IMPACT ASSESSMENT REPORT OF STEM LABS PROJECT, ALWAR

September 2026

Pernod Ricard India Private Limited

Price Waterhouse Chartered Accountants LLP

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List of Acronyms

CSR	Corporate Social Responsibility
DIY	Do-It-Yourself
FGD	Focus Group Discussions
IDI	In-depth Interviews
IRECS	Inclusiveness, Relevance, Effectiveness, Convergence, and Sustainability
KPI	Key Performance Indicators
PRIF	Pernod Ricard India Foundation
PRIPL	Pernod Ricard India Private Limited
PWCALLP	Price Waterhouse Chartered Accountants LLP
SDGs	Sustainable Development Goals
STEM	Science, Technology, Engineering, Mathematics
UN	United Nations

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1. Executive Summary

Pernod Ricard India Private Limited (PRIPL) with the help of Yuva Unstoppable implemented the 'STEM Labs Project' project in Behror block of Alwar district, Rajasthan, as part of its CSR commitment to promote quality education. The project focused on promoting experiential and activity-based learning by providing students with access to scientific models and DIY learning kits. It also sought to enhance students' conceptual understanding of science subject through hands-on experiential learning environment and encourage curiosity helping them to explore, experiment and create

PRIPL engaged Price Waterhouse Chartered Accountants LLP (PWCALLP / PW) to assess the impact of the project interventions done during January 2023–March 2024. PW adopted a mixed-method approach comprising both quantitative and qualitative research. Quantitative survey was conducted with 284 beneficiaries while qualitative interactions included 34 FGDs, IDIs and KIIs with students, teachers, school management team / principals, government official, the implementing partner and PRIPL. Findings were organised using the IRECS framework (Inclusiveness, Relevance, Effectiveness, Convergence, Sustainability). The project details and the approach adopted for carrying the impact assessment are illustrated below:

Implementing partner

Yuva Unstoppable

Project period

January 2023 to March 2024

Research method

Mixed method

Project budget

~INR 1.04/- Cr.

~INR 1.89 lakh (Per school cost)

Sample size

284 student interviews and 34 key stakeholder interactions

Research framework

IRECS

Key findings from the impact assessment study:

Improved Access and Utilisation of STEM Learning Infrastructure

- The project integrated STEM labs into routine academic activities and recognised them as an important resource for strengthening STEM learning with 69% of the students accessing the labs daily and 31% accessing them weekly.
- High availability of science learning resources was reported, with 98% students acknowledging presence of working models, 93% reporting availability of educational posters, and 88% confirming availability of supporting lab infrastructure.
- Prior to the intervention, 28% of students attended school for 16-20 days in a month, while post-intervention, 36% students reported attending school for 16-20 days a month indicating the positive impact on student attendance, reflecting increased engagement and interest.
- Majority of the students (95%) reported that their interest in science subject increased after STEM Labs were introduced in their schools. Teachers and principals also noted that the availability of science models in the labs enhances understanding and provides valuable hands-on learning opportunities.

Enhanced Experiential and Activity-Based Learning Exposure

- All the surveyed students reported active engagement with models present in the STEM Labs. Additionally, 89% mentioned observing various STEM models and 85% also reported participating in guided experiments conducted by teachers.
- Out of all the students surveyed, 74% reported engaging in self-learning and exploratory activities and 61% of students reported participation in group-based learning activities within the STEM labs.

Additionally, the students also they reported strong preference for experiential learning over traditional classroom methods.

- The teachers reported that the STEM lab resources supported demonstration-based teaching and enabled them to conduct activity-based sessions more effectively.
- Initially, baseline data indicated that 78.3% of students (n=120) had never participated in any DIY activity or science experiments. However, during the impact assessment, 85% of students reported active involvement in guided experiments with teachers.
- All surveyed students mentioned that their academic performance in science-based subject has improved after the implementation of the project since learning is more engaging, practical, and application oriented.

Improvement in Conceptual Understanding & Student Interest in Science Subject

- A significant proportion of students (99%) reported that STEM labs helped them understand science subject better and 95% also reported a noticeable increase in their interest in science subject following introduction of STEM labs.
- The majority of students reported positive academic impacts from STEM Labs, with 94% stating increased interest in science boosted their academic performance. Additionally, 79% experienced better topic retention through visual and model-based learning, 77% found complex topics easier to understand via hands-on approaches, and 65% felt that STEM Labs made studying more enjoyable and engaging.
- Increased confidence in self-learning after exposure to STEM labs was reported by 97% of the surveyed students, 100% reported increased curiosity and willingness to ask questions during STEM learning sessions and 100% reported increased confidence in performing experiments and handling lab models and DIY kits.
- Although many schools lack the necessary infrastructure and funding to establish dedicated STEM labs resulting in STEM models being stored away and used only when needed teachers and principals still confirmed an increase in student participation and willingness to engage in classroom discussions following the introduction of STEM labs.

Strengthening Teacher-Supported Learning Environment

- 99% of students surveyed reported that teachers were able to effectively deliver STEM-based instruction using STEM Labs and 92% reported that teachers were able to provide hands-on learning opportunities to a great extent.
- Teachers and principals mentioned that most schools received one to two training sessions on STEM Labs utilisation, which supported teachers in integrating lab resources into classroom instruction. It was also suggested by the teachers that there should be at least half-yearly refresher training which will help them in hands-on learning and will also be beneficial for newly appointed / transferred teachers who were not part of the initial training earlier.
- It was highlighted by the teachers that there was a need for additional lab resources such as higher number of hands-on experiment kits, visual models and basic lab equipment aligned to the updated syllabus as the to help the students better understand science subject.

Recommendations:

- Implement half-yearly refresher training sessions to strengthen teacher capacity through subject-specific modules aligned with the curriculum helping teachers to adopt hands-on teaching methods and better connect lab activities with classroom learning, improving overall educational outcomes.
- Incorporate branding prominently into the STEM lab project, as it was largely missing during field visits. Clear and consistent branding will acknowledge the corporate's contribution, enhance visibility, strengthen stakeholder engagement, and foster pride among students, educators, and the community.

- Conduct a preliminary assessment to identify schools with suitable facilities for permanent STEM lab installation. This targeted approach will enable effective deployment, ensure consistent use of resources, and maximize the impact of the STEM lab initiative.
- Development of a Sustainability Plan for STEM Labs:
    - Embed STEM Labs into the weekly school timetable to ensure consistent, hands-on learning for all students, preventing underutilization and making STEM education a regular part of classroom instruction.
    - Identify and train 1-2 “STEM Champions” among teachers to lead the initiative, equipped with technical and pedagogical skills. Additionally, forming student-led STEM clubs can encourage peer learning and reduce reliance on external support.
    - Prioritize the use of existing lab kits and encourage students to supplement them with locally available or recycled materials and institute basic maintenance protocols like inventory tracking and repairs to prolong equipment life. Financial support can come from school grants, community contributions, or small CSR inputs, but the approach should avoid dependence on major external funding.
    - Implement simple monitoring tools such as usage registers, project logs, and participation indicators at school level to ensure accountability and enable ongoing improvement of the STEM Lab program.
- Development of Convergence Plan:
    - Integration with existing educational frameworks and government-supported programs to maximize reach and impact. Alignment with initiatives supported by the Government of India can provide both direction and scalability and STEM Lab activities can be mapped to curricular learning outcomes in science and mathematics, ensuring that lab sessions reinforce classroom concepts rather than functioning as parallel activities. Convergence with existing platforms such as Atal Tinkering Labs (where available), state science exhibitions, and district-level academic programs will allow students to use the STEM Labs as preparation spaces for broader academic and innovation opportunities.

