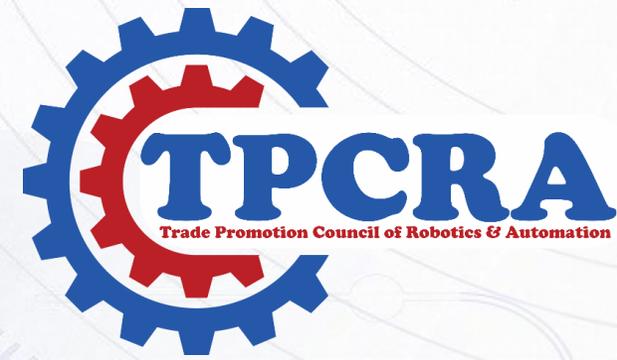


Trade Promotion Council of Robotics & Automation

State STEM Implementation Program

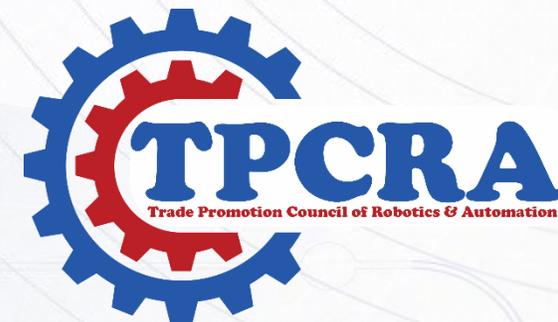


Who we Are



Trade Promotion Council of Robotics & Automation (TPCRA) is the not for profit apex body representing Robotics and Automation and Information Technology sector. TPCRA is recognized by both the Government, as well as the industry, for its role in the growth and development of the Robotics and Automation and Information Technology sector. At TPCRA, we believe that technology is the primary contributor of economic growth and with our consistent policy advocacy efforts, we have emerged as a strong and effective industry mouthpiece, within government corridors.

Headquartered in New Delhi, and with key affiliates across the globe, TPCRA offers a wide range of programs and services to Robotics and Automation Sector as well as the entire ICT industry across the Globe. These initiatives include organizing various exhibitions, conferences, seminars, training sessions, and workshops; policy representation; domestic & international marketing support; technology initiatives; publishing industry related information in targeted publications; networking opportunities; and many other industry-directed services.



Indian Education Industry Analysis

India's education sector offers a great opportunity with approximately 29 per cent of India's population being between the age group of 0-14 years. India's higher education segment is expected to increase to Rs 2,44,824 crore (US\$ 35.03 billion) by 2025. The education sector in India is estimated at Rs 6,40,891.3 crore (US\$ 91.7 billion) in FY18 and is expected to reach Rs 7,06,587.9 crore (US\$ 101.1 billion) in FY19. Increasing internet penetration is expected to help in education delivery. As of December 2018, internet penetration in India reached 46.13 per cent. As of March 2019, there are 66 million internet subscribers in India in age bracket of 5 to 11 years.

India has over 250 million school going students, more than any other country. It also has one of the largest networks of higher education institutions in the world. Number of colleges and universities in India reached 39,931 and 993, respectively in 2018-19. India had 37.4 million students enrolled in higher education in 2018-19. Gross Enrolment Ratio in higher education reached 26.3 per cent in 2018-19. In December 2018, the government of India published that 3.43 million candidates had enrolled in the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 2016-20 scheme. Up to January 24, 2019 as many as 2.52 million candidates were trained under the scheme's Short-Term Training (STT).

