



Zeal Education Trust Ahmedabad, Gujarat



Zeal Education
Ignite the genius in your child



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2. Executive Summary

Particulars	Description
Project Goal	The project's goal is to introduce students to Science, Technology, Engineering and Maths through a series of explorations. Explorations start with a question, go through experiments and searches and end in the design and making of a model.
Project Objectives	• 2000 students' enthusiasm and capabilities in STEM subjects improve significantly • 20 teachers find teaching STEM subjects fascinating through a completely new approach
Rationale	The problems that we face today require a holistic approach to education, wherein the links between themes like Science, Technology, Engineering and Maths need to be emphasised in school. Students need to learn not solutions to problems, but how to engage in the process of finding solutions. Today's problems are so complex that it is not possible for a single person to even comprehend them in their entirety: working in groups, learning to communicate and collaborate with others has become even more important today than it was in the past. The easy availability of information through the internet and AI has made the appropriate use of technology even more important today than ever before. These ideas are as applicable to India's huge rural and underexposed population as to the privileged children of the major cities.
Target Beneficiaries	Students and teachers of targeted location.
Linkages with SDG's	• Quality Education (SDG 4) through improved access to high-quality educational resources. • Reduced Inequalities (SDG 10) by promoting inclusivity and equitable access to education. • Partnership for the Goals (SDG 17) through collaborations with educational institutions, governments, and corporations.
Geography	The proposed project will be implemented in 20 schools in a specific location (to be selected in consultation with the donor).
Concept	The project aims to engage students of class 6-8 in 15 different explorations in STEM subjects. Each exploration has been carefully chosen to introduce students to fundamental ideas in science and maths, involve them actively in designing, making and learning how to use models and learn to communicate the process to their peers.
Expected Outcome	A significant number of students join Science mainstream and perform superlatively, motivated by the program and its insights.

Project Duration	5 years
Project Budget	Rs. 1,82,70,000

3. Background

School education in the past has been characterized by several features, which are inappropriate for the present day and for the future:

- Subjects are taught in isolation, with no connections established even between different subjects in science like Biology and Physics or in maths like geometry and trigonometry.
- Students learn laws, derivations and theories rather than learning to discover laws, derive results and formulate theories.
- When students perform an experiment, they are told exactly what to do, becoming glorified clerks in the process. When asked to participate in a science exhibition, most students (or their parents) will copy a model that is described in a video on YouTube, without any understanding of the design process.
- Students are rarely encouraged to work in groups. The idea that a group of students would take up a problem, discuss possible solutions amongst themselves and with a guide and design the solution is foreign to our education system.
- The use of technology is often limited to showing videos of experiments, saving the school the expense of buying equipment and the teacher the trouble of performing the experiment! The student is reduced to a passive observer rather than an active participant of the learning process.



4. Rationale of the project

Today's problems are very different from those of the past. While it was possible for an Euler or a Gauss, an Einstein or a Pauling to contribute to many fields in their subject, the amount of knowledge and nature of problems makes it difficult for a single person to even comprehend them. We need to change our education system, making it more collaborative, encouraging students to communicate with each other and to become active participants in the learning process. Students need to learn to think like a scientist, a mathematician, an engineer or a technologist, not just learn the end products of these subjects!

We at Zeal firmly believe in the process approach to education. We believe that the main distinction between (say) a physicist and a lawyer is, in addition to domain knowledge, the way they think. Just knowing Newton's laws or the Constitution does not make a person a physicist or a lawyer: the main difference is in the kind of questions that each one asks. Given this, what is the best way to teach children in school? We believe it lies in making students undergo guided explorations, where they learn to ask questions and answer them like a scientist or mathematician or engineer, going through the process and ending up becoming one! No amount of lecturing about the Scientific method will succeed as well as an hour of putting it into practice!

5. Profile of Zeal Education Trust

Zeal Education Trust was set up in January 2016 by **Dr. B R Sitaram** and **Ms. Sandhya Sitaram** to provide specific educational services to underprivileged schools through CSR programs sponsored by the corporates and other organizations. The main goal of the trust is to involve corporates in igniting the minds of students of the underprivileged section of the society so that they also get opportunities to get into mainstream professions.

Zeal Educational Trust, organisation, Zeal Ltd. have been involved extremely popular program Exploring Science. This series of 90 minute sessions, separate question in science



targeted at various age groups and each session involved intense discussions and explorations, culminating in one of the students writing a report about the session. The report in turn was presented to the group, and edited as per the group's recommendations.

