learn as a platform to address the issue of hygiene. They used information from various sources: the Internet, the village survey, books, peer learners and the facilitators of the program.

Through their presentation, the girls encouraged the people in their village to visualise clean surroundings and understand the direct correlation it had with their good health. They talked about the existing conditions and the consequences they could all face if their surroundings were not cleaned up.

Impressed by their presentation, the Panchayat President instituted the *Gram Sudhar Samiti* (Village Development Committee), and invited the girls to become its members. Usually, members of the village committees were always men.

The girls continued to work relentlessly towards improving the hygiene and sanitation in their village. They motivated other committee members, and the entire community, to clean up their surroundings. They effectively used their technology-aided presentation and communication skills to convince people of the need for a cleaner village.

Today, the entire community is indeed very proud of its "little women" who successfully mobilised them to spruce up their surroundings.

Because of the tremendous success of this endeavour, the *Gram Sudhar Samiti* now plans to tackle other pressing developmental and community issues as well.

Shamira's Big Stride

Unfettered by physical limitations, a 13-year-old girl aims high

"Physically, I cannot keep pace with others, but I know I can succeed through my knowledge gained through Intel Learn."

Shamira

Working on a computer in a remote Akshaya Centre in Aricode, a remote village in Malappuram district of Kerala, Shamira's eyes sparkle as she flashes her Microsoft PowerPoint* presentation. Thirteen-year-old Shamira is one of the many children who are undergoing the Intel® Learn Program at the Akshaya Centre in this village.

Shamira cannot walk, but she is so motivated by her exposure to computer education, that she now aspires to become a doctor and serve her village. "The Intel Learn Program has motivated me to strive for better things", she says. In spite of her being physically challenged, she now dreams about a brighter future of herself and her community and has the confidence to fulfil it. "Physically, I cannot keep pace with others, but I know I can succeed through my knowledge gained through Intel Learn", says Shamira.

Launched in 2004 in select Akshaya Centres in Malappuram, this Private Public Partnership between Intel and the Kerala State IT Mission (KSITM) is aimed at students from neighbouring communities with limited access to technology. Learners in the age group of 8 to 16 develop crucial skills required in the 21st century—be they IT skills, problem solving abilities, how to work in a team, or connecting with real-life issues.

Ms Sumana Menon IAS, the former District Collector of Malappuram says appreciatively, "We are glad about the progress made in e-literacy in this district with Intel as a key stakeholder. Children are the most important wealth of the state and we are glad that, at this young age, they are able to realise their social responsibilities and contribute to community development."

Shamira is just one of the many compelling examples of how Intel Learn is expanding possibilities for young children across India, many of whom are first-generation computer users. She is now able to access information from across the globe and create powerful presentations as part of her projects. Most importantly, she can connect to real-life issues within her community and actively seek solutions. Shamira has been able to override her inhibitions and limitations, and has embarked on her future with confidence and hope.

Back to a Brighter Future

A teacher and her students get dropouts back to the classroom

"We found that the reasons for child labour were poverty and lack of awareness. We decided to initiate awareness in them. So we conducted a rally and conference. During the rally, students displayed placards and shouted anti-child-labour slogans."

Magdalene Premalatha
Teacher, Panchayat Union Middle School, Karakottai

In a small village in Tamil Nadu, a group of determined school children have achieved a small miracle: against considerable odds, they have successfully brought dropouts back into the school. These students, from the Panchayat Union Middle School in Karakottai, near Thanjavur, could achieve this rare feat through Intel-aided Project Based Learning.

Karakottai is an economically backward village, with most of its dwellers being daily wagers. Many of them are not disposed to sending their children to school, as each child is looked at as an extra hand that can fetch additional income for the family by working in the fields. It is only during the heavy monsoons that the school, quite literally, becomes an umbrella to their children, providing shelter to them.

But every dark cloud has a silver lining. Ms Magdalene Premalatha, who teaches at the Panchayat Union Middle school, is a firm believer in the right to education for all children. She was naturally dismayed at the school dropout rates among children in the 6-14 age group in the village.

Though her repeated attempts to bring the children back to school had not yielded any results, Magdalene did not throw in the towel. "It was my exposure to the Intel® Teach program, and the Project Based Learning methodology, that enabled me to address the problem of school dropouts more effectively," she said.