      Additionally, coordination with district education officials will help institutionalize reporting, streamline resource allocation, and include STEM Labs in school development plans, enabling scalability and sustained impact beyond the current project schools.
    - Partner with nearby colleges, technical institutes, or NGOs in Behror can provide mentorship, teacher training, and exposure visits. Additionally, implement regular parents walk-in sessions at the STEM Labs to observe their children’s practical learning experiences firsthand, interact with teachers and facilitators, and understand the benefits of experiential learning through STEM education to create a supportive environment that motivates students and encourages continued participation in STEM activities.
- Shifting from Transactional approach to Transformational approach: Move from infrastructure provision to learning outcomes to build skills such as problem-solving, critical thinking, and creativity among students through structured activity plans, defined learning outcomes for each session, and continuous teacher support.
    - Adopt a thematic, problem-solving approach where students work on real-life challenges relevant to their context such as water conservation, waste management, or energy efficiency to help students connect learning with their lived experiences. Additionally, introduce structured pedagogy and usage frameworks and follow simple weekly modules or activity calendars, ensuring consistency in lab usage.
    - Integrate Artificial Intelligence (AI) into STEM Labs in a simplified, application-oriented manner rather than as a complex technical subject. Foundational concepts such as pattern recognition, data, and automation can be taught through games, activities, and basic digital tools. For schools with basic digital access (e.g. computers), beginner-friendly AI platforms and visual tools can be

introduced to create simple models such as image recognition or voice-based applications and can be linked to real-world projects, for instance, identifying types of waste, recognizing plant species, or analyzing simple environmental data.

- Organize periodic STEM competitions and student group showcases within the schools, inviting parents to attend and celebrate their children's achievements. These events would provide students with a 'proud moment' to present projects and innovations. Additionally, aligning these competitions with the National STEM Competition conducted by the Government of India would prepare students for higher-level challenges, elevate the program's visibility, and foster a culture of excellence.

Comprehensive analyses, detailed findings & observations, recommendations, and testimonials are presented in the subsequent sections of this report.

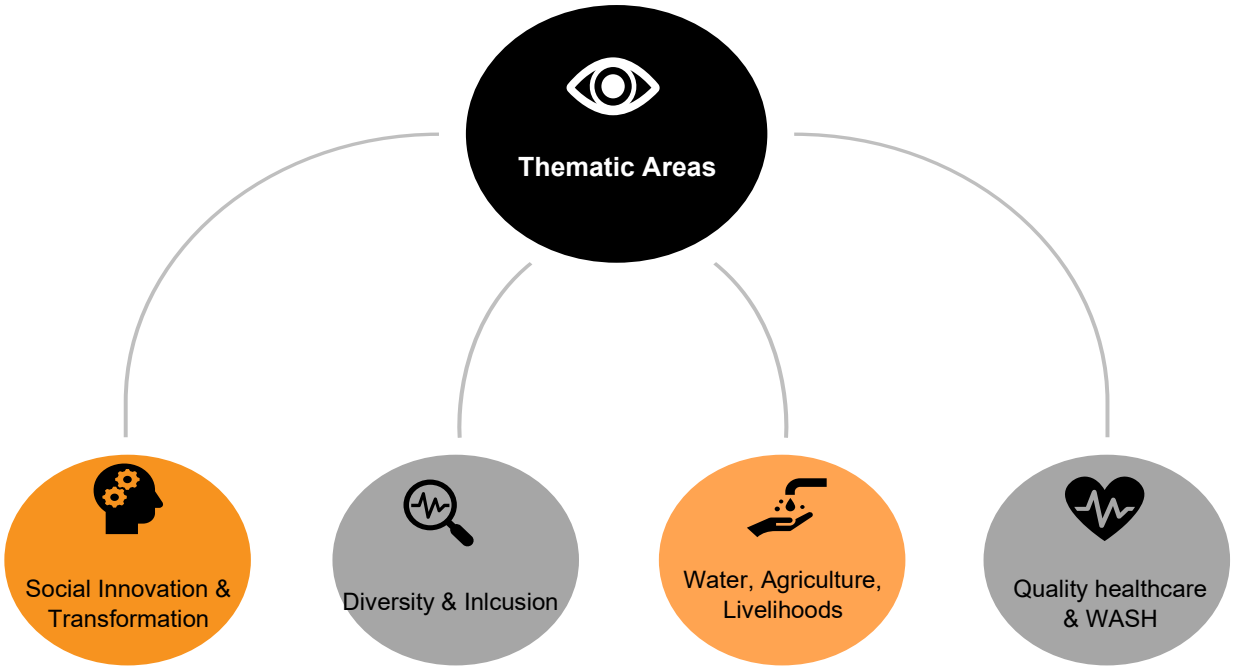
2. About PRIPL

Pernod Ricard India Private Limited (PRIPL), a multinational alcohol beverage company. As a wholly owned subsidiary of Pernod Ricard South Asia, PRIPL boasts over 30 years of heritage in India, with operations including a distillery in Nashik and 24 production sites nationwide.

PRIPL is dedicated to responsible business practices and community involvement through its Corporate Social Responsibility (CSR) initiatives. Guided by PRIPL's CSR Policy, these initiatives prioritize sustainable development and address the needs of marginalized and disadvantaged communities throughout its operational regions in India.

The Pernod Ricard India Foundation (PRIF), a Section 8 Company and a wholly owned subsidiary of PRIPL, leads the company's CSR endeavours. PRIF is committed to driving transformational growth and development in strategic program areas. PRIPL engages actively with stakeholders, such as government bodies and community members, to ensure meaningful CSR initiatives. Through sustained community engagement, PRIPL strives to enhance local development, strengthen communities, and ensure opportunities for everyone to prosper[1].