The same organisation also conducted several model making programs, wherein students were trained in making innovative models in science and mathematics. Once again in these sessions, a lot of stress was laid on design and choice of materials.

We were also pioneers in the use of IT in education, with our first programs dating to 1987. Over the years, hundreds of students learnt to use technology to assist them in their learning.

Our experience with these programs and our long interaction with students of all ages and types, including rural and underprivileged students, have enabled us to design this program appropriately.

through its sister Educational Services Pvt. since 2002 in running an called The Young Scientist program consisted of a each devoted to exploring a or maths. The program was

6. Proposed Project Activities

This intervention is focused at **20 schools** taken as a cohort. The program will be spread over 5 years.

Year 1:

Preliminary:

The District Education Authorities will be contacted and the program explained to them. With their assistance, a list of 20 schools in the same area will be identified. Suitable letters of permission will be obtained from them and a suitable school for the workshops will be identified. The principal of each of the selected schools will be contacted and requested to assist in the implementation of the program. Each school will be asked to depute 1 teacher (science or maths) for the project.



Through Year

Through the year, 3 workshops of 3 days duration each will be arranged. These workshops will be arranged in conjunction with the District Education Authorities and will be attended by all the selected 20 teachers. During each workshop, 5 explorations suitable for class 6 will be introduced to the teachers, who will act as students and work through the explorations under our guidance. All the necessary materials will be provided by Zeal. **In the first year,**

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all targeted students (class 6, 7 and 8) will be performing the same explorations. Following each workshop, the following material will be provided to each school:

- 45 copies of the student kits for each of the 5 explorations of class 6, to be used by students of class 6, 7 and 8 (same kits to be used by all students)
- 15 copies of the permanent models for each of the 5 explorations of class 6, to be used by students of class 6, 7 and 8 (same kits to be used by all students)
- A set of tools (scales, protractors, paper cutters, paper punches, etc.) that would be required for performing the explorations.

During the year, students will go through the explorations and arrange an exhibition at the end of the year wherein they will showcase their understanding and experiences throughout the year.

A special exhibition will be arranged in a central location where all schools will be asked to send teams to exhibit their work. This exhibition will be attended by education officials and other officers.

Year 2:

Preliminary:

The District Education Authorities will be contacted for finalizing dates and location for the workshops and the same will be communicated with principals.



Through Year

Through the year, 3 workshops of 4 days duration each will be arranged. During each workshop, 5 explorations suitable for class 7 will be introduced to the teachers, who will act as students and work through the explorations under our guidance. All the necessary materials will be provided by Zeal. **In this year, all students of class 7 and 8 will be performing the same newly introduced explorations, while students of class 6 will be performing the**

explorations introduced in Year 1. One day of each workshop will be used to review the work done in the previous year and to identify any replacements/repairs needed for older material. Following each workshop, the following material will be provided to each school:

- 15 copies of the student kits for each of the 5 explorations of class 6 to be used by students of class 6 and 30 copies of the explorations of class 7 to be used by students of class 7 and 8
- 15 copies of the permanent models for each of the 5 explorations of class 7, to be used by students of class 7 and 8. Students of class 6 will use the models already used in the previous year.
- Any replacements/repairs that are needed to be done to the permanent models and tools provided in year 1.

During the year, students will go through the explorations and arrange an exhibition at the end of the year wherein they will showcase their understanding and experiences throughout the year.

A special exhibition will be arranged as in Year 1.

Year 3:

Preliminary:

The District Education Authorities will be contacted for finalizing dates and location for the workshops and the same will be communicated with principals.

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Through Year

Through the year, 3 workshops of 4 days duration each will be arranged. During each workshop, 5 explorations suitable for class 8 will be introduced to the teachers, who will act as students and work through the explorations under our guidance. All the necessary materials will be provided by Zeal. **In this year, all students will be performing the explorations of their classes.** One day of each workshop will be used to review the work done in the previous year and to identify any replacements/repairs needed for older material. Following each workshop, the following material will be provided to each school:

- 15 copies of the student kits for each of the 5 explorations of each class (45 in all)
- 15 copies of the permanent models for each of the 5 explorations of class 8, to be used by students of class 8. Students of class 6 and 7 will use the models already used in the previous year.
- Any replacements/repairs that are needed to be done to the permanent models and tools provided in previous years.