Equipped with new skills, she adopted innovative methods to engage her students and get them to take the initiative in creating awareness among the villagers about the disadvantages of child labour. They started by gathering information on the area-wise school dropout rates, and then conducted meetings of the Parent Teacher Association, where they educated parents on eradicating child labour. They also used street theatre to capture the interest of the public, who were touched by the drama and songs which depicted the condition, emotions and unfulfilled dreams of child labourers. They realised the importance of education, and the need to ensure basic education for all their children.

These efforts resulted in twelve students being enrolled again into the school. An NGO in the area came forward to sponsor the educational expenses of these students, and the entire village took an oath to eradicate child labour and to achieve 100% literacy in the village.

The village heads now have a mission: to ensure that all the dropouts enroll again into the school, where quality education will be provided to all children.

A Quiet Revolution

Toda girls view new horizons with technology

"I never imagined that the project would have such a huge impact upon the community. My intention was to involve the students using Project Based Learning and create an awareness on the social evil."

B Sharada Mani
Teacher, Panchayat Union Middle School, Odakkadu

The pastoral tribe of Todas leads an insular existence in the Nilgiri Hills in Tamil Nadu. As a result, child marriage is an accepted tradition in the tribe, which results in illiteracy and in the socio-economic backwardness of the community.

B Sharada Mani, a teacher in the Panchayat Union Middle School at Odakkadu in the Nilgiris, was drawn towards the plight of the Toda girls, and she was convinced that the only way out of this challenging situation was education.

Intel® Teach provided her with the tools and platform to make a difference in this situation. Using technology, her students engaged in research on illiteracy and child marriages. The Toda girls initially shied away from participating, but gradually warmed up and spoke about their concerns. The boys supported them as they wanted their community to progress.

The students shared the information they had collected through their research with their community members, and rallied relentlessly for the cause of education and against child marriage. An impressed community head said, "The students' effort against child marriage has paved the way for a better future for the community." One child marriage was actually stopped by angry protestors!

"When I started on this project, I didn't realise the huge impact it would have upon the community, my intention being only to create an awareness," says Sharada. Her Principal, too, applauded the Program saying, "The hidden skills, talents and strength of character of my students have been unearthed through engaging with technology."

A Stitch in Time

Students give new hope to residents of landslide-prone areas

"School, community and technology all joined hands to bring in a marked difference in the way we live. Intel's PBL method changed the way we look at solving some of the issues faced by the community."

Prasanta Kumar Panda
Teacher, Visakha Valley School
Visakhapatnam

The Venkojipalem and Rajiv Nagar localities, beside National Highway 5 (NH5) in Visakhapatnam, have always been under the risk of frequent landslides. In the last few years, the situation has worsened, with settlements springing up indiscriminately in the area due to cheap land prices. Continuous downpours and the expansion of NH5 have further weakened the soil.

This precarious situation caught the attention of a group of students from the nearby Visakha Valley School. They addressed the issue under the guidance of their geography teacher, Prasanta Kumar Panda, an enthusiastic proponent of technology-aided Project Based Learning (PBL). Three Class 10 students, Divyankita, Goutham and Pramod, researched online on measures that can reduce the extent of damage done by landslides. Then they launched an awareness campaign, highlighting the dangers of constructing houses in landslide-prone areas through creative skits.

The students advocated the use of plywood, instead of boulders, for the construction of houses, to minimise risk during a landslide. They encouraged the community to formulate a "landslide management plan", which included early evacuation at the first signs of danger; engaging in large scale tree-plantation; and constructing retaining walls to prevent further soil erosion.

The students also wrote a letter to the District Collector, the Mandal Revenue Officer and the District Education Officer, highlighting the dangers in this area and requested them to take appropriate steps. The local authorities responded promptly by identifying 21 endangered houses, some of which have been relocated to safer locations.

Residents of the area now proactively engage in other landslide management plans of the campaign, such as tree plantation, diversion of water channels, and construction of retaining walls, to create a safer community for themselves.

A Special Venture

A teacher turns entrepreneur and empowers special children

"I realised that the realm of technology does not limit itself to downloading information from the Internet. It also gives us a platform to upload our opinions, raise concerns over issues, and act towards improving those."

Lalitha Bilgi
Social Entrepreneur

At first glance, she is a determined lady with a focus. A Master Trainer (MT) trained under Intel® Teach, Lalitha Bilgi is now a successful social entrepreneur. She runs Swayam, a highly motivated parent support group based in Bangalore that works towards educating and empowering children with special abilities.

