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CHOTE KALAM SCIENTIFIC EXPLORATION PROGRAM FOR MIDDLE SCHOOL STUDENTS

QUARTERLY REPORT

PERIOD

JUL - SEP 2024

REPORT BY

VIDYODAY MUKTANGAN PARIVAR FOUNDATION

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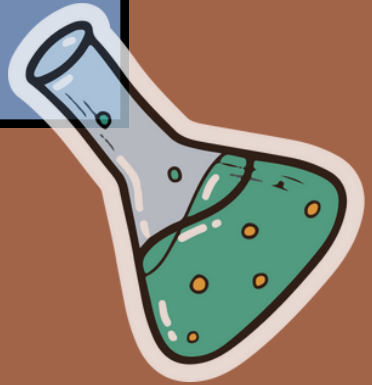
CONTENT



SUMMARY SHEET

Project Details

Project Title	Enhancing STEM Education Through Project-Based Learning
Project Period	April 2024 to March 2025
Reporting Period (3 Months)	1 July, 2024 - 31 September, 2024
Project Location	State of Maharashtra, Districts Kolhapur (Shirol Block). • 5 Primary schools in the Rural area of Kolhapur district 1. Kendriya Vidya Mandir, Abdullat 2. Kanya Vidya Mandir, Abdullat 3. Kumar Vidya Mandir, Shiradwad 4. Knaya Vidya Mandir, Shiradwad 5. Kendriya Vidya Mandir, Latwadi
Project Goal	Empower students and educators by using project-based learning (PBL) to foster critical STEM skills, inspire future scientists, and promote hands-on, real-world applications of science, technology, engineering, and mathematics.
Project Beneficiary	Children and teachers from the 5 government schools of rural villages in Shirol Block, Kolhapur.
Collaborators	Gram Urja Foundation (Beed), Rotary club of Ichalkaranji, Innerwheel Club (Ichalkaranji)
CSR Donor	1. Wipro Foundation, 2.Unltd India, 3.IFM Electric Pvt. Ltd., 4. Nano Mag Tech Pvt. Ltd.

EXECUTIVE SUMMARY

The Chhote Kalam Science Project, designed to improve STEM education in government schools in Kolhapur, focuses on addressing the critical gaps in science comprehension, as revealed by national surveys showing a 38.29% understanding rate. The project aims to enhance student engagement and learning outcomes by introducing hands-on, inquiry-based learning through Project-Based Learning (PBL) techniques, particularly targeting students from low-income backgrounds. The primary objective is to foster critical thinking, problem-solving skills, and inspire interest in STEM careers, ultimately improving educational results and opening doors to future opportunities in these fields. By focusing on practical and real-world applications, the project seeks to inspire a generation of future scientists and empower educators with modern, effective teaching strategies.

PROJECT DESCRIPTION & BACKGROUND

In Kolhapur, many government school students face significant challenges in science education due to traditional teaching methods that emphasize rote memorization rather than application-based learning. This issue is especially prevalent among children from low-income families, leading to disengagement from studies and missed opportunities to develop essential problem-solving and innovation skills. A baseline survey has revealed substantial gaps in science comprehension, highlighting the urgent need for an intervention focused on practical, hands-on learning approaches.

In response to these challenges, the Chhote Kalam Science Project has been designed to enhance science education for 6th and 7th grade students in government secondary schools. The project aims to train teachers in Project-Based Learning (PBL) techniques, which will foster hands-on, inquiry-driven learning. The initiative will involve interactive teacher workshops, classroom observations, and post-workshop discussions to empower educators to create engaging learning environments. By incorporating PBL, the project will equip students with practical knowledge of core STEM concepts, helping them bridge comprehension gaps and develop critical thinking skills.

BENEFICIARIES

The Chhote Kalam Science Project primarily benefits students from government schools in Abdullat, Shivnakwadi village, and the surrounding 6 villages. These students, primarily aged 11 to 15, will directly engage with hands-on science experiments and interactive learning modules provided by the project. Many of these students come from economically disadvantaged backgrounds, with 80-90% from low-income families, including those of sugarcane cutter workers, and the remaining students from low-income farming families.