During the year, students will go through the explorations and arrange an exhibition at the end of the year wherein they will showcase their understanding and experiences throughout the year.

A special exhibition will be arranged as in Year 1.

Year 4 & 5:

The District Education Authorities will be contacted for finalizing dates and location for the workshops and the same will be communicated with principals.

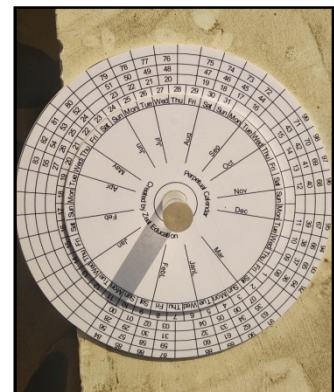
Through Year

Through the year, 3 workshops of 1 day duration each will be arranged. During each workshop, we will review the work done in the previous year and identify any replacements/repairs needed for older material. Following each workshop, the following material will be provided to each school:

- 15 copies of the student kits for each of the 5 explorations of each class (45 in all)
- Any replacements/repairs that are needed to be done to the permanent models and tools provided in previous years.

During the year, students will go through the explorations and arrange an exhibition at the end of the year wherein they will showcase their understanding and experiences throughout the year.

A special exhibition will be arranged as in Year 1.



7. Kit Contents

Student Kits

- All the materials required to perform the explorations, normally made of card/cardboard
- Worksheets to be filled by students

Permanent Kits

- All common materials to be used by students in groups, normally made of

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acrylic/wood/metal. These are meant to be used over and over again by different groups of students.

- Teachers' notes and keys to worksheets.

Tool kits

- Common tools used in making models, e.g. protractors, scales, paper punches, compasses and clips

8. Monitoring & Documentation

Project Monitoring

The program is monitored during the workshop through **observations** and **teacher feedback**. Once the teachers start the school program, a constant monitoring of activities through **videos** and **images** will be sent on the WhatsApp group. In case teachers do not appear to be active, they are contacted and asked to resume activities. In this scenario, interactions will be held with principals. Finally, the school exhibitions give a first-rate opportunity to find out exactly how students have understood and absorbed. This helps gauge the **interest and enthusiasm** shown by teachers and students alike

Documentation

Recordings and notes would be prepared

- Report after each workshop is completed
- Report after the exhibitions are conducted
- Images and videos of the workshops, activities in the school after the workshop and of the exhibitions
- Feedback by the teachers and the students
- Case studies of the students in terms of how the intervention helped them and best practice models



9. Project Visibility

- A Banner will be designed bearing the name and logo of the corporate, along with the name and logo of Zeal Education Trust
- The banner would be displayed during the workshops
- One copy of the banner will be given to each school. The teachers will display the banner when they work with the students when they train them
- The banner will be displayed during the exhibitions
- The boxes of material supplied to the schools will bear the same poster in the form of a sticker

10. Project Outcome

The success of this intervention lies mainly in terms of the change the program brought in their lives, let alone in the classes, months and years after the program got over. Students

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claimed that they decided to pursue a career in science thanks to our programs. Besides, due to the keen interest in Science and Mathematics, a significant reduction of dropout and more children getting fascinated by these subjects are found. There are some pointers to the effect of the program which can be (and have been) observed during interactions.

Pedagogical techniques of facilitating learning: During the program, teachers were made to go through techniques like the process approach and the Socratic methods of learning by questioning. Teachers realized and gained the belief that such methods could be actually put into practice with their students. This is seen through the effect of teachers using the approaches in interactions with students.

The teachers learn new skills like measuring accurately, cutting, pasting, understanding plans, etc. They grow in confidence with every model they made and become sure that they could make models by themselves

11. Budget Summary

Year	Type	Amount
1	Activity	48,50,000
	Personnel	2,40,000
	Total	50,90,000
2	Activity	36,85,000
	Personnel	2,40,000
	Total	39,25,000
3	Activity	38,35,000
	Personnel	2,40,000
	Total	40,75,000
4	Activity	23,50,000
	Personnel	2,40,000
	Total	25,90,000
5	Activity	23,50,000
	Personnel	2,40,000
	Total	25,90,000
	Grand Total	1,82,70,000

