

ଓଡ଼ିଶା ସଂସ୍ପରଶ



# TO THE FUTURE

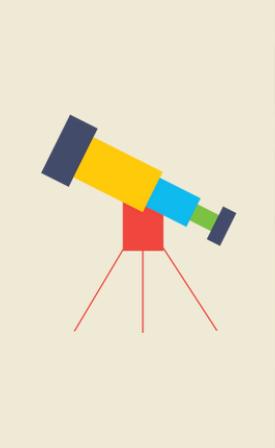
*The Five-Day Journey*



JUNE 7 - 12, 2024



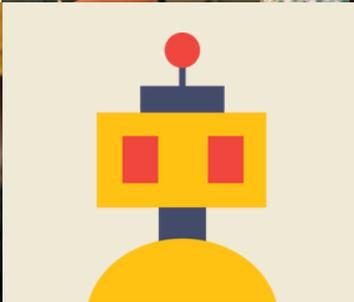
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**27** Students  
**5** Districts

**10** Mentors  
**2** Partner Institutions

**5** Days



# Introduction

## The Road to Hack to the Future: Odisha Edition 2024

Reflecting on the improved access to education, the Ministry of Education in India shares that approximately 82% of children of secondary school age are enrolled in school. However, gender disparities in STEM education persist prominently.

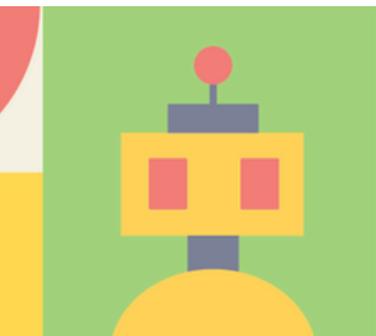
**In India, only about 25% of female students pursue higher education in STEM fields, highlighting significant underrepresentation.**



In Odisha, Quest Alliance, in partnership with the Amazon Future Engineer program, has been working with government secondary schools to enable students to learn coding.

In collaboration with the Mo School Abhiyan Parichalana Sangathan, Quest Alliance has contributed to the development of the Kaushali curriculum, which enables students to develop computational thinking skills. Hackathons were introduced as a key approach, providing spaces for young students to develop skills and think creatively to address global challenges through local innovation. Selected students attended a 20-hour bootcamp to build prototypes, which are later showcased at various forums at the school, district, and state levels.

**In the last three years, 183 student groups have been awarded Rs. 10,000 scholarships by the Inspire Manak team. This engagement is fostering critical thinking among students and empowering them to solve problems and create impactful solutions.**



“This hackathon process has helped me a lot. I am always engaged in these tinkering spaces as part of the ATAL lab in my school and look forward to making more projects in the future.”

**BISWAJIT BAL**  
GOVERNMENT HIGH SCHOOL, MEDICAL CAMPUS,  
GANJAM, ODISHA

# Meet the Hackers!

The hackers are from government secondary schools in the Cuttack, Bhadrak, Ganjam, Mayurbhanj, and Rayagada districts of Odisha. A total of 27 students came together to find solutions to 9 problems and develop functional prototypes. Students had the opportunity to pitch their ideas and inspire the ecosystem to encourage young students to solve local problems using technology.



**27**

Students



**9**

Solutions



# Mentor Speak



"Hack to the Future was a truly unique event, unlike anything I had ever experienced before. It provided clarity on real-life problems and offered solutions with the help of our team. During my school years, I never encountered an event like this."

**TANUSHREE LIPI**

MCA, FIRST YEAR

ODISHA UNIVERSITY OF AGRICULTURE & TECHNOLOGY

"A hackathon is a unique convergence of creativity, collaboration, and innovation, where students come together to tackle real-world problems and transform ideas into tangible solutions within a short period of time. It's a playground for tech enthusiasts, fostering an environment where learning and experimentation are encouraged, and the impossible becomes possible."



