

Building an EcosySTEM

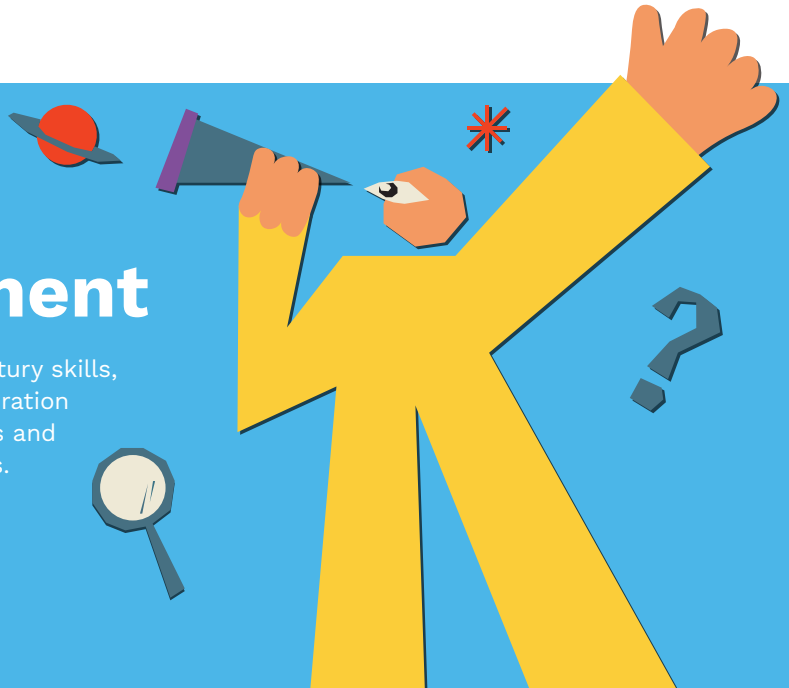


WHAT WE DO

Since 2022, in collaboration with Morgan Stanley, Quest Alliance's EcosySTEM project is pioneering a schools-based initiative to seamlessly integrate STEM mindsets and 21st-century skills, including computational thinking, into government secondary schools. The project also champions on bridging gender gaps in STEM careers with a targeted strategy on:

Learner Empowerment

Equipping learners with 21st-century skills, STEM mindsets, and career exploration tools to make informed decisions and chart successful career pathways.



Gender Sensitization

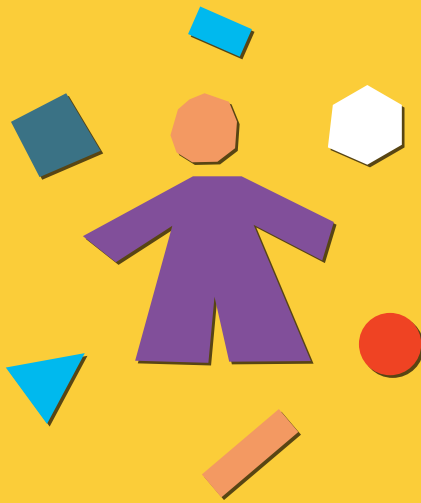
Breaking down gender norms and empowering students, especially girls, to overcome barriers in pursuing STEM careers. We aim to:

- Increase awareness among girls about STEM's potential for economic growth and gender-inclusive innovation.
- Challenge stereotypes hindering girls' pursuit of STEM pathways.



Technology Access

Ensuring equal access to technology, especially for girls, through hands-on experiences with tech kits. We aim to boost confidence in technology use for self-learning, creation, and problem-solving.



Ecosystem Strengthening

Creating a supportive environment involving teachers and parents to foster holistic development. Providing tailored support to students from single-parent or no-parent households, offering them guidance on careers, scholarships, admissions, and addressing logistical hurdles to higher education.

We are glad Morgan Stanley joined us to help young learners in government high schools have the resources and opportunities to explore and shape their futures. Through this collaboration, we've reached out to:



3,168
Learners



233
In-depth
Pathway
students



29
Educators



6
Schools

HOW WE DID IT

April 2022

Implementation begins in 6 select schools in Bangalore.

July 2022

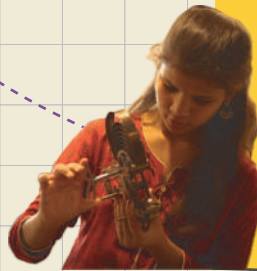
Teacher and Headteacher orientation conducted in all schools.

September 2022

Student sessions kick off, focusing on self-awareness.