12. Budget Detailed

A	Activity Cost		Total
	Year 1		
1	Approval Meetings	1 meeting	25,000
2	Student Kits	45 kits x 1500 per kit x 20 schools	13,50,000
3	Class kits for Workshop and Schools	5 x 15 kits @ 1000 per kit x 20 schools	15,00,000
4	Tools	45 sets @ 1000 per set x 20 schools	15,00,000
5	Workshop expenses (travel, resource persons, food)	9 days workshop, 3 resource persons, food for 25 persons	3,00,000
6	Final Exhibition		1,00,000
7	Monitoring		75,000
	Total for Year 1		48,50,000
	Year 2		

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1	Approval Meetings	1 meeting	25,000
2	Student Kits	45 kits x 1500 per kit x 20 schools	13,50,000
3	Class kits	5 x 15 kits @ 1000 per kit x 20 schools	15,00,000
4	Maintenance for kits and tools	10% of value	3,00,000
5	Workshop expenses (travel, resource persons, food)	16 days workshop, 3 resource persons, food for 25 persons	3,35,000
6	Final Exhibition		1,00,000
7	Monitoring		75,000
	Total for Year 2		36,85,000
	Year 3		
1	Approval Meetings	1 meeting	25,000
2	Student Kits	45 kits x 1500 per kit x 20 schools	13,50,000
3	Class kits	5 x 15 kits @ 1000 per kit x 20 schools	15,00,000
4	Maintenance for kits and tools	10% of value	4,50,000
5	Workshop expenses (travel, resource persons, food)	16 days workshop, 3 resource persons, food for 25 persons	3,35,000
6	Final Exhibition		1,00,000
7	Monitoring		75,000
	Total for Year 3		38,35,000
	Year 4		
1	Approval Meetings	1 meeting	25,000
2	Student Kits	45 kits x 1500 per kit x 20 schools	13,50,000
3	Class kits	5 x 15 kits @ 1000 per kit x 20 schools	NIL
4	Maintenance for kits and tools	10% of value	6,00,000
5	Workshop expenses (travel, resource persons, food)	3 days workshop, 3 resource persons, food for 25 persons	2,00,000
6	Final Exhibition		1,00,000
7	Monitoring		75,000
	Total for Year 4		23,50,000
	Year 5		
1	Approval Meetings	1 meeting	25,000
2	Student Kits for Workshop and Schools	45 kits x 1500 per kit x 20 schools	13,50,000
3	Class kits for Workshop and Schools	5 x 15 kits @ 1000 per kit x 20 schools	NIL
4	Maintenance for kits and tools	10% of value	6,00,000
5	Workshop expenses (travel, resource persons, food)	3 days workshop, 3 resource persons, food for 25 persons	2,00,000
6	Final Exhibition		1,00,000
7	Monitoring		75,000
	Total for Year 5		23,50,000
	Total Activity Cost		1,70,70,000
B	Human Resources		
1	Project In Charge	60 months x 20,000 per month	12,00,000
	Total Human Resources		12,00,000
C	Grand Total		1,82,70,000

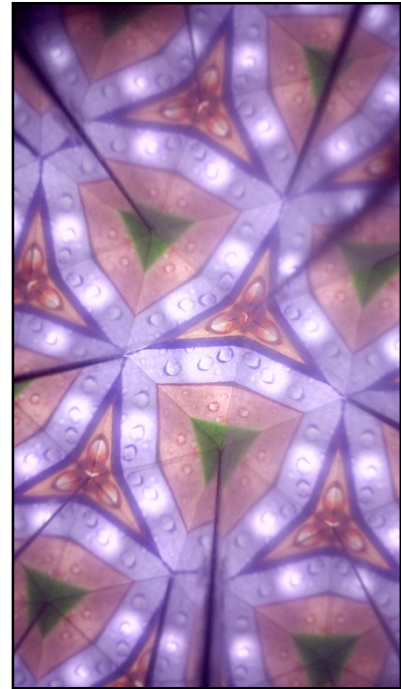
13. Sample Explorations

Class 6

- Exploring Animation
- Exploring Colour Mixing
- Exploring Calendar Patterns
- Exploring Algebra with tiles
- Exploring Characteristics of living creatures

Class 7

- Exploring Searching techniques
- Exploring Constellations
- Exploring simple electrical circuits
- Exploring image formation in a lens
- Exploring graphs: Unicursal curves



Class 8

- Exploring how a sundial works
- Exploring Map Making
- Exploring Error Detecting and Correcting Codes
- Exploring Equilibrium
- Exploring different number bases