Swayam was born out of Lalitha's strong determination to work towards empowering differently abled children, after the birth of her son Kaushal, who has Down's Syndrome. So, after her training and successful stint as an MT, she decided to march towards the entrepreneurial world utilising her experiences as a teacher.

Swayam is engaged in a slew of activities with the aim of making learning fun for differently abled children. They are trained to use scanners to scan photos and signatures of the employees, which are then uploaded for online submission of Declaration of Forms to the Employees' State Insurance Corporation. They are currently engaged in doing this activity for a BPO based in Bangalore.

Lalitha's efforts were recognised when she won the second prize for her business plan for Swayam at the 2007 Management Program for Women Entrepreneurs at the Indian Institute for Management, Bangalore.

Lalitha feels that her exposure to Intel Teach provided her the impetus to be successful in her pursuit. "During those days as an MT, I realised that the realm of technology does not limit itself to downloading information from the Internet. It also gives us a platform to upload our opinions, raise concerns over issues, and act towards improving those. This led me into doing something for children with special needs, to empower them to stand firmly on their feet," says Lalitha, with a sparkle in her eyes.

With the information age replete with examples of women breaking the proverbial glass ceiling, Lalitha is an example of a new generation of social woman entrepreneurs. She was early in realising the potential of technology, and utilised it in a way that contributed to the empowerment of society. In her words, "Swayam has not only grown as an organisation, but has also helped individuals grow. And we still have more scope to grow."

The Greening of a Village

Environmentally aware children motivate farmers to take to natural farming

"It is the elders who usually are the torch bearers of knowledge, but, in this case, the students are carrying the message to the village elders."

Thiru Thangam Thennarasu
Education Minister, Tamil Nadu

Drawing inspiration from the Kenyan Nobel Prize winner and environmentalist, Ms Wangari Mathai and ably armed with technology, a group of school students from the Government Higher Secondary School in T Vadipatti, a remote village in Tamil Nadu, have brought about a remarkable change in the local agricultural community.

The farmers in T Vadipatti, an agricultural hamlet in Madurai district, were basking in the glory of their bumper harvests, but they were dangerously unconcerned about the depletion of soil fertility.

The students, aware of this issue, were determined to encourage soil conservation. Fourteen year old Jayaprakash and his classmates decided to educate the farmers on soil conservation, and on the use of natural farming techniques, like using bio-fertilizers and vermiculture. Under the guidance of their teacher, Ramesh Kannan, who had been trained under the Intel® Teach Program, they used technology-aided tools.

The students made trips to centres practising natural farming, and they communicated its benefits—through street plays, and planting saplings—to the community. The students also addressed farmers at the Periyar-Vaigai Irrigation Farmers training camp, and encouraged them to use organic manure. These farmers are now using bio-fertilizers and vermiculture in portions of their land for cultivation.

A proud Ramesh says, "When I took up this particular project, my aim was to support the pillar of our economy—agriculture. We have the potential to come up with innovative ideas to tackle practices that lead to the depletion of soil fertility. Intel helped me to think beyond the four walls of my classroom in dealing with the critical issues facing our community."

T Vadipatti has now become a model village, showing the way to the rest of Tamil Nadu on how the adoption of natural farming methods can lead to sustainable development through soil conservation.

Young Jayaprakash and his friends have truly greened the lives of the people of T VadipOatti.

A Balancing Act

Students show that low budgets are no barrier to a nutritious diet

"Education fails to secure its objectives if students are unable to apply their knowledge in their day to day life"

Sharmistha Bhattacharya
Teacher, Ananda Ashram Ballika Vidyapeeth, Kolkata

Tukai and Swati, students of Ananda Ashram Balika Vidyapeeth, a government school in Kolkata, come from underserved families where there was always a paucity of food. The quality of food was never important as long as there was something to fill their stomachs.

A project on nutrition given to them by their teacher, who had been trained under the Intel® Teach Program, however, changed all that.

As part of the project, they were given the caloric values of certain food items and asked to check whether their family members were getting a balanced diet. They went online and calculated how many calories their family members would need, given the kind of work that they did, and compared that to their daily food intake. Their research revealed that many of their mothers were suffering from malnutrition.