**PARTHASARATHI MOHANTY**

IT BRANCH

IIIT BHUBANESWAR



"I had the privilege of mentoring the hackathon for these young minds, and it has been an incredibly rewarding experience. The energy and enthusiasm these young minds brought to the event were truly inspiring. It was amazing to see how quickly they adapted to the challenge and their ability to iterate on their ideas. Many teams were using technologies like Arduino and various software development tools to bring their concepts to life.

I spent a lot of time providing feedback on their designs and helping them troubleshoot technical issues. The dedication and problem-solving skills these students exhibited were remarkable. They were not just creating projects; they were passionate about solving real-world problems. Overall, being a mentor for this hackathon was an enlightening experience. It was a privilege to guide them through this journey, and I have no doubt that many of these young innovators will achieve great things in the future."

**PRINCE PIOUS OMM PRAKASH**

B.TECH IN ELECTRONICS AND TELECOMMUNICATION

ENGINEERING, IIIT BHUBANESWAR

# *Experiences for Students Over the 5 Days*

In the 5-day Hack to the Future: Odisha Edition event, students had the opportunity to work with mentors from Quest Alliance, IIT Bhubaneswar, and Odisha University of Agriculture and Technology, Bhubaneswar. Students worked on building products for the problems they had identified. These products combined the code they wrote with the electrical/electronic hardware they built.

During this five-day journey, students refined problem statements, brainstormed, worked on prototypes, and learned programming using various software. With each session, they navigated the intricacies of design thinking, software development, and the art of presentation. Through hands-on workshops and mentor-led guidance, they sharpened their skills, learned how to tackle obstacles, and pushed the boundaries of creativity to create impressive real-time problem-solving prototypes.

As part of the journey, students also delved into Quest's Career Game, exploring diverse career paths and gaining insights into the exciting possibilities that lie ahead. To experience the real life of an aspirant, they interacted with two industry volunteers: one from Dell and one from Dhvani. Through immersive experiences and engaging discussions, they uncovered their passions, talents, and aspirations, charting a course toward a fulfilling future.

# Cognitive Corners: Exploring STEM Books, Chatbot, Career Game

A cognitive corner was set up, featuring a diverse collection of books in genres like autobiographies, novels, and short stories by various Odia authors. Students had access to both physical books and e-books through the Quest App, along with online storybooks from the Pratham Books Foundation.

In addition to the literary resources, students engaged with Ikki, to learn the basics of coding and computational thinking. This interactive module introduced them to the latest coding concepts in an accessible format.

Moreover, students explored various career options through the Career Quest game. This tool provided insights into different career paths, helping them brainstorm and map out potential future careers for themselves. The combination of diverse reading materials and interactive learning platforms created a rich, multifaceted educational experience.



# Storytelling Session

The session was led by the renowned storyteller Sampad Mahapatra, who captivated the students by weaving captivating tales of kings intertwined with mathematical concepts. He also used various geometric figures as models to narrate the story, helping them understand the underlying concepts of fundamental geometry, algebra, and measurements.



# VR (Virtual Reality)

Students experienced VR for the first time. Both learners and teachers were fascinated by this new technology. Wearing VR goggles and holding joysticks, they were transported to another world, away from their everyday reality. The students' eyes clearly expressed their excitement as they patiently awaited their turn. The exploration of this visual world was not limited to our learners; teachers and mentors also participated eagerly.



"I got lost while playing in this VR and wearing the goggles. At first, I was uncomfortable with the visuals, but then I slowly took note of how it worked. After that, I was all set to play and successfully completed the game."

**JIGYASA JENA**  
SECONDARY BOARD HIGH SCHOOL,  
CUTTACK, ODISHA

# Futures Exhibits

What will the future of education look like? Can future literacy provide hope to today's youth? These questions and more were pondered by students as they engaged with three Futures Exhibits:

## **Classrooms of the Future**

Students engaged in Futures Literacy by envisioning potential future classroom scenarios in Assam, Gujarat, and Odisha for the year 2050. This exhibit invites the viewer to speculate on the significant changes that education may undergo over the next ten years and to consider how these changes will shape the classrooms of the future.

## **Artefacts of the Future**

This exhibit showcases the diverse futures envisioned by students in Futures Literacy workshops across three states, where youths' perception from anxiety to hope, inspiring belief in creating thriving communities in the face of the climate crisis and mitigating its effects.