Figure 1: Key thematic areas of PRIF



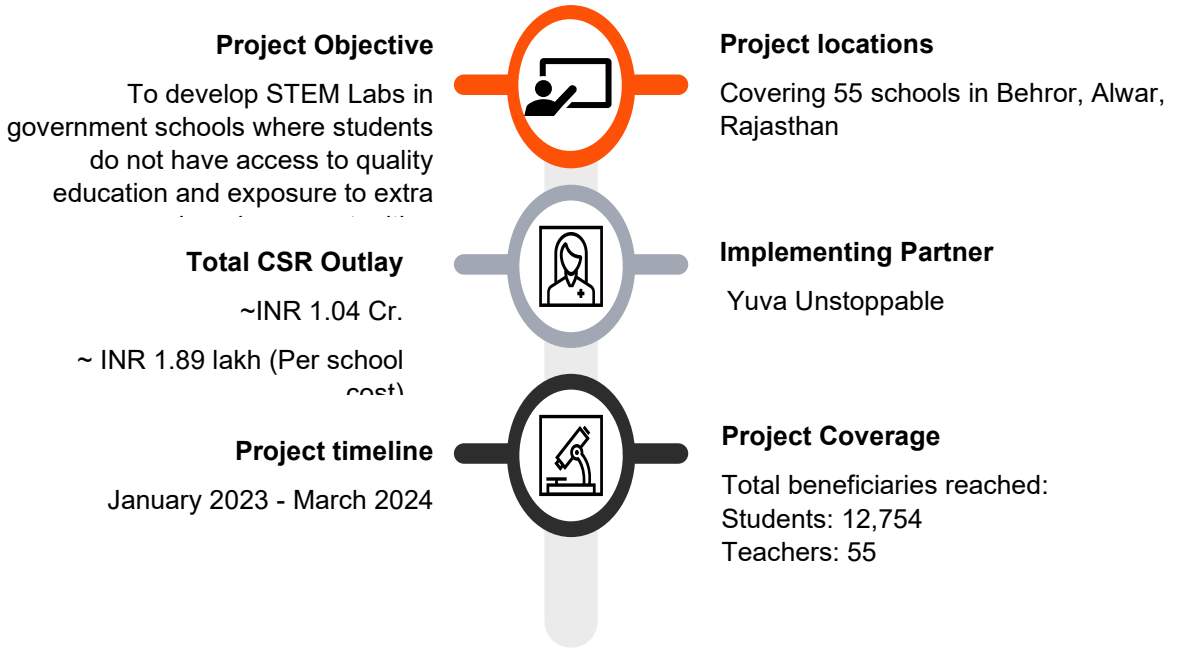
3. About the project

The **STEM Labs project** was implemented with the objective of strengthening science, technology, education and mathematics through the establishment of **STEM Labs** in **55 government schools** across **Behror (Alwar, Rajasthan).** The initiative aimed to promote **experiential and activity-based learning by providing students with access to scientific models and DIY learning kits.** The project sought to enhance students' conceptual understanding of science subject through hands-on experiential learning environment and encourage curiosity helping them to explore, experiment and create[2].

[1] Source: CSR program report 2023-24, Website
[2] Source: Project Documents shared by PRIPL and Implementing Partner

The project was implemented **in response to the limited availability of functional lab infrastructure in many government schools**, where STEM based education is often delivered through theoretical instructions with minimal practical exposure. The introduction of STEM Labs was intended to bridge this gap by enabling hands-on learning opportunities and supporting teachers in delivering interactive and application-oriented science education. Below figure provides the project specifics:

Figure 2: Snapshot of the CSR project under assessment



The key activities carried out under the project included:

- Establishment of STEM Labs in government schools which included working scientific models and essential furniture
- Providing STEM-based Do-It-Yourself (DIY) kits to encourage activity-based and hands-on learning among students.
- Installation of educational posters to support visual learning and reinforce theoretical concepts.
- Orientation and training sessions for teachers to build their capacity to effectively integrate STEM Lab resources into regular teaching practices.

4. Method of Impact Assessment

Pernod Ricard India Private Limited (PRIPL) engaged Price Waterhouse Chartered Accountants LLP (PWCALLP) to carry out the impact assessment of the project with a purpose to evaluate the impact created during the project period of January 2023 to March 2024. The scope of work included reviewing the Key performance indicators (KPIs) as defined by the Management of the PRIPL under the framework for implementing the Project for the outputs, outcomes and impact of the Project. Framework adopted was Inclusiveness, Relevance, Effectiveness, Convergence, and Sustainability Framework (the 'IRECS') and recommendations were provided on the Project's performance for their further evaluation and consideration.

The assessment was undertaken using quantitative and qualitative methods to understand the interventions undertaken under the CSR project in mutual discussion with PRIPL. The scope of work involved conducting desk reviews of the project documents, mapping of key project stakeholders, developing research methodology & impact map, data collection & analysis and report writing.

The overall methodology adopted for conducting the impact assessment study can be categorized into four stages as illustrated below:

Stage 1: Desk review

- Inception meeting was done with the PRIPL team and the Implementing Partner (IP) to get a detailed understanding of the interventions.
- Built consensus on scope of work and understanding PRIPL expectations.
- Desk review of project documents (such as MoU with implementing partner, Baseline Study, Program and Kick-off Document etc.) was done.
- Based on the desk review and preliminary interactions with key stakeholders from PRIPL, mapping of project stakeholders was done in consultation with PRIPL team for interaction purpose.

Stage 2: Planning and tool preparation

- The data collection plan was finalised in consultation with the PRIPL team.
- Key indicators, research tools were also shared and finalised post incorporation of feedback from PRIPL team.
- Digitisation and translation of the developed tools in local language (Hindi) was undertaken.
- PRIPL team was then apprised about the data collection plan for the field visit.

Stage 3: Data collection & field visit

- The field team was trained on the data collection tools.
- The implementing partner (IP) mobilized stakeholders on the field.
- The field data collection process was initiated.
- Quantitative survey with project beneficiaries was undertaken to record their feedback.
- In-depth Interviews (IDIs) with students, teachers, principals, PRIPL Team and Block Official were conducted.
- Focus Group Discussion (FGD) with students were undertaken to gauge their views on the project.

Stage 4: Data analysis and report writing

- Assimilated the key findings to better analyse the data.
- Prepared the draft of the impact assessment report to PRIPL team.
- Obtained and incorporated feedback received from PRIPL.
- Prepared and submitted final impact assessment report to PRIPL.

4.1 Sampling plan

The project's impact was evaluated using a mixed research methodology, which involved both qualitative and quantitative tools to gain comprehensive insights. As part of the quantitative approach, a structured sampling plan was deployed, involving a survey with **a sample size of minimum 271 beneficiaries. The sample was calculated based on 90% confidence level and 5% margin of error** by considering the total number of beneficiaries covered under the project as the universe. The study, however, **covered 284 beneficiaries** and the findings and analysis presented in the following sections of the report are based on the responses from the 284 samples achieved from 10 schools.

As a part of the qualitative assessment, the following interactions including In-Depth Interviews (IDIs), Focus Group Discussions (FGDs) and Key Informant Interview (KII) were also conducted to ensure holistic feedback on the project activities from the stakeholders:

Table 1: Qualitative sampling plan

Stakeholder Name	Mode of interaction	No. of interactions
Students	FGD	10
Teachers	IDI	11
School Management Team / Principals	IDI	10
Block Education Officer	KII	1
Implementing Partner	IDI	1
PRIPL Team	IDI	1
Total		**34**

4.2 Assumptions and Limitations

General:

- The information transmitted, including any attachments, are intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material. Any review, retransmission, dissemination, copying, paraphrasing, reproduction, or distribution in any manner or form, whether by photocopying, electronically, by internet, within another document or otherwise; or other use of or taking of any action in reliance upon this information by persons or entities other than the intended recipient or for purposes other than as stated in the Agreement, is prohibited. Further, any quotation, citation, or attribution of this publication, or any extract from it to any third party unless expressly agreed in the Agreement is strictly prohibited. PWCALLP makes no representations or warranties regarding the information and expressly disclaims any contractual or other duty, responsibility or liability to any person or entity other than its client in accordance with the agreed terms of engagement.

- The nature of service provided under this engagement does not in any manner constitute provision of legal service or/ advice as the term is generally understood under various laws for the time being in force. The intent of PWCALLP was to provide assistance and support in accomplishing the stated objective of the assignment and as an adjunct activity may have included research of applicable laws, regulatory compliance requirements and an understanding of the process and procedure as per local statutory enactments without in any way rendering any specialist legal advice. Our report is not a substitute for legal advice, that may be provided by a duly qualified independent legal practitioner.