These students then took their research further. They looked for alternative foods in their diets, which would give them the same , if not higher, caloric values at the same cost. Two weeks later, the girls were ready with diet charts for their families. They chose smaller and less expensive fish than what was currently consumed, but which was at par in nutritive value. With the money saved, they could include shrimps and small crabs, very rich in calories, proteins, fats and minerals. So, for the same amount of money, they could now eat fish, shrimp or crab four days a week. They also included green vegetables, soya beans and mushrooms in their menu. Instead of eating red meat once or twice a month, they decided to have an egg or a banana for breakfast, every day.

Tukai and Swati then printed these diet charts and gave them to their teachers to be used by other families as well. Impressed by their efforts, the teachers decided to showcase the efforts of these girls to all the students in the school and their parents. The girls acted as dieticians and gave options on how to plan a low cost meal with higher nutritive value for a balanced diet.

After two months, the students followed-up on their project and repeated their exercise of finding out individual caloric intakes. To their joy, they found that the food value of the diet of all the families in the project had gone up considerably, with the intake of vitamins and minerals increasing by almost 36%.

These girls has made a remarkable difference that would impact the lives of not just their families and peers, but of future generations as well.

A Shining Example

Determined teachers and their students clean up Chennai neighbourhood

"Today, our Ashok Nagar is one of the cleanest and healthiest places in Chennai, with few people and children falling ill. And we will do our best to keep it that way."

Latha
A resident of Ashok Nagar

After Gopitha and Shanthi, teachers from the Government Girls Higher Secondary School, Ashok Nagar, Chennai, had trained under the Intel® Teach Program, they decided to tackle a serious issue facing most of their students. Most of them came from economically backward families, where cleanliness and hygiene were not a priority, and they were easy prey to diseases like dengue, typhoid and malaria.

The teachers divided their students into groups that explored the effects of living in unhygienic surroundings. The students discovered that recurring diseases, like common cold, cough, allergies and gastroenteritis, were a result of their unhygienic surroundings. Simple steps like washing their hands, keeping their food covered, keeping their bodies clean, and not throwing garbage around their houses would go a long way in making them healthy and immune. They went a step further, and used the Internet for information on how to maintain the cleanliness in their surroundings.

Armed with this information, the students enthusiastically started a "Cleanliness Campaign", starting with their school. They made posters on the computer about the dangers of unclean surroundings, and put them up in the vicinity of their school. Once the posters had created a buzz, a team of students invited parents, on the Parent Teacher Day, to view a presentation on the need for cleanliness. Their presentation showed how people, especially children, were susceptible to all kinds of epidemics, and highlighted the long term effects of being raised in unclean surroundings.

The elders in the community were very appreciative of their work and decided to hold a special meeting to discuss the issue. The community members agreed to make some simple, but important, changes in their habits. Women decided to keep little boxes outside their houses to put their garbage in, rather than throwing it on the street. Parents promised to get their children to wash their hands regularly to protect them from innumerable diseases, and to keep food covered so as to prevent flies from proliferating in the area.

Today, Ashok Nagar is one of the cleanest and healthiest communities in Chennai, due to the efforts of two motivated teachers and their band of determined students.

Saving Money Saves Lives

School students in Vinchhiya get a healthy new addiction

"Along with money, students and villagers have learned to save lives also."

Dipika Patel
Teacher, Anupam Prathmik Shala, Fatehpur, Gujarat

The small village of Vinchhiya, in interior Gujarat, faced a grim situation: more than 75% of children of the 450 families there were victims of a potentially fatal addiction to *gutka* (a type of chewing tobacco).

The children needed not just to be sensitised to this issue, but also given a new direction. The teachers of the local school, trained under the Intel® Teach Program, started a project to combat the harmful practice of tobacco addiction. They decided to open a bank in the school and teach the students the benefits of saving the money they were wasting on *gutka*. They shared this idea with the Sarpanch of the village, and there was a consensus on setting up a "Vinchhiya Children's Savings Bank."

The teachers then invited the parents to school and showed them a presentation on the effects of addiction to harmful substances. They discussed with them the idea of having the bank in the school for the children. The money that the students deposited could be withdrawn at any time for study material, games, co-curricular activities, or any other genuine need. The teachers then took the students to the Kalupur Bank, Sanand, where the bank manager told them how banks operated.