## **Multiple Futures**

In this exhibit, viewers explore different stakeholders' visions for the future of Assam, Gujarat, and Odisha, where students feel trapped, fearing they lack control over their future, while a predetermined template looms, bringing floods, cyclones, and unemployment. Disruptions to education, healthcare, and livelihoods are inevitable, and they yearn for a future of dignity but feel powerless to shape it.

# 5-Day Plan

## **Introduction and Mentorship**

Participants received briefings on the Ideathon and Hackathon processes, safety measures, and event norms. The "Green" theme was introduced through discussions on local environmental issues. Mentors provided guidance to students in ideation and project refinement.

## **Design Thinking and Technical Skills**

Students learned design thinking principles by creating a table organizer. They gained insights into technology applications through an exhibition and acquired basic software skills relevant to their projects.

## **Practical Coding and Hands-on Challenges**

Students deepened their coding knowledge, explored kit components through challenges, and planned prototype construction. They built tangible models, incorporating feedback from a gallery walk on both hardware and software aspects.



"A journey from complications to solutions is the testament to the power of perseverance and innovation."

**SUBHASHMITA SUTRADHAR**  
PROGRAM ASSOCIATE, QUEST ALLIANCE

# Building Towards Brighter Futures

Over the course of 5 days, students dedicated their time to refining their problem statements and developing prototypes to present their ideas. Split into 9 groups, each with the guidance of a mentor, they delved into maker kits and materials provided, which contributed to the building process. The sessions focused on incorporating play and reflection, allowing for experimentation with new technologies and building confidence in their usage.

Here, you can find an overview of the challenges and solutions discovered by each group, along with reflections on students' journeys.



## Problem Statement

Unstaffed railway crossings lead to frequent pedestrian accidents.

## Solution

An automated railway crossing system, triggered by motion sensors detecting approaching trains, will autonomously close gates upon detection and reopen them once the train has safely passed, eliminating the need for human intervention.

## Reflection

The group noticed issues in their area, including the Bahanaga railway accident and frequent animal and pedestrian casualties on the tracks. This prompted the development of the Automated Railway Guard, designed to detect obstacles in front of trains and improve safety. Despite initial uncertainty, the students learned to use Arduino, IR sensor, and ultrasonic sensor to create the system, overcoming the challenge of working with unfamiliar tools.

## AUTOMATED RAILWAY GATE

Chandrashekar  
Ratnakar Sahayog  
Govt. High School,  
Bhadrak, Odisha

### MENTOR

**Tanusree Lipi**

### TEAM MEMBERS

**Jajnidish Behera**

**Lipsa Rani Parhi**

**Nikita Nayak**



"Teamwork is the bond that transforms individual efforts into a harmonious symphony of achievement, demonstrating that together, we can create something greater than ourselves."

**LIPSARANI PARHI**

CLASS X,  
CHANDRASHEKAR  
RATNAKAR SAHAYOG GOVT.  
HIGH SCHOOL,  
BHADRAK, ODISHA



# Problem Statement

Farmers struggle with precise irrigation, affecting crop water levels.

# Solution

Students crafted a Smart Irrigation System prototype using soil moisture sensors and lights. This system aims to address farmers' water issues by detecting soil moisture levels and activating water pumps accordingly.

# Reflection

In Ganjam district, Odisha, students noticed that villagers rely on agriculture but face water scarcity in summer, hindering crop cultivation. To address this, they proposed a smart irrigation system using soil moisture sensors, a Wi-Fi module, and a hydroponic method. Initially, they faced challenges and sought help from mentors to build a prototype. The system aims to ensure sustainable crop cultivation during the summer.

**FARMER  
SAATHI**

Radha Raman High  
School,  
Ganjam, Odisha

MENTOR

**Anirudh Parida**

TEAM MEMBERS

**Rudramadhab Prusty**

**Jharana Swain**

**Sipra Swain**

”

"The process of creating a table organizer has been instrumental in developing my design thinking, enabling me to explore creativity, functionality, and practicality in a hands-on manner."