- Our scope of work, including any advice/ assistance, was limited to the scope of services specifically defined in the Letter. We were not responsible for the implementation of our recommendations.

- By giving our consent to the publication of our report and opinion on the Company's website ('your website') we do not accept any duty of care and deny any liability.

- You are responsible for the controls over and the security of your website and, where applicable, for establishing and controlling the process for electronically distributing Impact Assessment Report. We remind you that the examination of controls over the maintenance and integrity of your website is beyond the scope of our examination. Accordingly, we accept no responsibility for the completeness and accuracy of the Impact Assessment Report as they appear on your website.

Pertaining to this report:

- The report prepared by the PWCALLP is based upon the (a) information/ documents provided by PRIPL and its implementation partner and (b) data collected during the field visit to the project location by the PWCALLP team. PWCALLP performed and prepared the Information at the client's direction and exclusively for the client's sole benefit and use pursuant to its client agreement. Our report is based on the completeness and accuracy of the above-stated facts and assumptions, which if not entirely complete or accurate, should be communicated to us immediately, as the inaccuracy or incompleteness could have a material impact on our conclusions.

- PWCALLP's work was limited to the samples/ specific procedures described in this report and were based only on the information and analysis of the data obtained through interviews of beneficiaries supported under the project, selected as respondents. Accordingly, changes in circumstances/samples/ procedures or information available could affect the findings outlined in this report.

- The project assessed as part of this report was identified and selected for impact assessment by Pernod management. PWCALLP has relied on the information and representations provided by Pernod in this regard and has not independently verified the applicability or eligibility of the selected project under the provisions of the Companies (Corporate Social Responsibility Policy) Rules, 2014, or any subsequent amendments thereto.

5. Key findings and analysis

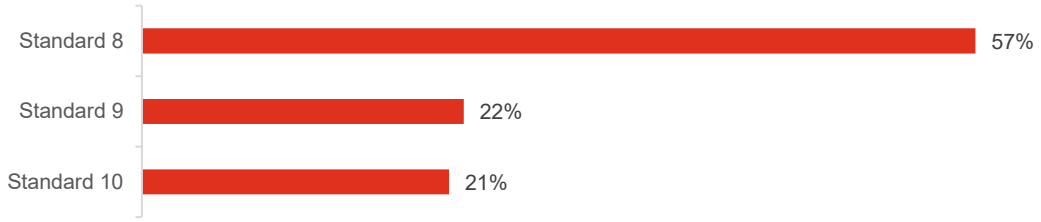
This section of the report highlights the key findings and analysis on the impact created by the STEM Labs project among the stakeholders in Alwar district of Rajasthan. The findings and analysis are based on the responses of 284 participants (N=284) of the quantitative study along with information gathered during the qualitative interactions with key stakeholders.

5.1 Profile of the students

This section provides an overview of the respondents involved in the STEM Labs project. The data collected offers insight into the student profile and highlights relevant aspects.

- **Gender Distribution:** The survey responses indicate a fairly balanced participation, with 48% of respondents (n=284) identifying as female and 52% as male.
- **Class Range:** A majority of the respondents (n=284), 57%, were from Standard 8, while 22% were from Standard 9, and 21% from Standard 10. The higher proportion of Standard 8 students is because Standard 10 students were occupied with Board exam preparations. The primary focus was on engaging students from Standards 8 to 10, as they were first introduced to STEM labs during their 6th to 8th grades.

Figure 3: Grade of the respondents



5.2 Need for the intervention

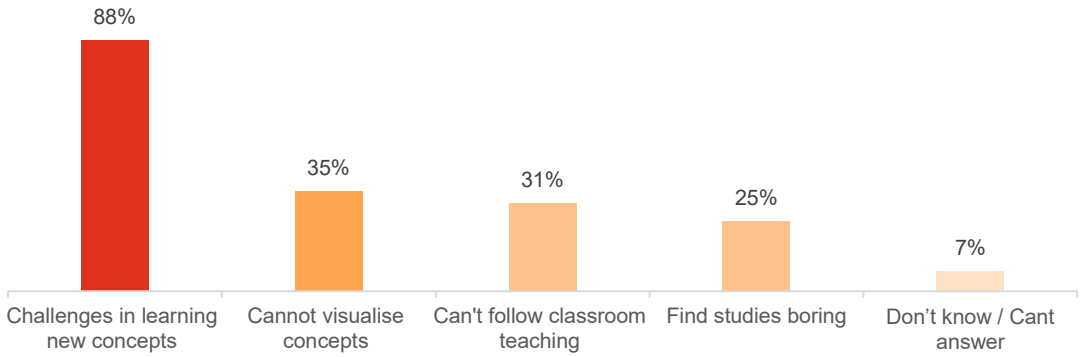
Discussions with students and teachers, coupled with the baseline & need assessment[3] conducted by the implementing partner, have revealed following challenges faced by government schools in the project location:

1. Science learning in government schools was largely theoretical with limited exposure to practical and activity-based learning.
2. Majority of students relied primarily on books as their main source of knowledge, indicating limited exposure to interactive or experimental learning tools.
3. Access to STEM learning resources outside school was found to be limited, highlighting the school's role as the primary source of experiential learning.
4. Although students have basic familiarity with science concepts, there was limited exposure to structured experiments and hands-on activities
5. Teachers faced challenges in delivering interactive and demonstration-based science education, indicating a need for additional support and resources.

[3] Baseline and Need assessment findings shared by Implementing partner

During quantitative interactions, it was also confirmed by the respondents (n=284) that prior to the STEM Lab setup they faced challenges in learning new concepts and had difficulty in visualizing concepts as demonstrated in the figure below:

Figure 4: Challenges in learning science-based subject without STEM Labs



Figures may not add upto 100% since this was a multiple-choice question

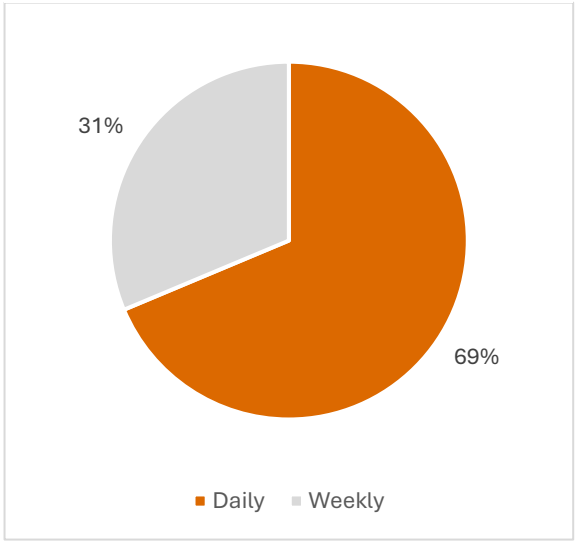
5.3 Impact of the intervention

1. Improved Access and Utilisation of STEM Learning Infrastructure

- All the surveyed students (n=284) reported **regular utilisation of STEM lab**, with 69% accessing the labs daily and 31% accessing them weekly. During qualitative interactions with principals and teachers across 10 schools, it was noted that schools have integrated STEM labs into routine academic activities and recognised them as an important resource for strengthening STEM learning.