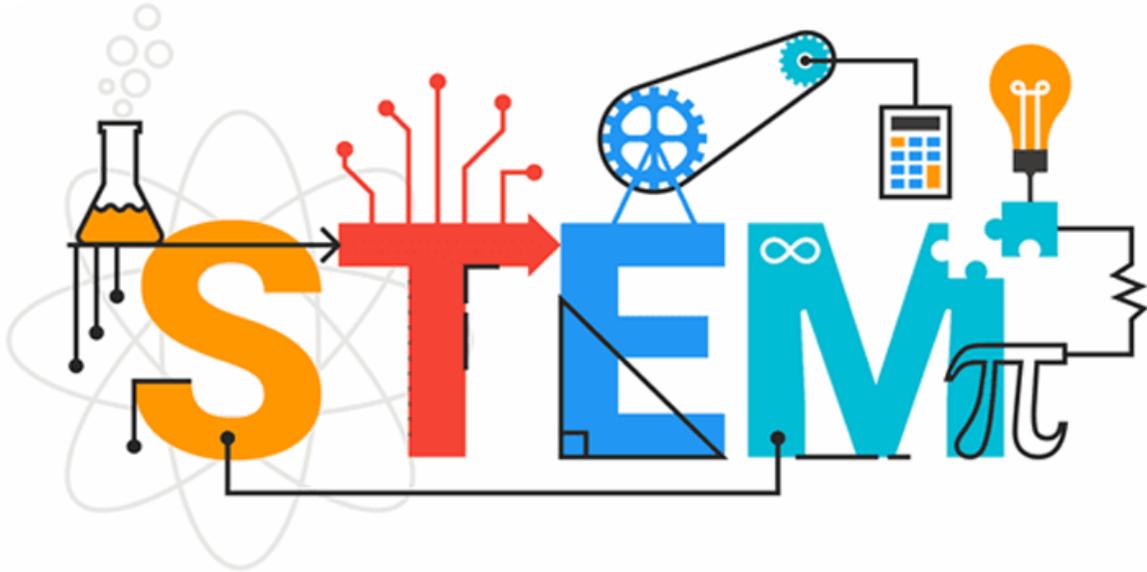
The Central Government plans to disburse US\$ 1 billion to states for introducing skill development initiatives. In November 2016, Ministry of Skill Development and Entrepreneurship launched Pradhan Mantri YUVA Yojana, at a cost of Rs 521.93 crore (US\$ 74.68 million) for providing entrepreneurship education and training to students in the country. Skill India Mission 2015 aims at skilling 400 million Indian youths by 2022. As of December 2018, there were 15,044 Industrial Training Institutes in the India. In October 2017, in order to boost the Skill India mission, two new schemes, SANKALP and STRIVE were launched with an outlay of Rs 6,655 crore (US\$ 1.02 billion). Revitalising Infrastructure and Systems in Education (RISE) by 2022 was announced in union budget 2018-19 with an outlay of Rs 1 lakh crore (US\$ 15.44 billion) for four years. Skill India program has benefitted more than one crore (10 million) youth annually. Under the Union Budget 2019-20, government provided Rs 400 crore (US\$ 57.23 billion) for 'World Class Institutions.' According to the Union Budget 2019-20, government has proposed a 12.8 per cent year-on-year increase in FY20 allocation of Rs 56,536.36 crore (US\$ 8.09 billion) for school education.

Education sector in India remains to be a strategic priority of the government. The Government of India has allowed 100 per cent Foreign Direct Investment (FDI) in the education sector through the automatic route since 2002. The sector has received cumulative FDI worth Rs 17,262.83 crore (US\$ 2.47 billion) up to March 2019. Indian education sector witnessed 18 merger and acquisition deals worth Rs 342.4 crore (US\$ 49 million) in 2017. In private equity and venture capital funding, education industries companies are expected to attract US\$ 500 million by end of 2019. In May 2018, the Ministry of Human Resource Development, Government of India launched Samagra Siksha scheme with the aim of achieving holistic development of school education in the country. As per Government of India, New National Education Policy to transform India's higher education system to one of the global best education systems very soon. In August 2019, Maharashtra International Education Board (MIEB) has signed a collaboration agreement with Google India.

As per the Union Budget 2019-20, under the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA), over 2 crore rural Indians have been made digitally literate.