**SIPRARANI SWAIN**

CLASS X,  
RADHA RAMAN HIGH  
SCHOOL,  
GANJAM, ODISHA



# Problem Statement

Faulty industrial drainage sends pollutants to rivers, harming ecosystems.

# Solution

Students have installed water sensors in these industrial pipeline to prevent overflow, and filtration systems to clean polluted water before discharge, ensuring water body safety and environmental sustainability.

# Reflection

In Paradeep, an unfortunate incident occurred when an oil tank overflowed, resulting in severe environmental consequences. The overflow led to extensive contamination of nearby ponds, rendering the water unsuitable for agricultural use due to soil contamination. This contamination severely affected fertility, disrupting the local farming community's primary livelihood. The incident not only impacted immediate agricultural output but also presents long-term challenges for soil restoration and ecosystem recovery.

To address this issue, the students built a water purifier using chlorine and alum to treat the contaminated water. They then repurposed the purified water for gardening and vehicle washing. Additionally, the students implemented the use of Watersensor to monitor water overflow.

## SMART AQUASHIELD SYSTEM

Government High  
School Medical  
Campus,  
Ganjam, Odisha

### MENTOR

**Partha Sarathi  
Mohanty**

### TEAM MEMBERS

**Yasir Khan**

**P Aditya**

**Biswajeet Bal**



"Participating in hackathons isn't merely about constructing solutions; it's a journey of exploration and discovery, wherein the process of innovation becomes a pathway to assimilating new ideas and pushing the boundaries of what's possible."

### BISWAJIT BAL

CLASS VIII, GOVT HIGH  
SCHOOL MEDICAL CAMPUS,  
GANJAM, ODISHA



## Problem Statement

Curvy hilly roads cause frequent accidents, especially during times of low visibility.

## Solution

Students created a model with an IR sensor and buzzer to alert drivers in hilly areas, coupled with piped lines for safety, addressing challenges of curved roads and low visibility, improving road safety.

## Reflection

Many accidents have been observed on the Kalinga Ghati road, which connects Ganjam to Phulbani, especially at night. To address safety concerns, students have created a device called the "Ghati Guard." This device is designed to prevent accidents and ensure the safety of travelers and villagers by utilizing Arduino Uno, ultrasonic sensors, DHT sensors, and a buzzer. The students have shown great curiosity and enthusiasm while working with these tools and are eager to explore the detailed workings of the device.

### GHATI GUARD

Radha Raman High School,  
Ganjam, Odisha

#### MENTOR

**Nidhi Parmar**

#### TEAM MEMBERS

**Rabi Narayan Sahu**

**Liza Bisoyi**

**Monalisa Bisoyi**



"Hack to the Future: it's like using creativity and tech to make tomorrow better, with lots of cool ideas and endless possibilities."

**RABI NARAYAN SAHOO**

CLASS X,  
RADHA RAMAN HIGH SCHOOL,  
GANJAM, ODISHA



# Problem Statement

Strangers entering hostel rooms at night without authorization may harass residents.

# Solution

The implementation of a sensor-triggered buzzer system effectively deters unauthorized entry into the girls' hostel, ensuring heightened security measures.

# Reflection

In Rayagada, most schools are residential, with a large number of girls living in hostels. To enhance safety, a device has been developed to detect unauthorized individuals and prevent them from entering the hostels, thereby protecting the residents from potential mischief. Initially, students feel nervous about how to operate the motion sensors, but with the help of mentors and co-mentors, they become confident in using the devices.

## SAFE HOSTELS

Govind Chandra Dev (Zilla) High School,  
Rayagada, Odisha

### MENTOR

**Prince Omprakash**

### TEAM MEMBERS

**Chandini Jani**

**Samikshya Jakaka**

**Palak Mahakud**



"Self-learning and observing: the keys to unlocking a world of knowledge and understanding, where curiosity leads the way to endless discoveries."

**CHANDINI JANI**

CLASS IX,  
GOVIND CHANDRA DEV  
(ZILLA) HIGH SCHOOL,  
RAYAGADA, ODISHA



## Problem Statement

Dry seasons deplete water sources, causing scarcity for agriculture and communities.