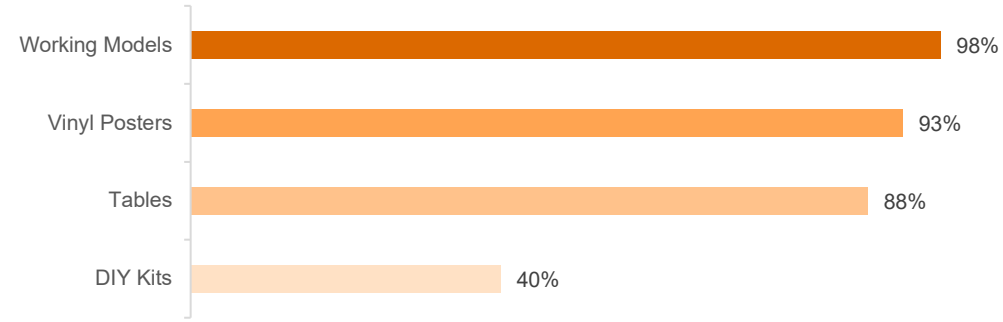
  On probing further, team noted that supporting documents (e.g. daily routine schedule) were available at the schools, which outlined the daily academic routine and highlighted the commitment to using STEM labs. However, the frequency of **access to STEM labs is dependent on the class schedules created by the teachers according to their availability**.

Figure 5: Frequency of access to STEM Labs – Students (n=284)



- High availability of science learning resources was reported, with 98% students acknowledging presence of **working models**, 93% reporting availability of **educational posters**, and 88% confirming availability of **supporting lab infrastructure**.

Figure 6: Resources present in the STEM Labs – Students (n=284)



Figures may not add upto 100% since this was a multiple-choice question.

- Prior to the intervention, 28% of students attended school for 16-20 days in a month, while post-intervention, 36% students reported attending school for 16-20 days a month. This indicates that the implementation of the STEM Labs initiative has had a positive impact on **student attendance**, reflecting **increased engagement** and **interest.**

- Majority of the students (95%, n=284) reported that their interest in science subject increased after STEM Labs were introduced in their schools. It was also mentioned by the teachers and principals that students are **more interested** in studying science based subject due to the availability of science models in the STEM Labs, which help them **understand concepts better** and offer **hands-on learning experiences**.

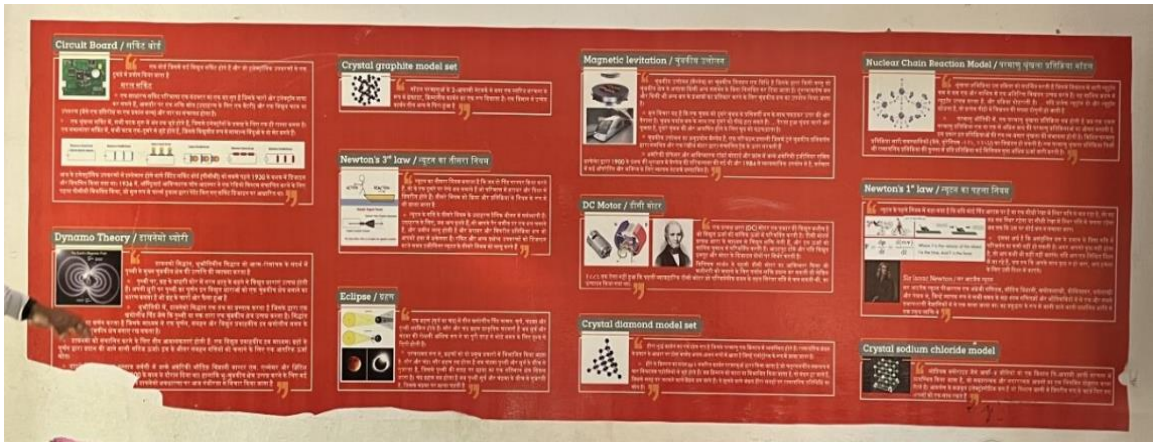
Importance of STEM Education for Behror, Rajasthan:

Introducing STEM education at the school level in Behror, Rajasthan is crucial for preparing children with the foundational skills and knowledge needed for the future. As **Behror experiences industrial growth and increasing technological advancements,** early exposure to science, technology, engineering, and mathematics will help students develop critical thinking, creativity, and problem-solving abilities from a young age. Integrating STEM subjects into school curricula can move education beyond rote memorization, encouraging hands-on learning and innovation which are essential for all areas of life and future careers.

Starting STEM education in schools also plays a vital role in creating equal opportunities for all students, including girls, by **breaking stereotypes and promoting interest in traditionally male-dominated fields like engineering and technology.** When students engage with STEM concepts early, they are more likely to pursue these fields in higher education and professional life, thereby contributing to local development and gender equity in the long run. This early foundation **empowers students and provides them with the confidence and skills to explore various career paths.**

Furthermore, schools equipped with proper STEM resources and trained teachers in Behror can help **students understand and address real-life challenges specific to their region, such as water scarcity, agriculture, and environmental sustainability.** This **localized approach to STEM education** can inspire young minds to think critically about how technology and science can resolve local problems, fostering a generation of innovators invested in their community's progress.

Figure 7: Vinyl posters in the STEM Lab



2. Enhanced Experiential and Activity-Based Learning Exposure

Figure 8: STEM Lab setup in the schools

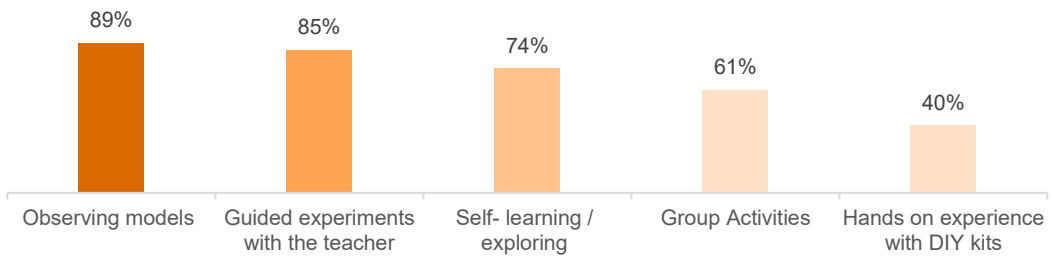


- During interactions all the students reported **active engagement with models** present in the STEM Labs. Out of all the students 89% (n=284) mentioned observing various STEM models viz. electric bell, solar system, pendulum, etc. Additionally, 85% of the students (n=284) also reported **participating in guided experiments** conducted by teachers.

- Nearly three-fourths of students (74%) reported engaging in **self-learning** and exploratory activities within the STEM labs. During FGDs with the students, they reported strong preference for **experiential learning**, with a majority opting for **hands-on learning** or blended learning approaches over traditional classroom methods.

- Around 61% of students reported participation in **group-based learning activities**, indicating collaborative learning opportunities facilitated through STEM labs. Teachers interviewed during the assessment reported that STEM lab resources supported **demonstration-based teaching** and enabled them to conduct **activity-based sessions** more effectively. The activities done by the students in the STEM Labs are as mentioned in the below figure.

Figure 9: Activities done by students in STEM Labs (n=284)



Figures may not add upto 100% since this was a multiple-choice question

- 47% of the students (n=284) prefer **hands on experiential** learning through STEM Labs, while 41% reported learning through a **combination of traditional classroom learning** and **STEM Labs.** During FGDs, the students mentioned that since the introduction of STEM Labs the classes have become **more interactive** than earlier. Initially, baseline data indicated that **78.3%** of students (n=120) had **never participated in any DIY activity** or science experiments. However, during the impact assessment, **85%** of students reported **active involvement in guided experiments with teachers**. The teachers also confirmed that the students are more participative than before in the classes and take more interest in DIY models and conducting experiments.