Background



STEM Education, known for its focus on Science, Technology, Engineering and Mathematics is relatively a new term in the Indian education sector.

A robust STEM education creates critical thinkers, problem-solvers, and next generation innovators. Taking into consideration that India is one of the countries that produces the highest number of scientists and engineers; the growth of STEM has picked up significantly over the last few years.



STEM – At a Glance

STEM is a growing movement in education around the world. STEM-based learning programs are intended to increase students' interest in pursuing higher education and careers in those fields. STEM education typically uses a newer model of blended learning that combines traditional classroom teaching with online learning and hands-on learning activities. This model of blended learning aims to give students the opportunity to experience different ways of learning and problem solving.

STEM Science

Classes in the science category of STEM programs should look familiar and include biology, ecology, chemistry, and physics. STEM science classes incorporate technology, engineering, and math into scientific studies.

STEM Technology

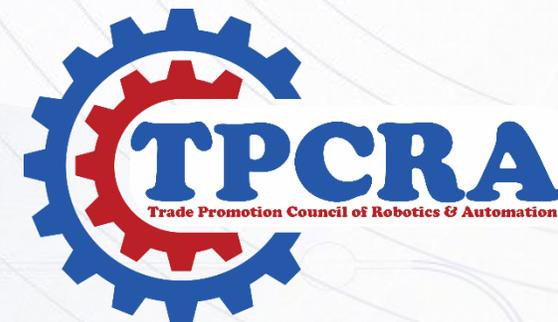
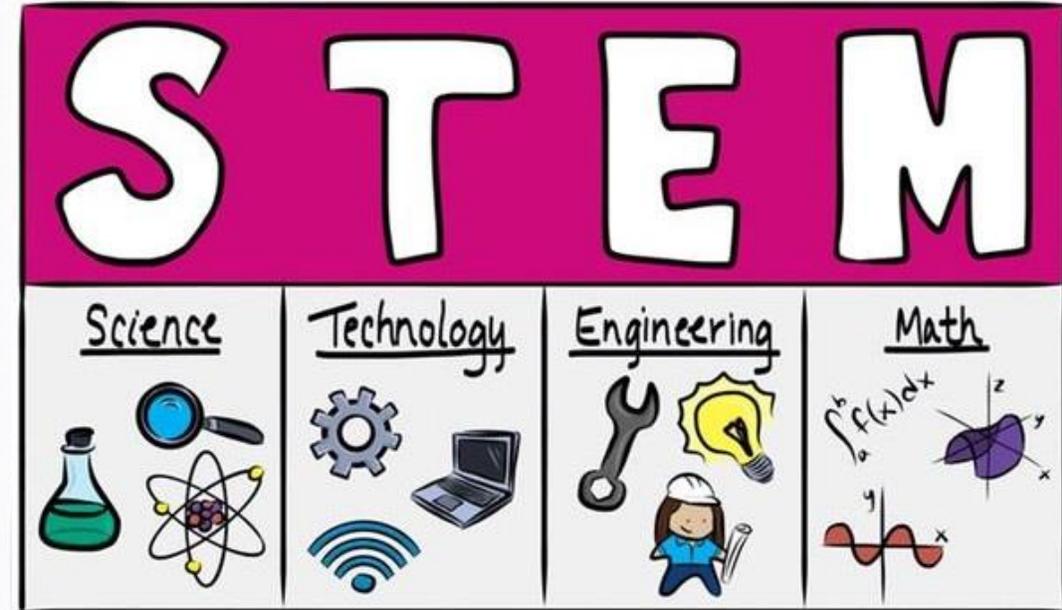
For some parents, the closest thing to technology classes may have been playing learn-to-type games during occasional computer lab sessions. Technology classes have definitely changed and may include topics like digital modelling and prototyping, 3D printing, mobile technology, computer programming, data analytics, Internet of Things, machine learning, and game development.