October 2022

Gender Module sessions and ideathon begin and open conversations about understanding and challenging stereotypes. Computational Thinking sessions begin via ideathon, hackathon, and zine-making for creative problem-solving. **1000+ students** in Ideathon, **300+** in Hackathon.



December 2022

200 in-depth pathway students were selected for comprehensive support with tabs to access digital curriculum; and career guidance, including a toll-free helpline for them to inquire about colleges and courses; psychometric assessments, and scholarships. **50 of these students** and **30 parents** participated in a residential hackathon camp for hands-on learning and peer collaboration.



December 2022 - January 2024

Career sessions rolled out: **945 students** created career cards that helped them dive into their aspirations, research skills and educational requirements to pursue careers of their choice. Role Model Interactions brought professionals from STEM and related fields to the classroom to interact with students, share their stories, and talk about their career journeys.

December 2022

Volunteering: **40 Morgan Stanley volunteers** hosted classroom interactions, shared interests, and taught students to code on SCRATCH.



December 2023

Students from the in-depth intervention visit a National Skills Training Institute to explore diverse skilling pathways.



December 2023

The second cohort of students for the in-depth intervention is selected.

September 2023

2 Model schools established with STEM Clubs encouraging **60 STEM Champions**.

February 2024

At the Advanced Build Inter-State Hackathon, 9 students deep dived into challenges and built working prototypes and products with digital fabrication, power tools, laser cutting, electrical wiring, 3D printer and more.

June 2023

Self-curriculum sessions begin, enabling students to reflect on values, aspirations, and professional goals.

February 2024

Share-out event across schools showcased students' learning. Students wrote essays, poems, and performed skits, fostering a fun, creative exchange.

May 2023

Year 2 begins, marking our continued commitment to project goals.

April 2023

6-day summer camp equips **9 students** with advanced Python coding skills.



February 2023

School-level share-out events showcase students' learnings under EcosySTEM.

February 2023

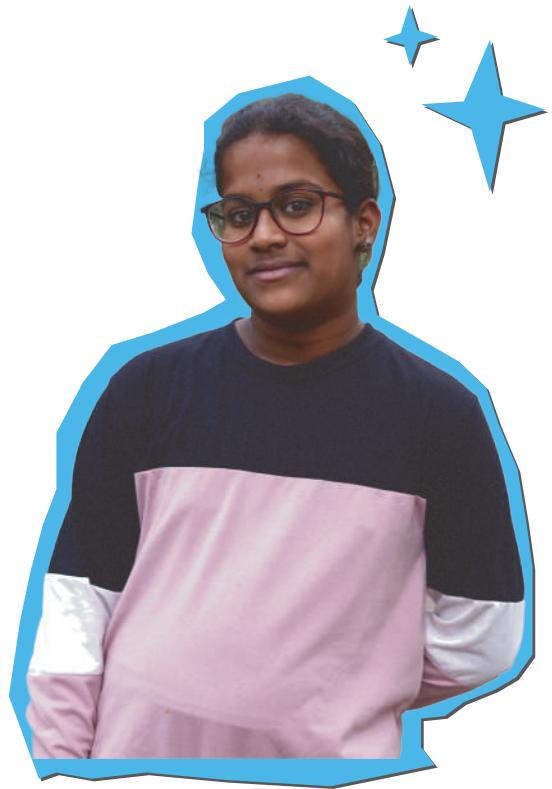
At the interstate hackathon called Hack to the Future, **3 students** were recognized as Tech Champions for the innovative prototypes they built.

Priyashree Dreams of Using STEM Skills to Spark a Fashion Revolution

PRIYASHREE REDDY
CLASS 8
GOVERNMENT GIRLS' HIGH SCHOOL,
HOSKOTE, KARNATAKA

At 13, Priyashree is determined to become a fashion designer, blending science, technology, and fresh ideas to create stylish and comfortable attire—essentially turning STEM into STEAM (Science, Technology, Engineering, Arts and Mathematics). Currently enrolled at Government Girls' High School in Hoskote, she hasn't yet had the chance to attend a fashion show, only catching glimpses through videos, but this has left a lasting impression on her.

Despite the financial challenges arising from her parents' losses in their milk business during COVID-19, Priyashree smoothly transitioned from a convent school to a government one, swiftly rising to the top of her class. Fluent and eloquent in English, Priyashree recognizes its significance in today's global landscape. This futures-thinking mindset led her to join the EcosySTEM program, led by Quest Alliance in collaboration with the Karnataka Residential Educational Institutions Society.