  "Since the introduction of STEM Labs, my interest in science subject has increased. In addition to learning through models and conducting guided experiments in the lab, I have also made science models on my own. The STEM Lab has increased my curiosity for science-based subject."

  - Student, Government Senior Secondary School, Sherpur

- All students (n=284) mentioned that their **academic performance** in science-based subject has **improved** after the implementation of the project. The students also mentioned that the STEM labs contributed to making STEM learning **more engaging**, **practical,** and **application oriented**. Feedback gathered during FGDs reflected strong student acceptance of the intervention and **demand** for continued and **expanded STEM-based learning opportunities** according to their syllabus.

Figure 10: Working models present in the STEM

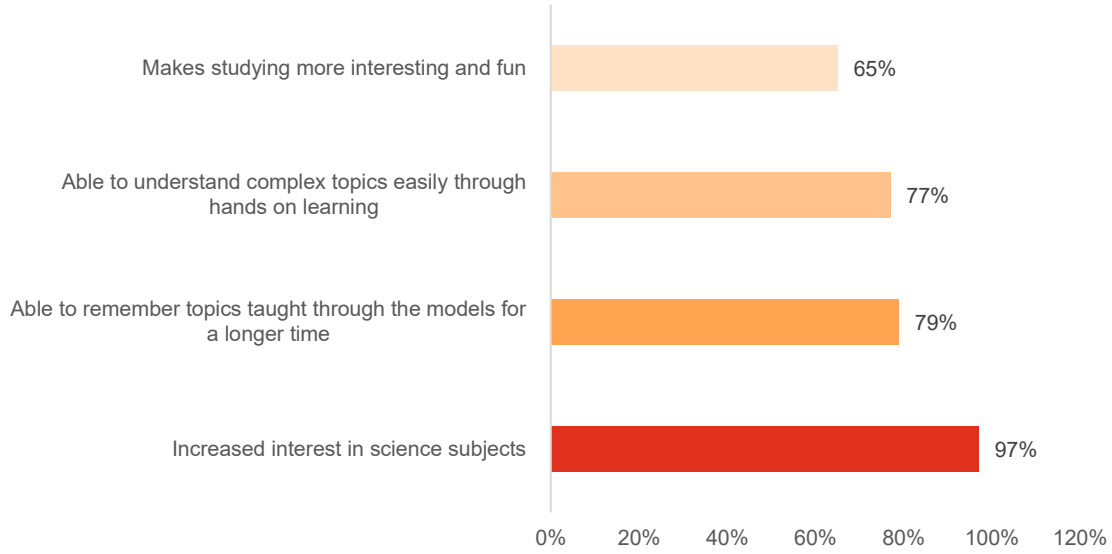


3. Improvement in Conceptual Understanding & Student Interest in Science Subject

- A significant proportion of students (99%) reported that STEM labs helped them **understand science subject better**. A large majority of students (95%) also reported a noticeable **increase** in their **interest** in science subject following introduction of STEM labs.

- Majority (94%) of the students (n=284) surveyed indicated that **increased interest** in science subject led to **increase** in **academic performance** in science subject. Additionally, 79% of the students reporting **improved retention of topics** through visual and model-based learning, 77% stating that STEM Labs helped them to **understand complex topics** more **easily** through **hands-on learning approach** and 65% of the students mentioned that STEM Labs made studying **more interesting and fun**.

Figure 11: Reason for students (n=284) increased academic performance in Science subject



Figures may not add upto 100% since this was a multiple-choice question

- During FGD, students expressed strong interest in continuing science based learning and suggested **expansion** of **lab resources** with **additional experiments** aligned to their academic curriculum.

Figure 12: Science models made by students



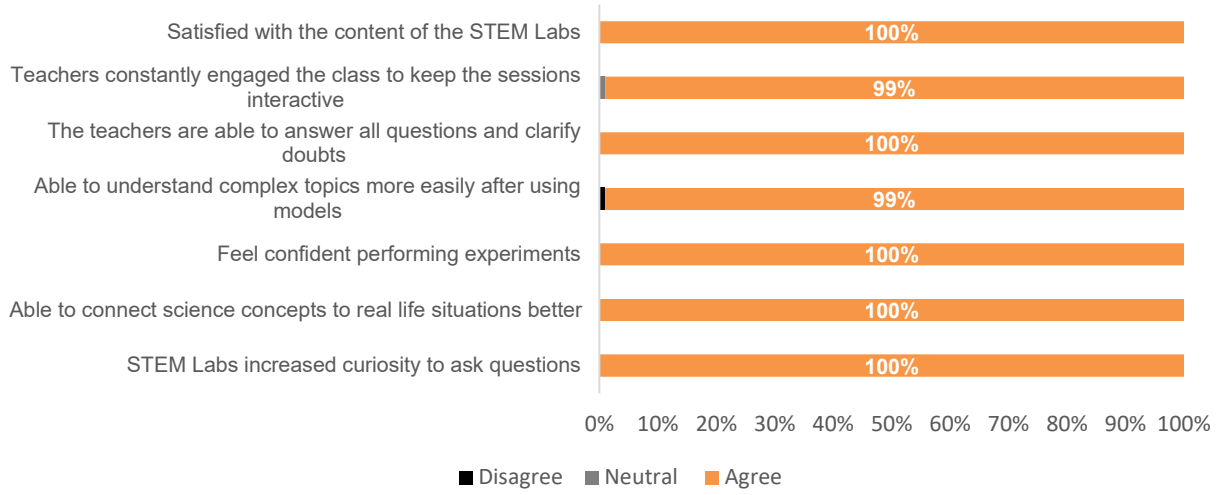
- Majority of the students (97%, n=284) reported **increased confidence** in **self-learning** after exposure to STEM labs. All surveyed students reported **increased curiosity** and **willingness to ask questions** during STEM learning sessions. Nearly all students reported **improved ability** to **connect scientific concepts** with **real-life applications**.

"Our students have started taking part in external competitions like the INSPIRE Award organized by the Department of Science and Technology, and they've even won cash prizes for their entries. This was made possible by their increased interest in science and mathematics subject, due to learning through practical models in the STEM Lab."

- Principal, GSSS Budhwal

- All students (n=284) also reported **increased confidence** in **performing experiments** and **handling lab models** and **DIY kits**. This was further confirmed by the teachers / principals that there was an **increase** in **student participation** and willingness to engage in classroom discussions following introduction of STEM labs.

Figure 13:Student perceptions of the STEM Labs



- Additionally, during field visits and discussions with the PRIF team, it was noted that many schools lack the necessary infrastructure to establish dedicated STEM labs. This issue is primarily due to insufficient resources and government funding support, making it challenging to maintain a permanent lab setup. Consequently, STEM models are often stored away and only brought out when specifically needed.

4. Strengthening Teacher-Supported Learning Environment

- Majority of students (99%, n=284) reported that teachers were able to effectively deliver STEM-based instruction using STEM Labs. Over 92% of students indicated that teachers were able to provide **hands-on learning opportunities** to a great extent.