The students reacted very positively and organised a rally to spread awareness on the ill effects of tobacco addiction in the local community. The teachers organised the savings bank in the school, appointed students as cashiers, managers and clerks, and nominated a coordinator. Just as in a real bank, the students were taught to create bank accounts on the computer, using spreadsheets, and issue passbooks and cheque books to the account holders. They used word processing applications to create the passbooks.

Soon, there was a drastic change in some of the students: their minds had something else to focus on. They realised the power of savings and utilised it to buy useful things they needed for school.

Today, their little bank has flourished and the funds collected are growing steadily. The students are now working collectively towards making their own future brighter.

A Thirst for Change

School kids teach Assam villagers a valuable lesson on the judicious use of water

"I am very proud of what my students have acheived, which they did because of technology."

Ranjan Chutia
Teacher, Nakachari Higher Secondary School, Jorhat

Every day, Ranjan Chutia, a teacher at the Nakachari Higher Secondary School in Jorhat, would see contrasting scenes in the villages he passed on his way to school: in some villages, people would fight over scarce water, while in others there were open taps with no takers!

Trained under Intel® Teach Program, Ranjan Chutia was aware of the power and reach of technology. He embarked on a project with his students of Class 8 on water conservation, whereby they could spread awareness and also bring about some desirable changes in people's habits.

His enthusiastic students worked in teams towards developing a comprehensive understanding of the issue, with the help of information technology. They visited the nearby Community Information Centre to use the Internet for research. While some of them made banners on the conservation of water, others worked to prevent the wastage of water. Working innovatively, they sought out similar problems in other villages and learnt from the solutions that had been developed.

With the help of their school principal, they set up a meeting with the social leaders of Tirual and Deberapara Chariali, the villages selected for the campaign. They also met the Engineer of the Public Health Department of Jorhat district, apprised the officials of the problems the villagers faced, and asked for solutions.

The students then made presentations to the villagers on the importance of water conservation, supported by printouts of relevant data and banners. The students' efforts made the Panchayat and the people realise their apathy in dealing with the problem, and they approached the officials of the Public Health Department for an automatic tap.

The students' efforts had achieved the desired results. The people of Deberapara Chariali now get the required amount of water, and in Tirual no water is wasted.

This project was selected to represent their school at the Assam Children Science Congress, and was also presented at the All India Children Science Project Competition.

Technology has helped in meeting the immediate needs of the people, as well as conserving one of our most precious resources: water.

Reaching for the Stars

A passion for mathematics opens new vistas for this bright young spark

"My teammate and I wanted to find a method where anyone could easily find the nth root of any number. We were determined to succeed in our endeavour, and, finally, we did it."

Amar Deep

The chain of Jawahar Navodaya Vidyalas (JNVs) across India, set up by the Navodaya Vidyalaya Samiti under the Ministry of Human Resources Development, Government of India, aims to provide good quality, modern education to children from rural areas. Students from JNVs have been enthiusiastic participants at the science fairs organised under the Initiative for Research and Innovation in Science (IRIS), and its precursor, the Intel Science Talent Discovery Fair, since 1999.

Amar Deep, then a student at the Jawahar Navodaya Vidyala in Meerut, Uttar Pradesh, was a winner at the IRIS National Fair in 2005, and represented India at the Intel Intenational Science and Engineering Fair (Intel ISEF) held in Indianapolis in 2006.

He had limited access to state-of-the-art technology at his school, but that did not deter Amar from being a winner. "Maths is in my blood", says this 18-year-old. His father, a Maths teacher, had a big role in nurturing his interest in the subject, and ultimately motivated Amar to develop his award winning project.
Together with his teammate, Vakeel Ahmed, he presented a unique way to find out the 3rd root, 4th root, 5th root, and so on, of any number, through a unique, simple, and accurate method. Normally one has to refer a log table and use differential calculus to find out the *n*th root; however this process is cumbersome and difficult. "My teammate and I wanted to find a method where anyone could easily find the *n*th root of any number. We were determined to succeed in our endeavour, and, finally, we did it."

Life was never the same for Amar after he returned from the United States—he had new dreams and great hopes. His interaction with Nobel laureates and fellow participants from different countries motivated him to aim higher.

Though Amar is still in college completing his advanced computer hardware and networking course, he is already engaged in "Space Elevator", his new and novel project. Though lack of funds and high speed Internet connectivity are slowing down his research, he is confident of completing his project in the next two years.