Deciphering the Logic Behind How Things Work

Previously, girls were discouraged from exploring science and technology, which were considered domains reserved solely for boys. However, there has now been a shift, with many girls in her class, including Priyashree herself, now showing interest in these fields.

During the hackathon, Priyashree and her classmates engaged with various ideas, thoughts, and concepts through interactions with guides, mentors, and education activists. This opportunity to interact with her classmates and peers from other schools provided Priyashree with an opportunity to learn self-assessment skills and cultivated a spirit of cooperation.

Over the course of two days, they explored designing functional models using electric circuits, gadgets, sensors, motors, and pumps to address identified problems. Priyashree and her team of four girls, focused on developing a garbage clearance system using sensors and alerts to streamline garbage collection and clearance from temples in the region. They also explored methods for producing manure from plant waste and came up with a design idea which involved collecting discarded flowers from temples, drying them, and mixing them with cow dung and soil to create fertilizer for plants and gardens.

With a strong curiosity about how things work, Priyashree eagerly anticipates applying the methods she learned during the course to her passion for fashion design.

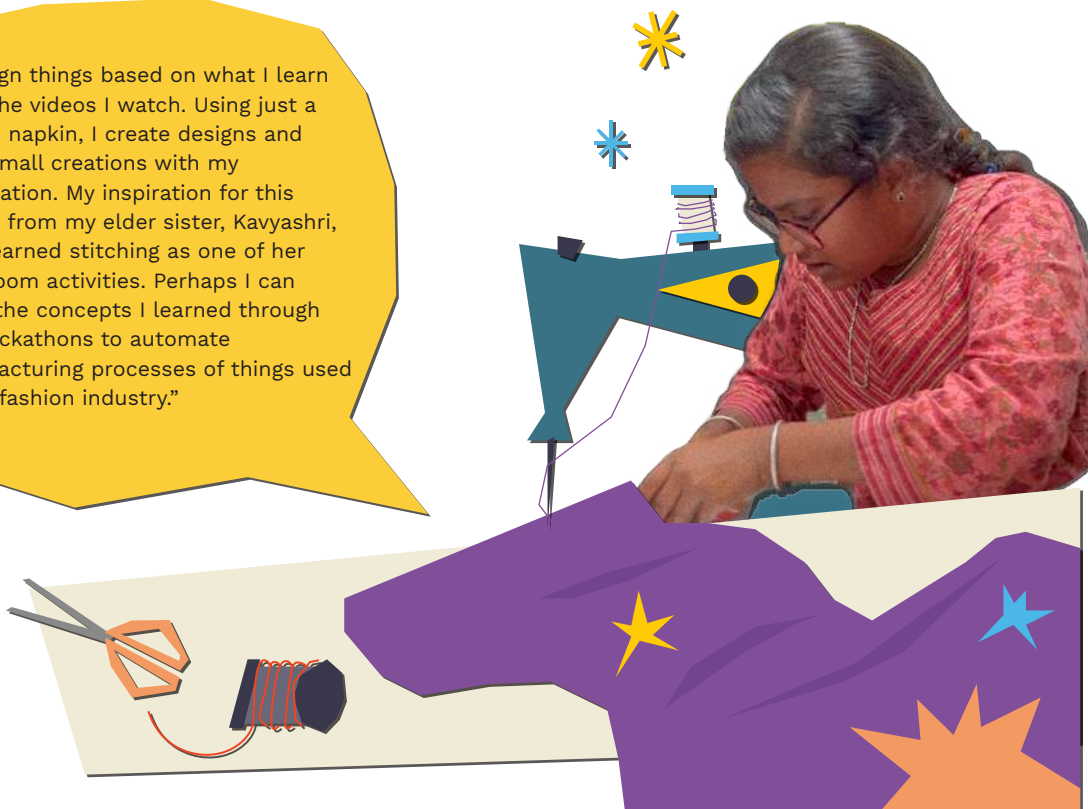
Empowered by the program's emphasis on nurturing their critical thinking skills, Priyashree started questioning and

challenged the unequal rules for boys and girls enforced by her parents at home. As she honed her reasoning skills and actively immersed herself in both school and extracurricular activities, her parents started listening to her and granted her more freedom.

Dreaming Big, Priyashree Wants to Design for Silver Screen Icons

As she grows up, Priyashree dreams of dressing the heroes and heroines of the film world, inspired by her favourite Telugu movie stars like Allu Arjun and Sai Pallavi. Having learned the value of cooperation, learning, and innovation through the program, she pledges to continue experimenting with STEM and fashion until she finds her path forward. She continues being passionate about transforming STEM into STEAM (Science, Technology, Engineering, Arts and Mathematics) to design contemporary, cozy, and chic clothes!