- During qualitative interactions teachers and principals mentioned that most schools received **one to two training sessions on STEM Labs** utilisation, which supported teachers in integrating lab resources into classroom instruction. Further, it was also suggested by the teachers that there should be at least **half-yearly refresher training** which will help them in hands-on learning and will also be beneficial for newly appointed / transferred teachers who were not part of the initial training earlier.

- It was also highlighted by teachers during qualitative interactions that there was a **need for additional lab resources** such as higher number of **hands-on experiment kits**, **visual models** and **basic lab equipment aligned to the updated syllabus** as the to help the students better understand science subject.

"With the introduction of STEM Labs, teaching science subject has become much easier and more effective. Using visual models to explain science concepts has significantly enhanced students' understanding and engagement. It has helped the students to grasp complex ideas easily through the hands-on approach."

- Teacher, GSSS Rewali

6. IRECS Analysis

Basis the interactions with the key stakeholders and desk review, the impact of the project was also assessed on the IRECS framework parameters. The IRECS analysis summary has been presented in the table below:

Table 2: IRECS Analysis

Parameter	Assessment from Study
Inclusiveness	• The project demonstrated strong inclusiveness by providing access to **experiential science learning opportunities** to all students studying in grades 6 and above, **irrespective of their age, gender or caste**. Baseline findings indicated that **80.8%** of the **students** (n=120) did **not have access to any STEM resources.** • Additionally, these government schools were located in **rural locations** with industrial establishments and **did not have** the facilities of a **STEM Lab** and there was **hardly any awareness** related to additional educational resources.[4] • Quantitative findings indicated that **99%** of surveyed **students** had **accessed** and **utilised STEM labs**, reflecting **broad participation** across the student population. FGD with students further highlighted that lab-based learning created equal opportunities for students to **participate in experiments, collaborative activities**, and **self-learning sessions**, thereby supporting inclusive learning environments.
Relevance	• The intervention was found to be **highly relevant** to the needs identified during the baseline assessment. **Baseline findings** indicated that **86.7%** of the students (n=120) had a **strong preference** for **activity-based learning** approaches due to limited availability of practical learning opportunities within schools. The STEM lab intervention directly addressed the majority of the challenges mentioned by the students viz challenges in learning new concepts (88%), unable to visualize concepts (35%), etc. • Impact assessment findings indicate that **100% of the students** (n=284) reported **improved conceptual understanding** of science subject and **increased engagement** through **hands-on learning activities**. Students (88%, n=284) also expressed **preference for science lab-based learning** over traditional classroom methods, reaffirming alignment of the intervention with beneficiary learning needs and educational priorities. • During qualitative discussions, teachers noted that the **STEM lab resources** were **initially aligned** with the academic syllabus. However, as the curriculum has evolved, there is now a **need to update** the **STEM labs** to better reflect the current syllabus. This upgrade will enable students to use the STEM labs more effectively and focus on topics that are relevant to their studies.

[4] Source: Program Kickoff Deck shared by Implementing Partner

Parameter	Assessment from Study
Effectiveness	• The project demonstrated strong effectiveness in **improving learning outcomes** and **enhancing student engagement** in science education. All students (n=284) reported that STEM labs helped them **understand science concepts better** and 79% of the students (n=284) mentioned **improved retention of topics** through visual and experimental learning approaches. • Students (n=284) actively utilised lab resources, with 85% reporting **participation in guided experiments**, 89% in **observing models**, 61% in **group learning activities**, and 74% in **self-exploration** in STEM Labs. • Teacher interactions further indicated that STEM labs **enhanced demonstration-based teaching practices** and supported teachers in delivering more interactive and concept-driven science instruction.
Convergence	• The **Block Education Officer (BEO) was consulted during the selection of schools for implementing STEM Labs**. The government schools were chosen on the basis of the need and readiness for taking ownership of the STEM Labs. • STEM Labs have **increased students' interest** and **proficiency** in science subject, leading to **increased participation** in government initiatives like the **INSPIRE Award**. This award, initiated by the Indian government, encourages young students to embrace science and innovation through competitions and recognition, further motivating them to excel in science fields. • The STEM Lab project also supports the **goals of the National Education Policy (NEP) 2020**, which emphasizes experiential and practical learning for students. By setting up STEM Labs in schools, the project brings NEP 2020's vision into practice, enhancing scientific literacy and critical thinking among students.
Sustainability	• The sustainability of the project is supported by **strong adoption of STEM labs** within school teaching practices and **positive stakeholder acceptance**. School leadership interactions indicated willingness to maintain STEM Labs and continue utilisation of science learning resources. However, field visits highlighted that most schools **lack dedicated classrooms** for establishing STEM labs, which hinders their ability to house a permanent STEM setup. This challenge is primarily due to limited funding allocated to government schools. • Most schools reported that their teachers received **training sessions** on using lab resources, either **through the project itself or via government-provided STEM education** training periodically. This supports the ongoing adoption of activity-based learning approaches. Additionally, **high student utilization** and demand for science-based learning further enhance the sustainability prospects of the intervention.

Parameter	Assessment from Study
	• However, teachers recommended further strengthening teacher capacity-building mechanisms to ensure consistent implementation across project schools.

7. Recommendations

The following recommendations are based on valuable insights shared by students, teachers, principals, PRI representatives, and government stakeholders along with our own understanding of the sector. These can be considered for further improving the efficiency and effectiveness of the **similar projects in future**:

1. **Strengthening Teacher Capacity and Training:** The assessment findings indicate the need to further strengthen teacher capacity to ensure effective and consistent utilisation of STEM Lab resources. While most schools reported receiving teacher orientation sessions, variations were observed in the frequency and coverage of such training within the project. With many new or transferred teachers joining schools, regular training sessions are essential. Conducting half-yearly refresher trainings can help teachers adopt activity-based teaching methodologies more effectively and improve integration of STEM Labs into classroom instruction. Additionally, introducing subject-specific training modules aligned with academic curriculum requirements can support teachers in linking lab experiments with textbook concepts, thereby enhancing overall learning outcomes.

2. **Branding of PRIPL:** During the field visits, team noted that branding of PRIPL was missing at most of the places. It is recommended that the PRIPL branding be prominently incorporated into the STEM lab project moving forward. Including clear and consistent branding not only acknowledges the corporate's valuable contribution but also enhances visibility and reinforces their commitment to educational development. Effective branding can strengthen stakeholder engagement, build corporate reputation, and inspire confidence and pride among students, educators, and the wider community.

3. **Addressing Infrastructure Challenges for Effective STEM Lab Implementation:** Another challenge identified is the inadequate infrastructure in some government schools, where dedicated spaces for STEM labs are unavailable. In such cases, resources are unpacked and used temporarily, leading to inconsistent utilization of the labs. To address this, it is recommended to conduct a preliminary dipstick assessment to identify government schools with the necessary facilities to properly install and operationalize STEM labs. This targeted approach will ensure effective deployment, maximize resource utilization, and enhance the overall impact of the STEM lab initiative.

4. **Development of Sustainability Plan**:

   a. **Integration of STEM Education into Regular Learning Process**: To ensure long-term effectiveness of STEM Labs across the government schools, the focus must be on **embedding their usage into the regular teaching-learning process rather than treating them as add-on facilities**. During the visit, team noted that the **usage of STEM labs** was dependent on the **class schedules created by the teachers according to their availability**. Each school should integrate STEM Lab periods into the weekly timetable, ensuring that all students, especially those with limited access to quality education, **engage with hands-on learning at least once a week**.