## Solution

The rainwater harvesting prototype enables communities to store rainwater, ensuring access for irrigation, livestock, and domestic needs during water scarcity, supplementing dwindling water sources for sustainable usage.

## Reflection

Mayurbhanj is vulnerable to various natural disasters such as water scarcity, groundwater depletion, and poor water quality, all of which have significant environmental impacts. To address this issue, our team has decided to build a water harvesting system. This system aims to replenish groundwater reserves by capturing and infiltrating rainwater, thus helping to maintain the water table and ensure long-term water availability. Importantly, this approach has a low environmental impact and is sustainable, reducing the need for large-scale water infrastructure. The students were excited to explore tools such as water level sensors and raindrop sensors for the first time. With guidance from their mentor, they learned to use these tools effectively.

## AUTOMATED RAINWATER HARVESTING AND MONITORING

Dwarsuni  
Government Girls'  
High School,  
Mayurbhanj, Odisha

### MENTOR

**Subham Gochayat**

**Anusha G**

### TEAM MEMBERS

**Sruti Sriya Giri**

**Mamali Gachhayat**

**Jayshree Jyatirmaee Giri**



"PictoBlox learning and AI software: where creativity meets intelligence, empowering minds to shape the future with innovation and ingenuity."

**SHRUTI SRIYA GIRI**  
CLASS IX, DWARASUNI  
GOVERNMENT GIRLS'  
HIGH SCHOOL,  
MAYURBHANJ, ODISHA



## Problem Statement

Road crossing poses risks for the blind and others due to the absence of visual abilities.

## Solution

An automated Smart Blind stick/belt to assist visually impaired individuals in navigating routes and alerting them to obstacles, enhancing safety for both the blind and nearby pedestrians.

## Reflection

Students have noticed that individuals often face safety challenges when out and about, especially concerning unwanted contact from strangers. In response, they have created a smart belt designed to be worn around the waist during travel to prevent such occurrences. This innovative belt uses ultrasonic sensors, motion sensors, and IR sensors to detect and deter sensitive touches, enhancing personal safety and comfort while travelling.

SAATHI

Dadhi Bamana Jew  
Government High  
School, Pratappur,  
Mayurbhanj, Odisha

MENTOR

**Shubham Kumar**

TEAM MEMBERS

**Dipankar Giri**

**Laxmi Badhuk**

**Jayshree Jyatirmaee Giri**



"New ideas and learnings are the seeds of innovation, nurturing our minds to bloom with endless possibilities."

**DIPANKAR GIRI**

CLASS 9,  
DADHI BAMANA JEW  
GOVERNMENT HIGH  
SCHOOL PRATAPPUR,  
MAYURBHANJ, ODISHA



# Problem Statement

During long car rides, driver fatigue may lead to accidents resulting in severe injury or death.

# Solution

The Anti-sleep detector alerts tired travellers with a gentle shock to wake them up. If the traveller remains asleep, the spectacle connects to the car to stop and prevent accidents. It ensures safety on the road by addressing driver fatigue effectively.

# Reflection

According to their mentors, students have identified that long-distance drivers often face issues such as tiredness, fatigue, anxiety, and falling asleep at the wheel, which can lead to accidents. To address this problem, the students have developed an AI model using an Arduino Uno, high-resolution camera, and tracking system to create an automatic braking system for instances when the driver falls asleep. Throughout the process, the students have learned about Arduino Uno, camera installation, tracking techniques, as well as working with PictoBlox.

## ANTI-SLEEP DETECTOR

Secondary Board High School, Cuttack, Odisha

### MENTOR

**K. Swapna**

### TEAM MEMBERS

**Aditya Prasad Mohanty**

**Jigyasa Jena**

**Smrutimayee Behera**



"I love AI; it's an endless well of knowledge, teaching me so many things and expanding my understanding of the world."

**SMRUTIMAYEE BEHERA**  
CLASS IX, SECONDARY BOARD HIGH SCHOOL, CUTTACK, ODISHA



# Problem Statement

The village lacks proper garbage disposal, resulting in an unsightly environment and health hazards.