Additionally, the project indirectly benefits educators by providing training and resources to enhance their ability to deliver hands-on science education and integrate practical learning into the curriculum. School principals and administrators also benefit by supporting the integration of STEM learning within the school framework. Moreover, local communities will experience the ripple effects of improved educational outcomes, fostering the overall upliftment of educational standards in the region.

In the long term, future cohorts of students in these areas will continue to benefit from the sustainable impact of the project, as it aims to create a replicable and scalable model for hands-on STEM education.

PROGRESS ON KEY ACHIEVEMENTS

During the July-September 2024 quarter, the Chhote Kalam Science Project undertook several key activities to enhance STEM education in government schools. Significant achievements include the implementation of the 'Science Corner' concept in council schools for 6th and 7th-grade students, aimed at increasing their interest in science and encouraging research. Teachers were trained in Project-Based Learning (PBL) techniques to facilitate hands-on, inquiry-driven science education.

In addition, a series of innovative activities were conducted to engage students. These included yoga classes based on natural resources, where students explored elements of air and the structure of nature, deepening their understanding of scientific concepts. A Rakhi-making activity was also organized, which helped students develop art, cooperation, and creativity skills, fostering unity and harmony within the school.

The project also focused on enhancing students' skills in aviation through the Small Science Club, providing them with opportunities to explore the scientific aspects of aviation. Furthermore, a monthly education dialogue with teachers facilitated knowledge exchange, with teachers incorporating more practical science experiments into their lessons, increasing the focus on hands-on learning in the classroom.

These activities have not only improved student engagement and attendance but have also laid the foundation for fostering a deeper interest in STEM fields among students.

PROGRESS ON KEY ACHIEVEMENTS

I) IMPLEMENTATION OF 'SCIENCE CORNER' CONCEPT

- TARGET GROUP: 6TH AND 7TH-GRADE STUDENTS
- OBJECTIVE: TO INCREASE STUDENTS' INTEREST AND AWARENESS OF SCIENCE
- ACTIVITIES: STUDENTS DEMONSTRATED NEW SCIENCE CONCEPTS, PROVIDING HANDS-ON EXPERIENCE AND FOSTERING A DEEPER UNDERSTANDING OF STEM TOPICS.
- OUTCOME: ENHANCED SCIENTIFIC CURIOSITY AND A STRONGER FOUNDATION FOR RESEARCH IN SCIENCE, WITH STUDENTS ACTIVELY ENGAGING IN SCIENCE DEMONSTRATIONS.

II) YOGA CLASSES BASED ON NATURAL RESOURCES

- TARGET GROUP: 6TH AND 7TH-GRADE STUDENTS
- OBJECTIVE: TO DEEPEN UNDERSTANDING OF AIR ELEMENTS, NATURE'S STRUCTURE, AND ITS FUNCTIONS
- ACTIVITIES: YOGA SESSIONS USING COMPASSES TO EXPLORE NATURAL ELEMENTS AND STUDY THE CONCEPTS OF AIR.
- OUTCOME: IMPROVED CONCEPTUAL UNDERSTANDING OF NATURAL RESOURCES AND INCREASED KNOWLEDGE OF ENVIRONMENTAL SCIENCE.

III) RAKHI-MAKING ACTIVITY

- TARGET GROUP: ALL STUDENTS
- OBJECTIVE: TO FOSTER COOPERATION, CREATIVITY, AND TEAMWORK AMONG STUDENTS
- ACTIVITIES: STUDENTS MADE COLORFUL RAKHIS USING VARIOUS MATERIALS, PROMOTING TEAMWORK AND ARTISTIC SKILLS.
- OUTCOME: INCREASED SCHOOL UNITY AND HARMONY, WITH STUDENTS WORKING COLLABORATIVELY AND ENGAGING IN CREATIVE ACTIVITIES.