This structured scheduling is critical to prevent underutilization, which is a common challenge in such interventions.

b. **Identification of STEM Champions and STEM clubs**: Ownership should gradually shift to school-level stakeholders, particularly teachers and school leadership. Identifying and training 1-2 “STEM Champions” per school can help anchor the initiative internally. These teachers should be equipped not only with technical know-how of the lab equipment but also with pedagogical approaches such as inquiry-based learning and experiential teaching. Over time, student-led STEM clubs can also be formed to support peer learning and maintain lab activity, reducing dependency on external facilitators.

c. **Low-cost, high-utilisation model**: From a resource perspective, sustainability should rely on a low-cost, high-utilization model. Schools under the project should prioritize the use of existing lab kits and encourage students to supplement them with locally available or recycled materials. Basic maintenance protocols such as inventory tracking, repair logs, and periodic audits should be institutionalized to ensure longevity of equipment. Financial sustainability can be supported through convergence with school grants, local community contributions, or small-scale CSR support, but the model should remain functional without heavy external funding.

d. **Continuous monitoring and reporting**: Finally, continuous monitoring and simple reporting mechanisms should be established. Schools should develop and maintain usage registers, student project logs, and basic outcome indicators such as participation rates and skill development. This data will not only support accountability but also help refine implementation over time.

5. **Development of Convergence plan**:

a. **Integration with existing educational frameworks and government-supported programs**: The STEM Labs initiative should not operate in isolation but be integrated with existing educational frameworks and government-supported programs to maximize reach and impact. Alignment with initiatives supported by the Government of India can provide both direction and scalability. For instance, **STEM Lab activities can be mapped to curricular learning outcomes** in science and mathematics, ensuring that lab sessions reinforce classroom concepts rather than functioning as parallel activities.

Convergence can also be established with **existing platforms such as Atal Tinkering Labs** (where available), state science exhibitions, and district-level academic programs. This allows students to use the STEM Labs as preparation spaces for broader academic and innovation opportunities. Additionally, **integrating STEM Lab outputs into school assessments** through project-based evaluations or internal grading, can further strengthen their relevance within the formal education system.

Administrative convergence is also key. Coordination with district education officials can help institutionalize reporting, streamline resource allocation, and ensure that **STEM Labs are included in school development plans**. This systemic alignment will be essential for scaling and sustaining impact beyond the targeted schools under this project.

b. **Partnership with local institutions and stakeholders**: It can enhance the ecosystem around these labs. Nearby colleges, technical institutes, or NGOs in Behror can provide mentorship,

teacher training, and exposure visits. Community engagement is equally important; involving parents during open house sessions or demonstration days can build awareness and support for experiential learning, especially in communities where such exposure is limited.

To strengthen the **community-school relationship and enhance parental engagement**, it is recommended to implement regular parents walk-in sessions at the STEM Labs. These sessions can serve as an opportunity for parents to observe their children's practical learning experiences firsthand, interact with teachers and facilitators, and understand the benefits of experiential learning through STEM education. Building this rapport will increase parents' awareness and involvement, creating a supportive environment that motivates students and encourages continued participation in STEM activities.

6. **Shifting from 'Transactional' approach to 'Transformational' approach**:

A critical shift required in the current approach is moving from **infrastructure provision to learning outcomes**. Instead of focusing primarily on the presence of STEM Labs, the emphasis should be on how effectively they are used to build skills such as problem-solving, critical thinking, and creativity. This requires structured activity plans, defined learning outcomes for each session, and continuous teacher support.

a. One effective practice is adopting a **thematic, problem-solving approach** where students work on real-life challenges relevant to their context such as water conservation, waste management, or energy efficiency. This not only enhances engagement but also helps students connect learning with their lived experiences. Multi-grade and peer learning models can also be introduced, where older students mentor younger ones, fostering collaboration and leadership.

Another important improvement is the introduction of **structured pedagogy and usage frameworks**. Schools can follow simple weekly modules or activity calendars, ensuring consistency in lab usage. Documentation of student work through project notebooks, photos, or short presentations should be encouraged as a good practice to track progress and build student portfolios. Regular teacher reflection sessions and peer-sharing forums can also help improve implementation quality across schools.

b. Integrating **Artificial Intelligence (AI)** into STEM Labs is both feasible and valuable, even in government school contexts, if approached appropriately. AI should be introduced in a simplified, application-oriented manner rather than as a complex technical subject. Foundational concepts such as pattern recognition, data, and automation can be taught through games, activities, and basic digital tools. For example, students can explore how machines "learn" by sorting objects, recognizing patterns, or analyzing simple datasets.

For schools with basic digital access (e.g. computers), beginner-friendly AI platforms and visual tools can be introduced to create simple models such as image recognition or voice-based applications. These can be linked to real-world projects, for instance, identifying types of waste, recognizing plant species, or analyzing simple environmental data. Teachers will require targeted training to confidently introduce these concepts, focusing on practical usage rather than theory.

c. **Host STEM Competitions:** It is recommended to organize periodic STEM competitions and student group showcases within the schools, inviting parents to attend and celebrate their children's achievements. These events would provide students with a 'proud moment' to present projects and innovations, thereby boosting their confidence and motivation. Additionally, aligning

these competitions with the National STEM Competition conducted by the Government of India would prepare students for higher-level challenges, elevate the program's visibility, and foster a culture of excellence. Including parents in these milestone events can deepen their pride and support for the STEM Labs initiative.

8. Study Limitations

- **Limited Insights from Block Education Officer:** Interaction was conducted with the Block Education Officer (BEO), a government official; however, valuable insights were limited as the BEO was newly appointed and had limited knowledge of the intervention.

9. Case Studies

Following case stories have emerged from our interactions with various project stakeholders:

Case Story 1:

Riya (name changed), an 8th standard student at Government Senior Secondary School, Bhoopkheda, was initially hesitant about science. She found it challenging to understand topics within science and often stayed quiet during class. However, she gradually started to develop interest and started finding it easy to understand complex topics with the introduction of STEM Labs at her school. The hands-on learning through the STEM Labs helped her eliminate her fears and participate confidently in class.

As her interest grew, Riya became more active in class and started working on science projects. Motivated by the teachers and with increased confidence, Riya entered the INSPIRE Award competition with a model on rainwater harvesting for which she even won a cash prize of ₹10,000.

The access to STEM Lab in her school helped Riya in turning her hesitation into excitement. It shows how STEM Labs can make challenging subjects interesting and fun, helping students like Riya discover a love for science and achieve great things.

-Student, Government Senior Secondary School, Bhoopkheda

Case Story 2:

Since the setup of the STEM Lab in our school, I have witnessed a noticeable shift in the students interest in Mathematics. The practical, hands-on approach has made teaching much more efficient. Concepts that once took significant time to explain are now grasped quickly, thanks to the visual and interactive models available in the lab.

They students not only understand the concepts better but are also eager to explore further. Many students are taking the initiative to create their own models, experimenting with new ideas and approaches. This newfound curiosity and creativity have made the classroom a more dynamic and exciting place.

Overall, the introduction of STEM Labs has transformed the learning environment, making it easier for teachers to teach and more engaging for students to learn.

– Science Teacher, Government Senior Secondary School, Gandala

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