“I design things based on what I learn from the videos I watch. Using just a simple napkin, I create designs and craft small creations with my imagination. My inspiration for this comes from my elder sister, Kavyashri, who learned stitching as one of her classroom activities. Perhaps I can apply the concepts I learned through the hackathons to automate manufacturing processes of things used in the fashion industry.”



Can STEM Education Empower a 13-Year-Old to Reject Child Marriage?

NANDINI KUMARI
CLASS 8
GOVERNMENT GIRLS HIGH SCHOOL,
HOSKOTE, KARNATAKA

Born into a migrant family in Bengaluru, 13-year-old Nandini harbours a deep fear of being married off if she ever returns home to her village in Bihar for her holidays. This fear serves as a poignant reminder of the widespread child marriage customs in rural Bihar, where migrant children like Nandini are reluctant to visit their hometowns even during their annual holidays.

Will Nandini dare to dream of a future free from the pressures of child marriage?



Nandini's Parents are Embracing a New Mindset

As Nandini immersed herself in her school studies and joined the EcosySTEM project promoting STEM education for girls and essential 21st-century skills, her fears began to change. The program encouraged her to think critically beyond traditional boundaries, while also emphasizing hands-on learning methods. The two-day hackathon especially, made a significant impact on Nandini's parents, especially her dad, who was one of the few fathers amidst a sea of mothers. The workshop catered to both students and their parents - while the students were engrossed with their mentors and subject experts, the parents were engaged with experts providing insights into effective parenting, crucial for shaping their children's educational journey. Nandini's mother noted a shift in perception among parents from marginalized economic backgrounds regarding the value of education, particularly in professional fields like science and technology.

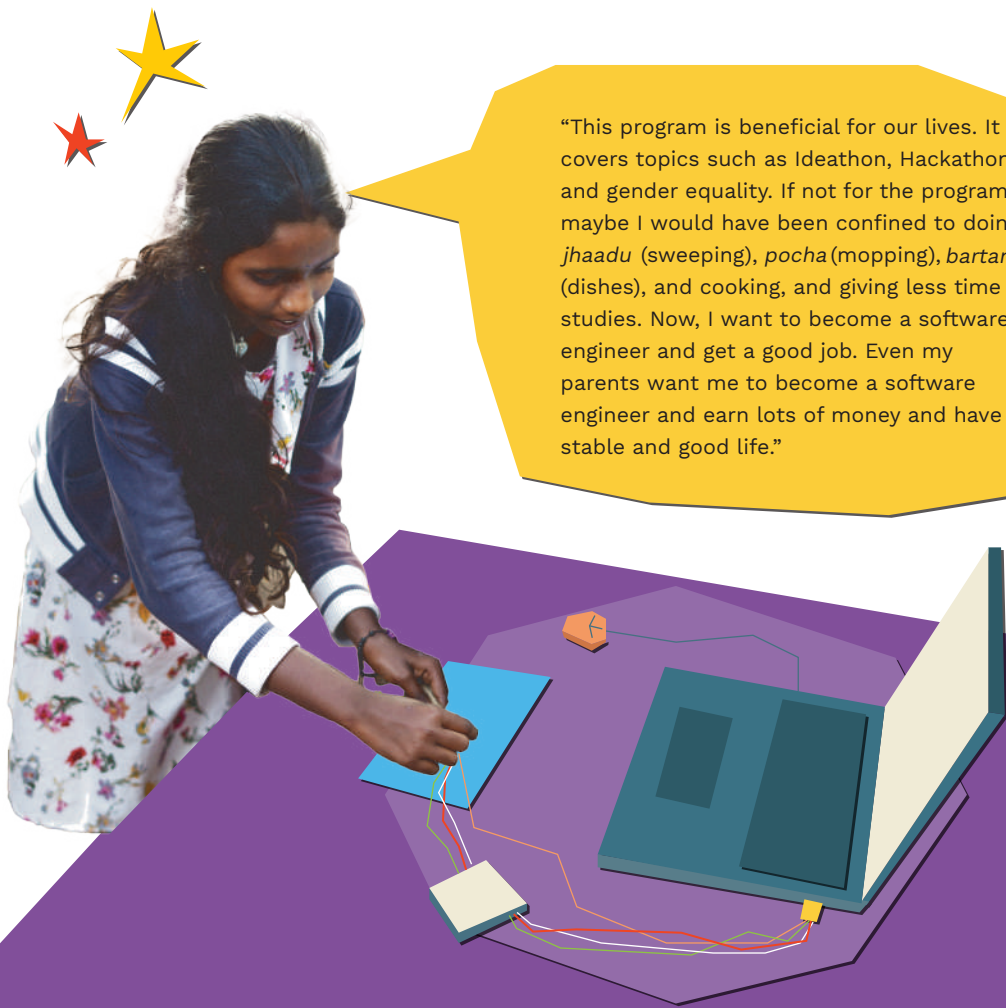
Previously, these opportunities were primarily associated with boys, but there's now a noticeable change in mindset. This change is more evident in parents like Nandini's, who simply want the best for her but are uncertain about what that path looks like. With the guidance and support of her mentors and teachers, Nandini also she gained confidence in her abilities and became more assertive, challenging conventional gender norms.