STEM Engineering

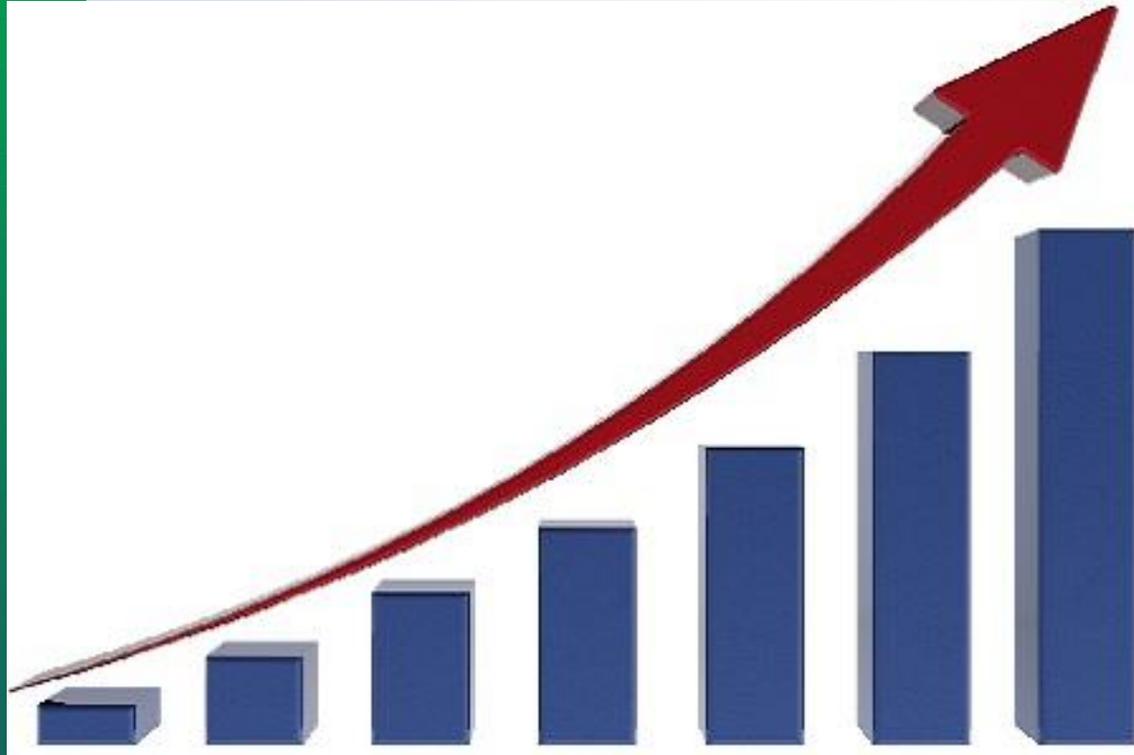
Much like technology, the field and scope of engineering has grown considerably in the last few decades. Engineering classes might include topics like civil engineering, electronics, electrical engineering, mechanical engineering, and robotics — topics many parents could not have imagined learning as early as elementary school.

STEM Maths

Similar to science, mathematics is one STEM category with classes that will sound familiar, such as algebra, geometry, and calculus. However, STEM math has two main differences from the math parents remember. First, kids are learning more advanced mathematics at younger ages with introductory algebra and geometry starting as early as third grade for some students, even those not enrolled in a STEM program. Second, it bears little resemblance to math as you may have learned it. STEM math incorporates concepts and exercises that apply science, technology, and engineering to mathematics.



STEM- Increasing Demand



We are now at a stage where the number of STEM jobs are growing at a fast pace and currently outstripping the number of STEM graduates. According to the National Science Foundation, it is predicted that 80% of the jobs created in the next decade will require some form of math and science skills. Despite having the top quality talent, the exam-focused education model of the past has limited these students when it comes to innovation, problem solving and creativity. This is where the STEM players come in to fill this gap.