After his participation at Intel ISEF 2006, Amar Deep was also awarded the *Bal Vigyanic Samman* from the Department of Science and Technology, Goverment of Uttar Pradesh.

The Colours of Success

Two socially conscious school girls address a health hazard

"If you desire intensely and you act upon it, then everything is within your reach."

Riddhi Dasani & Pooja Dholakiya

Winning at national science fairs is no longer restricted to students from the metros in India. At the last National Fair 2007, six of the eights students who were selected to represent India at the Intel International Science and Engineering Fair (Intel ISEF), held in Atlanta in May 2008, were from smaller towns and cities. Riddhi Dasani and Pooja Dholakiya, Class 9 students at the Late Shree S G Dholakiya Memorial High School in Rajkot, were two of them.

The idea for their award winning project came after they saw some young students in their school licking the ink from sketch pens. They realised the dangers of children taking in toxic colours and they decided to do something to make child safe inks. After six months of patient experimentation, Pooja and Riddhi were successful in deriving inks from fruits and vegetables. The ingredients for their project were simple: turmeric (for yellow), red chilly (for red), and roses (for pink), to name a few.

Travelling to America was something they had never even imagined they would do. The trip to Intel ISEF 2008 was, in fact, their first outside their home town. They came back richer, not just from the experience, but as Third Prize winners in Plant Science in the Team Projects category, bagging a cash prize of USD 1,000.

With limited exposure to the fast growing pace of science and technology prior to their trip to Atlanta, Riddhi and Pooja were thrilled by the opportunity, They say: "Participating in Intel ISEF was a great chance for us to know new things related to science." Even more than the prize they won, they consider it a great honour to have represented their country at an international forum!

On their return from Intel ISEF, they were felicitated by the Hon'ble Union Minister of Science and Technology, Mr Kapil Sibal, in New Delhi. Later, at a special event, the Hon'ble Chief Minister of Gujarat, Mr Narendra Modi, also applauded them.

Impressed by their achievements, their school has sent their inks to laboratories of Saurashtra University, M S University, Baroda, the Gujarat State Food and Drug Control Department and others, and the analytical reports have been very encouraging.

Both the girls consider former President of India, Dr A P J Abdul Kalam, as their idol, and his words have been their constant inspiration. Their own path to success is a great inspiration to all the students in their school.

A Passion for Research

The first Indian winner at Intel ISEF continues to pursue her scientific quest

"Intel ISEF has broadened my spectrum and given me the much needed perspective and confidence... it offered me focus... and, therefore, a thorough edge over other starry-eyed 16 year olds."

Madhurima Benakareddy

As a student at the St Augustine School in Anantapur, Andhra Pradesh, Madhurima Benakareddy was an enthusiastic participant at the Intel International Science and Engineering Fair (Intel ISEF) in 1999.

Her project on *Insecticides and Anti-feedants from Custard Apple Seeds*, explored how biological pesticides were effective in controlling pests that were resistant to chemical pesticides. Her research won her the Grand Award in Bio-Chemistry that year, making her the first ever Indian winner at the prestigious forum.

Eight years down the line, Madhurima continues to indulge in her passion for research and science. She is currently associated with the Tata Institute of Fundamental Research (TIFR), Mumbai, as a Research Scholar, and is pursuing her Ph D in *Animal Models of Depression*.

Intel ISEF put her on the shining path of success, and, a year later, she was invited to participate at the *World Wide Young Researchers for Environment*, a forum for young environmental researchers, in Hanover, Germany.

Encouraged by the exposure and recognition, Madhurima was prepared for greater challenges in science, and completed her B Sc from Osmania University.

She lists the advantages that exposure at Intel ISEF provided her: "Experience and soft skills. It taught me the art of effective communication and making tough, yet good, choices."

With her feet firmly planted on the ground and eyes turned towards the skies, Madhurima Benkareddy is sure to achieve even greater heights in the future.

An Enriching Experience

A young engineer innovates for the visually impaired

"The Intel Scholar Program needs no explanation to an engineer aspiring for research. It is a platform that provides excellent opportunities not only to exhibit one's talent, but also to hone one's skill sets."