Within just four months of being in the program, Nandini soon gathered more the courage agency to confront her parents about the issues that bother her like the unequal treatment she receives at home compared to her brother. She also successfully convinced them to abandon the idea of marrying her off and prioritize her education instead.

I Have a Promising Future as a Software Engineer

She now has a strong passion for physics and dreams of pursuing a career as a software engineer. Her parents have also begun to rally behind her academic aspirations, having received counselling from project facilitators regarding their child's potential. Now aware of the impact software engineers can have on society, they wholeheartedly support her ambition to pursue a career and achieve financial stability.

Nandini's happiness has slowly blossomed as her parents are now promoting equality within their household by holding her younger brother accountable for his actions and encouraging him to help with household chores. Though her anxiety about marriage still lingers, there's hope that this too shall pass as her parents' beliefs show promising improvements.



“This program is beneficial for our lives. It covers topics such as Ideathon, Hackathon, and gender equality. If not for the program, maybe I would have been confined to doing *jhaadu* (sweeping), *pocha* (mopping), *bartan* (dishes), and cooking, and giving less time to studies. Now, I want to become a software engineer and get a good job. Even my parents want me to become a software engineer and earn lots of money and have a stable and good life.”

Raju Dreams of Empowering Others Through His Own Success

RAJU
CLASS 9
GOVERNMENT HIGH SCHOOL,
BEGUR, KARNATAKA

Hailing from Yadgir in North Karnataka, Raju has always dreamed of a world where everyone, regardless of their circumstances, has their basic needs fulfilled. While his parents work in the informal sector to make ends meet, Raju and his younger brother faithfully attend school each day. Some days, when Raju's parents' income falls short of covering utility bills, they turn to his aunt and uncle for assistance in managing their expenses. As the older sibling, Raju shoulders a significant burden, which is why he relinquishes his desires to avoid adding to the family's load. It is precisely this sense of responsibility that fuels his desire to succeed and improve his family's financial situation.

Can you imagine the weight of responsibility he bears?



In the classroom, Raju has a strong passion for Humanities, yet he encounters difficulties with Mathematics and Science, struggling to connect with the teaching methods. Still, he pushed through and managed to scrape by with passing grades, but he longed for a deeper understanding. As luck would have it, the EcosySTEM project, led by Quest Alliance in collaboration with Morgan Stanley, entered Raju's life and helped broaden his horizons beyond traditional classroom lessons.

Raju Learns That He Can Use Technology to Uplift Others

Through the Inter-state hackathon in February 2023, he and his peers were encouraged to devise solutions for everyday problems through ideation, experimentation, and hands-on tinkering. He was particularly intrigued by the Green Ideathon process, where Junk Journals, books that students create from waste and

scraps collected from the outdoor environment, are used as a tool for addressing environmental problems. The experience also broke cultural barriers and exposed him to diverse perspectives as he interacted with students from various states such as Bihar and Nagaland, helping him empathize more with the lived experiences of others.

“After the hackathon, I'm still learning more about technology and thinking about what I've picked up. I'm really excited to keep exploring new concepts and methods. I want to share what I learn about technology with my community. I now firmly believe that 21st-century skills have the potential to change things for people like me. Before this project, I didn't really think much about gender equality or technology. I used to think girls weren't as smart as boys and sometimes blamed them for things. But now, I know better and I see everything differently.”



With a strong passion for empowering others, Raju and his team were deeply concerned about the demanding nature of farming, where farmers often toil around the clock to monitor soil moisture levels. Understanding these challenges, they came up with a design solution during the hackathon: a soil moisture level detector and automatic water dispenser for farmlands. The device, following a holistic design approach, would make use of a reservoir-like construction in farmlands. It would activate when moisture levels decrease and automatically switch off after the moisture level rises, eliminating the need for farmers to venture into the fields at night.