Research shows that children develop interest in STEM fields at an average age of eight. This is because technology, gadgets and gizmos fascinate them. However, the leap from being a user of technology to an innovator rarely happens and, if at all, it is a very slow transition. The link between engineering-technology-entrepreneurship is evidently missing in India. In India, though nascent, there is a lot of innovation, which is taking place with regard to STEM:

The education sector is looking beyond smart classrooms towards hands-on learning and STEM enhancement on their current information and communications technology and smart class platforms.



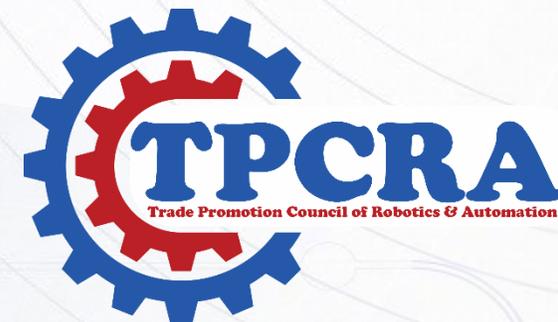
STEM - Challenges

One of the biggest challenges involved in the implementation of STEM education is to design infrastructure, curriculum and to equip children with the best guidance and support. Another challenge could be funding. Schools require money for construction of Maker spaces, DIY (Do it Yourself Tools), and best computers, which are some of the basic aspects of the STEM education.

Investing in educating the ecosystem about the need for such programmes is one of the ways of overcoming these limitations. Many of the educators still think that by introducing STEM, students will get diverted from their studies and they would not be able to complete their defined curriculum in that stipulated amount of time. The only way to address this is by making them aware and changing their beliefs by showing them the positive results of introducing their kids to STEM learning methodology.

Countries around the world are adopting this methodology by introducing national curricula that set frameworks and projects, which apply the STEM methodology. Several countries, upon realizing the potential of a STEM-incorporated programme, have risen to the occasion and persuaded their respective governments, districts and schools to make the transition. Japan, for example, has already taken the first steps towards this methodology by introducing national STEM frameworks for 2020 and others are quickly joining as well.

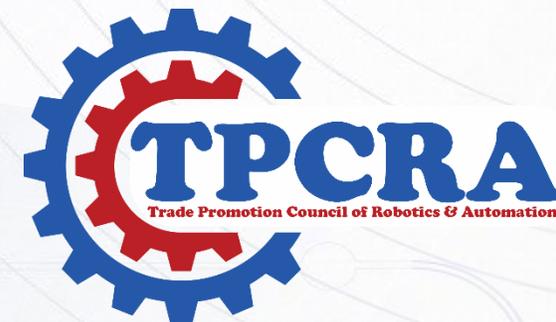
Being the second most populated country with unmatched talent and culture, India needs a combined support from government and other education societies to avail the opportunity and benefits of STEM education. Now, with the Government of India also focussing on campaigns such as 'Make in India' Innovation Mission, there is focus on developing innovation and manufacturing right from schools. This will be the right time for India to rise to the challenge and develop a culture of application-based learning and innovation among the schools, students, colleges, and teachers.



STEM - Benefits



- STEM has become a buzzword in education. Many people have a superficial understanding of STEM learning programs, but few grasp the impact it has on the larger picture of education. In some ways, STEM education is a long-overdue update to our overall education system intended to bring kids up-to-speed on the skills and knowledge most relevant in today's society.
- STEM initiatives also do more to reach and encourage females and minority students who may not have shown interest in STEM subjects in the past or may not have had strong support to pursue and excel in STEM subjects.