Nandish Mehta

Choosing engineering as a career was a natural choice for Nandish Mehta, as his father was an entrepreneur and engineer. After his undergraduate studies, Nandish worked in a few organisations in Ahmedabad and Mumbai, before he took up a position at the Indian Space Research Organisation's Satellite Application Centre at Bangalore. After working there for a year, he decided to pursue higher studies, and joined the PhD program at the Indian Institute of Science, Bangalore, in 2007.

It was here that he was introduced to the Intel® Scholar Program (ISP). He decided to participate as he was convinced that it was a systematic and well architected event. His project proposal was about medical implants for the visually impaired, and the limit of 10 pages for his proposal submission helped him strike a balance between *research* and *development*. The biggest challenge for Nandish was to grab the attention of the judges —many of whom were technocrats from Intel.

Having qualified for the semifinals, he was asked to prepare posters explaining his plans, his approach and a description of his solution. As his project was an effort towards technological development in neural science, he felt that he needed to explain his innovation and ideas with minimal jargon. His mentor at Intel taught him how to put "first things first", and how to progressively show the importance and novelty of his idea.

Nandish feels that participating in the ISP was an enriching experience for him, as he got the opportunity to network with other participants, and see other students' projects. This initiated a cross-pollination of ideas. He applauds the ISP initiative, which motivates students like him to aim high for success in their careers.

A Passion Renewed

Intel contest helps a student refocus on a career in research

""This particular event has opened my eyes to a whole new world of research of which I had only dreamt so far. It has propelled me to take up research as a serious career option."

Nikhil Rao

A student of electronics and communication at the P E S Institute of Technology, Bangalore, Nikhil Rao is currently in the final year of his Bachelor's degree, and has plans of pursuing his Masters in Microelectronics, and a PhD in the same field.

Nikhil had always wanted to become a scientist and engage in research, but his previous attempts came to nought because of lack of support and guidance. All that changed early in 2008 when a poster on his college notice board asking for research proposals caught his attention. He started work on a research project under the Intel Scholar Program (ISP) 2008, along with a classmate.

Participation in ISP 2008 had a tremendous impact upon him—both academically and personally. By working on the research project, he has, by his own admission, now learnt to multitask, and manages his time efficiently between his studies and research. He is also now able to look at engineering in a more practical way. He has been greatly influenced by his mentors at Intel, who, despite their busy schedules, spent a lot of time in guiding him, and he has learnt about engineering ethics from them.

"By participating in the ISP, I learnt the technique of efficient planning and executing plans to near perfection. I also learnt how to prioritise different tasks based on their complexities."

The ISP experience opened his eyes to a whole new world of research, and has encouraged him to take up research as a serious career option.

Expanding Horizons

Talented student gets motivated as she explores uncharted territories

"This program has taken me beyond the classroom, has instilled confidence in me by accepting my idea and has shown me the joys of research work."

Kruchi Hazra

A computer science and engineering student from the National Institute of Technology, Durgapur, Kruchi Hazra was encouraged by her parents to explore her mathematical bent of mind. A topper in her class, she paid particular attention to building her skills in computer science, a subject she was very interested in. Once she became a student of engineering, she realised that innovating and applying her skills to real world problems was an integral part of her engineering education. Today, she is inclined towards a career based on research, a decision that has been strengthened by her success in the Intel® Scholar Program (ISP).

It was in May 2008 that a friend of hers informed her of a brilliant opportunity for her undergraduate thesis project to be guided and showcased: the ISP. She immediately started looking for a suitable proposal to be submitted for the contest. She was always interested in the emerging field of parallel computation and started reading up more on the technical breakthroughs in the area, until she homed in on the topic she wanted to explore. She teamed up with a classmate and they went ahead with their proposal.

The acceptance of their proposal was quite a pleasant surprise for them. They now had the task of gearing up for the poster presentation, the next round of the contest. It was the first technical presentation that Kruchi was involved in, and her teammate and she put in a lot of effort to get it right. Currently, they have a good chance as they have qualified for the finals of ISP 2008, to be held in early 2009.

Kruchi feels this experience has taken her beyond the classroom and has introduced her to parallel algorithms and high performance computation, a subject of immense interest to her, even though it is not offered yet as a course in her University. The program instilled great confidence in her, she says, when the idea submitted by her in her proposal was accepted, and it has shown her the joys of research.

She has found her association with Intel engineers and technologists, and the national platform given to her to build a project from inception to completion, to be particularly enriching experiences.

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