PROGRESS ON KEY ACHIEVEMENTS

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IV) SMALL SCIENCE CLUB - AVIATION SKILLS

- TARGET GROUP: YOUNG STUDENTS
- OBJECTIVE: TO ENHANCE SKILLS AND KNOWLEDGE IN AVIATION AND ITS SCIENTIFIC ASPECTS
- ACTIVITIES: ENGAGING STUDENTS IN ACTIVITIES THAT EXAMINE THE NATURAL AND SCIENTIFIC ASPECTS OF AVIATION.
- OUTCOME: IMPROVED SCIENTIFIC THINKING AND SKILLS IN AVIATION, CREATING INTEREST IN THE FIELD AND ENCOURAGING EXPLORATION OF AVIATION CAREERS.

V) TEACHER TRAINING - EDUCATION DIALOGUE

- TARGET GROUP: TEACHERS OF ZILLA PARISHAD SCHOOLS
- OBJECTIVE: TO IMPROVE SCIENCE TEACHING THROUGH PRACTICAL EXPERIMENTS
- ACTIVITIES: TEACHERS ENGAGED IN MONTHLY EDUCATION DIALOGUES TO EXCHANGE KNOWLEDGE AND DISCUSS EFFECTIVE TEACHING METHODS.
- OUTCOME: INCREASED USE OF PRACTICAL EXPERIMENTS IN TEACHING SCIENCE, LEADING TO MORE HANDS-ON AND ENGAGING LESSONS FOR STUDENTS.

VI) STUDENT ENGAGEMENT AND ATTENDANCE

- ACTIVITIES: INCREASED STUDENT ENROLLMENT AND ATTENDANCE THROUGH THE IMPLEMENTATION OF INTERACTIVE AND HANDS-ON LEARNING METHODS.
- OUTCOME: HIGHER STUDENT ENGAGEMENT, IMPROVED ATTENDANCE, AND GREATER INTEREST IN STEM SUBJECTS.

CHALLENGES

Implementing STEM education in rural areas faces several challenges, including limited resources for science equipment and materials, which hinders hands-on learning. Additionally, many parents lack awareness of the importance of STEM education, affecting their involvement in their children's academic progress. Irregular school attendance due to student mobility in migrant families further disrupts learning, requiring flexible program delivery to keep students engaged. Expanding the program to more schools is also challenging due to logistical constraints, limited funding, and the need for additional resources like teachers and materials. Addressing these issues requires careful planning and resource allocation.

MAJOR OUTCOMES

- Tailored Curriculum: A practical curriculum was successfully implemented in five primary schools, aligning with students' learning needs.
- Student Engagement: The Rakhi-making activity promoted creativity, cooperation, and unity among students, strengthening school harmony.
- Educational Continuity: Collaboration with Vidyoday Muktangan Parivar Foundation ensured continuous education for migrant children.
- Increased Student Enrollment and Attendance: Increased enrollment and an 80-90% attendance rate were achieved through grassroots efforts.
- Scientific Skill Enhancement: The ‘ Science Corner ’ project and Science Corner events boosted students' interest in research and scientific exploration.
- Aviation and Scientific Thinking: Activities under the Small Science Club enhanced young men's aviation skills and scientific thinking.
- Teacher Development: Monthly dialogues led to the adoption of hands-on science experiments, improving practical science teaching methods.

CONCLUSION

The Chhote Kalam Science Project has made notable strides in enhancing STEM education in the July-September 2024 quarter.

Key activities, such as the 'Science Corner' for 6th and 7th graders, yoga classes exploring natural resources, and creative sessions like Rakhi-making, have increased student engagement and curiosity. The Small Science Club and teacher dialogues have further promoted scientific thinking and hands-on learning. Despite challenges like limited resources, low parental involvement, and student mobility, the project has successfully improved enrollment, attendance, and scientific skills. Addressing these issues and expanding the program will be vital for sustained success.