# Solution

The students have designed a mobile charging vehicle. They have installed an IR sensor to detect other vehicles, ensuring the safety of the van and preventing accidents. In addition, they have established a charging point using solar panels. This system not only charges the van but also contributes to environmental protection by reducing pollution.

# Reflection

Dumuchai, a village in the Ganjam district of Odisha, lacks proper garbage disposal. The resulting soil, air, and water pollution pose significant public health and environmental risks. To address this, students propose building a garbage disposal van in the village. This initiative aims to enhance the community's quality of life by promoting responsible waste management, recycling, and composting, while also conserving resources and protecting natural habitats through proper waste disposal practices.

## INTELLIGENT WASTE MANAGEMENT

Government Nodal  
U.G. High School,  
Ganjam, Odisha

### MENTOR

**Akash Sinha**

### TEAM MEMBERS

**Anshuman Pradhan**

**Priyagni Pradhan**

**Smrutimayee Behera**



"Learning to drill for the first time has been exciting! My mentor is helping me a lot, showing me new things and making it easier for me to understand."

**ANSHUMAN PRADHAN**  
CLASS X, GOVT NODAL  
U.G. HIGH SCHOOL,  
GANJAM, ODISHA



# Everyone's a Winner!

During the making process, a total of 9 prototypes were created, incorporating various sensor technologies, artificial intelligence, machine learning, and integration of the Internet of Things. An esteemed jury panel, consisting of government experts, CSO members, institution heads, dedicated time to listen to each group's presentation. The presentations emphasized articulating and demonstrating the problem, the process, and the prototype.

We placed emphasis on celebrating the entire process, making everyone a winner. As a result, different groups received the following awards:



Design  
Champions



Inclusive  
Champions



Equity  
Champions



Green  
Champions



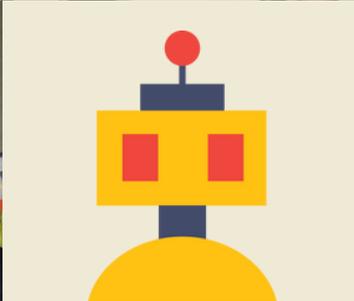
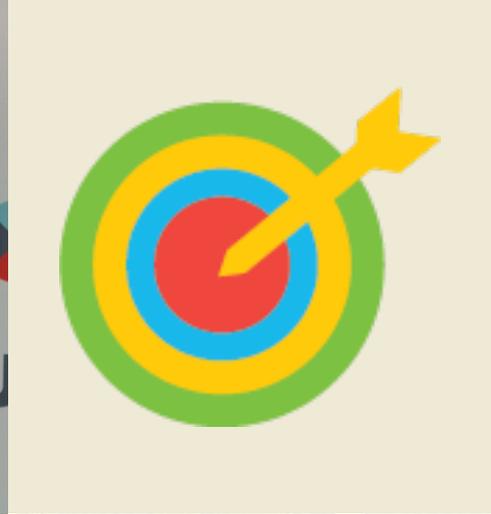
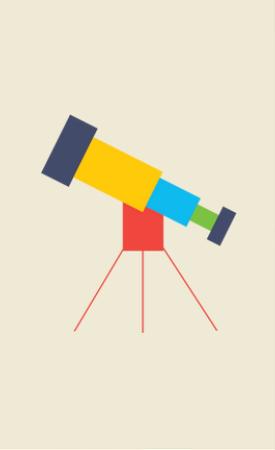
Earth  
Champions



Future-tech  
Champions

# *What's Next?*

- Learners will have the opportunity to participate in the Inter-state hackathon to further build on the product, with the event to be organized in Bangalore, India.
- They can explore opportunities for further development through mentorship programs, incubators, or partnerships with industry experts.
- Learners will have the chance to gain recognition through awards, scholarships, and media exposure.





Quest Alliance is a not-for-profit trust that equips young people with 21st century skills by enabling self-learning. We design scalable solutions that enable educators to address critical gaps for quality education and skills training. We facilitate learning networks and collaboration to bring about systemic change fuelled by research and innovation.

## Contact Us

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