Raju Eagerly Awaits the Opportunity to Give Back

While Raju's family advises him to pursue a government job, he's also exploring opportunities in sports or education sectors, maintaining an open mind about his career aspirations.

Through the project, he has realized that there are endless possibilities. His ultimate goal is to achieve financial stability and repay the support he received from people like his parents, uncle, and aunt over the years. Driven by a profound desire to support his family, Raju is determined to start by securing a part-time job when he pursues higher education.



From Rural Bihar to Bengaluru: A 14-Year-Old Girl's Big City Dreams

SUSHMITA
CLASS 8
GOVERNMENT GIRLS' HIGH SCHOOL,
HOSKOTE, KARNATAKA

As a recipient of the in-depth intervention program, part of the Morgan Stanley EcosySTEM project, Sushmita, child of a Bihari migrant worker, is on the right track. Her interest in science and technology, and her curious and inquisitive mind, is what can propel her to professional success.



Sushmita comes from a working-class family that made the challenging move from rural Bihar to Bengaluru, seeking better opportunities and a brighter future for themselves. Currently attending a government school, she is supported by her hardworking parents who labour diligently at a nearby factory, all in pursuit of paving the way for her education.

Her father, in particular, serves as her biggest cheerleader, continuously encouraging her to pursue her studies for as long as he has the energy and financial means to support her as he recognizes the transformative power of education. Although he once dreamed of her entering the civil services as a collector, he now values her autonomy and wishes for her to chart her own path.

Sushmita Unearths Her Passion for Innovation

Always a curious and inquisitive child, Sushmita's fascination with science and technology led her to participate in the EcosySTEM project. During the residential hackathon, she unearthed her passion for innovation as her team decided to take up the issue of disappearing birds, exploring the various factors contributing to their decline. Their research revealed that many birds met their demise due to electric shocks. In response, they designed a device to warn birds away from dangerous wires and towers, potentially saving them from harm.

Sushmita is Ready to Conquer the World

During the hackathon, the facilitators addressed Sushmita's parents' concerns and engaged in in-depth discussions about their children's future and capabilities. Sushmita's father expressed faith in the program, stating, "I am now confident that they will take good care of Sushmita, and that she will have a good future." He promised to continue working in Bangalore and not consider returning home anytime soon, patiently waiting for her education to be completed.

Sushmita now dreams of becoming a doctor and studying abroad. Fueled by her passion for science, she is prepared to face the long road ahead. Her story mirrors the common narrative of many migrant children with big city dreams, who might not have the chance to nurture their potential if not for such interventions. With her parents by her side, she is determined to seize every opportunity that comes her way.

"I appreciated the chance to work with different tools and electronic gadgets, experiences I'd never had before. What struck me during our discussions was how the teachers created an environment where we felt free and encouraged to brainstorm solutions, crafting machines or devices to tackle the identified problems. Earlier, I attended the program out of curiosity, but as I began to understand and enjoy what we were being taught, I started looking forward to the sessions. Now, I don't miss a single class and fully trust the program team."



Want to know what Bhavana thinks of the EcosySTEM project?



Meet Bhavana, a vivacious and chatty student at Government High School, Garudacharpalya, Bengaluru Urban, Karnataka, who found herself thriving through the EcosySTEM project. Through the initiative, Bhavana not only honed her decision-making skills but also gained a deeper understanding of herself and broadened her perspective on gender equality.

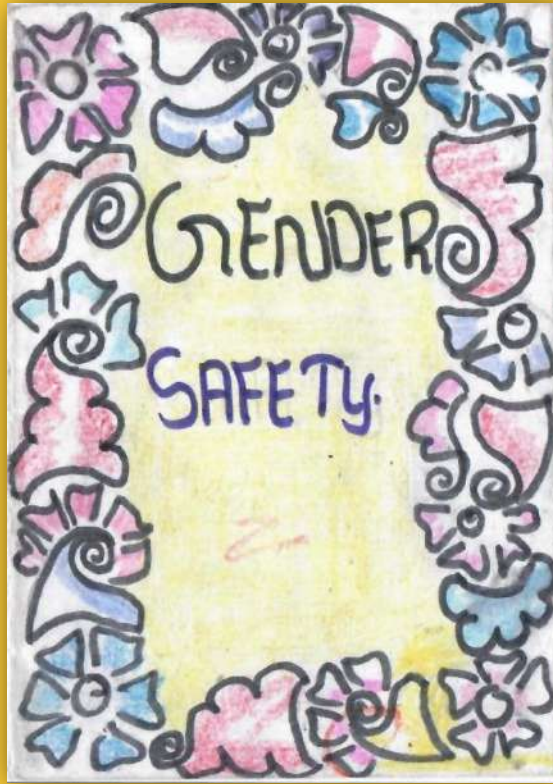
Previously confined to the pages of textbooks, Bhavana now leverages resources like the Quest App to explore essential life skills beyond just academics. With newfound confidence, she has also overcome her doubts about passing her Class 10 board exams and aspires to excel academically.

While she once felt confined by traditional career choices, Bhavana now prioritizes her happiness and dreams of becoming a teacher or an actor! Learn more about her journey by scanning the QR code below:



**PUSHING
THE
BOUNDARY
ON
GENDER &
SAFETY
CAREER
FREEDOM**





Deconstructing Gender Stereotypes

A ZINE ON DISPARITIES FACED BY MEN AND WOMEN

An example is illustrated through this zine, highlighting the societal norm dictating that "men don't cry." This narrative explores the emotional constraints imposed on men and the impact of it on mental wellbeing. The zine further addresses the issue of body shaming experienced by women, exposing the societal judgments and restrictions surrounding their clothing choices.

Zine by:

Chandini, Rabiya, Srikanth, Praveen, Harish

Class 8, Government Junior College J.C. Nagar, Bengaluru, Karnataka

We should
 not weese
 the shot
 diseases

 We should
 not go to
 in night times

We should weese
 the Dupata.

 our society sends
 the girl away to
 another's House by
 giving her 5% doxy
 The remaining 95%
 of the property
 is ruled by the
 son, the heir of
 the Family

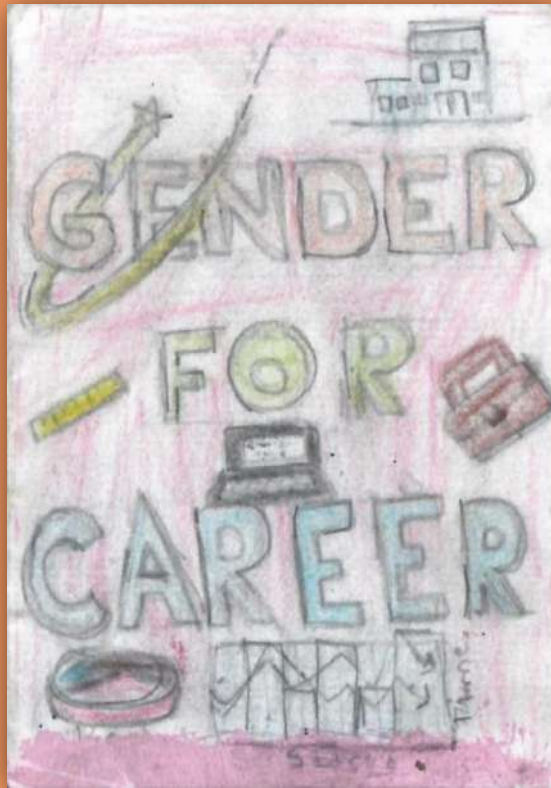
Men don't cry
 Because woman
 have monopoly
 over the tears.
 Because emotions
 are just another
 covers up for
 weakness well
 guess what wen
 Kevin failed in
 5th grade he

didn't cry when
 Kevin's mother
 left him he didn't
 cry. when Kevin
 committed suicide,
 he wondered
 who would cry.

 one girl is glem
 and beautiful
 so all are like
 him

and another
 girl is fat and
 agli so all
 are don't
 like him.

Girls are not
 allowed to see
 their hairs and go
 out because of
 ghosts.



Breaking Boundaries

CHALLENGING GENDER NORMS

This zine emphasizes on gender-related challenges in career and education. In certain villages, girls face significant obstacles to pursuing education, with limited access to proper learning environments. The workplace reality for women unveils another layer of disparity, as racial discrimination prevails in some offices, hindering career growth. Furthermore, the instances of trends that unfolds as women who choose to work often face unequal pay compared to their male counterparts. The zine also explores the unsettling practice of removing married women employees from their jobs due to pregnancy-related absences and also restricting women from going to work post-marriage.

Zine by:

Abhishek

Class 9, Government Junior College, J.C. Nagar, Bengaluru, Karnataka

In some villages girls are not allowed to study properly.



Some parents are worried or don't allow their girl child to work.



After marriage women are not allowed to go to work.



Married women employees are removed from their job due to absence during pregnancy.

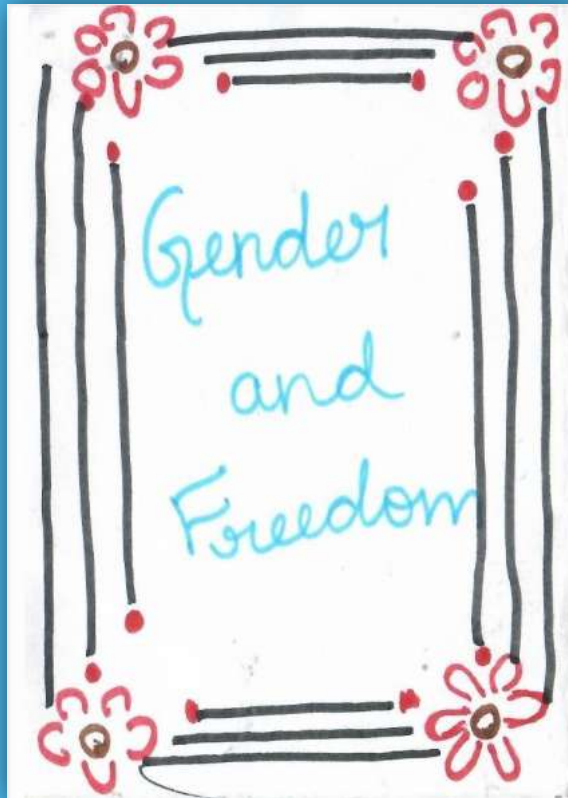


Women are paid less salary than men.



Women are discriminated due to race in some office.





Gendered Perceptions of Safety and Opportunity

FIGHTING DISCRIMINATION TO EMPOWER WOMEN'S FREEDOM

This zine explores the belief that it is inherently dangerous for women to go out, drawing attention to the stark contrast in opportunities provided to girls and boys. The student gives an example where a girl expressing a desire to go outside is met with restrictions due to possible assumed danger, while her male counterpart is encouraged when expressing an interest in joining a sports academy. This example highlights the discriminatory nature of societal expectations, leading to limited opportunities for girls.

The zine challenges these entrenched norms, urging society to reevaluate the stereotypes that contribute to gender-based discrimination. It advocates for equal opportunities for girls, fostering an environment where they can pursue their interests and aspirations without fear or restriction.

Zine by:

Students of Government Junior College, J.C. Nagar, Bengaluru, Karnataka

Mom shall I go to play with my friends



No, it is dangerous to you. So that don't go outside

Oh, my son but be carefully



Mom shall I go to sports academy on Monday

Why we should not allow the girls to outside



Why we should allow the boys to go outside



Solutions For Freedom of Girls

* Girls should be limit with boys.

* Girls should have good friends

* Girls should have equal rights like boys

* Then girls can be freedom in society.

* Why girls have to married with in 25 age. Why not boys.

THE WAY FORWARD

Moving forward, the project will take the following steps:



Provide classrooms with access to resources and tools that promote the practice of 21st-century skills and STEM ways of thinking.



Co-facilitate these activities with teachers, while building their capacity to understand the importance of fostering STEM mindsets and 21st-century skills in their students.



Enhance the teachers' ability to sustain these initiatives in their schools, while promoting learner engagement.

These steps will help achieve the project's goals and create a more engaging learning environment for students, while also empowering teachers to support their students' growth and development in STEM and other 21st-century skills.

We bring over 15 years of experience in transforming education across India. Partner with us to address critical gaps in the education system, provide young learners access to 21st-century skills, and build capacities of government schools.

If you want to support impactful, innovative, technology-enabled programs for learners and educators, our Schools program offers:

Transparency

Data-driven reporting and analytics dashboards to view youth impact and project outcomes.

Expertise

End-to-end project management and support from our experienced team of professionals. Large scale, technology-enabled programs with a focus on quality.

Leverage

Use existing Quest knowledge in technology, design, media and content to tailor unique offerings. Cross-donor leverage across different Quest funding partners, adding sustainability, scale and stability to all schools impact initiatives.

If you'd like to fund, volunteer, or support this program in any way, write to us at info@questalliance.net



No-222, Good Earth Malhar
Avenue, Kambipura, Kengeri,
Bangalore – 560060

+91 63617 51652
+91 86187 95738

Connect With Us



[@questalliance](https://www.instagram.com/questalliance)

www.questalliance.net

info@questalliance.net