Why STEM

- We live in a time of great opportunity. The spirit of innovation can help us overcome challenges and ensure a prosperous and secure future. To seize this opportunity, we must position ourselves at the cutting edge of scientific discovery and technological innovation.
- Yet our country is falling behind in science, technology, engineering and mathematics. This is why many professionals and educators in science, technology, engineering, and mathematics believe that India should do more now than ever to encourage students to enter STEM-related fields. These experts say our young people need strong STEM skills to compete in the world market. We must work together to cultivate the next generation of critical thinkers and innovators.



STEM - Future



Fostering a strong STEM education is our best opportunity to boost the spirit of innovation. It is what we need to help ensure our country continues on a prosperous and secure journey. STEM literacy is also critical because it has a profound and growing impact on our day-to-day lives. Nature, space exploration, and any STEM-related interest reveals to us the beauty and power of the world we inhabit.



Launch with Award Program

Global STEM Awards & Summit

TPCRA Global STEM Awards aims at building a future of excellence in Robotics Education and developing an Eco-system for robotics technology to foster. TPCRA strive to do this, by felicitating achievements of Indian educational institutions, individuals and service providers, for improving the quality of education delivery in India through visionary thinking, process innovation and disruptive technology reforms.

The Global STEM Awards celebrates the exemplary work of the institutions and individuals working in Indian STEM sectors. Sharing of good practices through this platform will help in elevating the condition of Robotics and Automation in Indian Education Sphere.



Highlights of Global STEM Awards

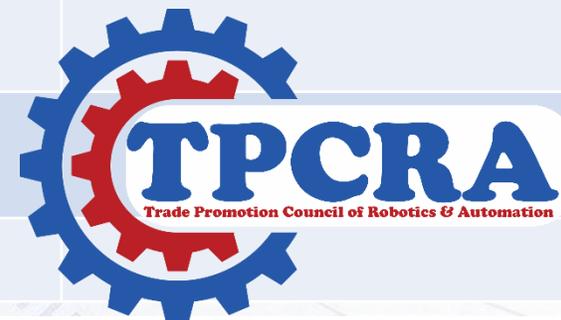


- Organized by Trade Promotion Council of Robotics and Automation (TPCRA), voice of Robotics and Automation Industry.
- Supported by various Ministries and Associations
- More than 2000 attendees.
- 64 Awards in 4 categories
- More than 2000 nominations
- Power packed Networking Meet
- States of India – Sharing roadmaps to Implement STEM
- Launch of STEM education Implementation Guide Book
- Presentation by CEO Discovery Education
- Presentation by CEO Henry Ford Education



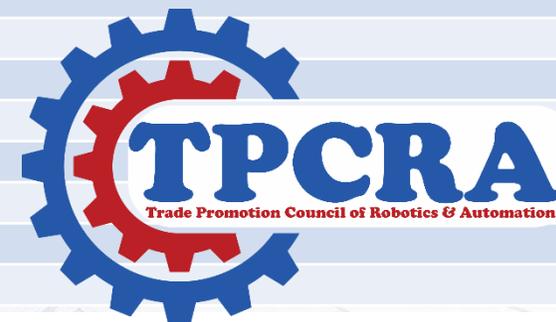
Global STEM Award Categories

Corporate (2 each = Total 22)	Higher Education (2 each = Total 20)	School Education (2 each = Total 14)	Individual (2 each = Total 6)
Best Online Education Provider Virtual and online training providers in STEM.	Global STEM Award 2020 (For University) University that has demonstrated exceptional performance in the past academic year.	Global STEM Award 2020 (For School) School that has demonstrated exceptional performance in the past academic year.	Lifetime Achievement Award Excellent contribution in building a platform for STEM education upliftment.
Excellence in Automation recognizing the best automation system integrators in the business.	Global STEM Award 2020 (For College) An institution that has demonstrated exceptional performance in the past academic year.	Outstanding Initiative of the year in Robotics. An initiative that has demonstrated an innovative, strategic approach to promote STEM education.	STEM Education Entrepreneur of the Year Innovation and business start-up.
Best Online STEM Seller Award eCommerce portal engaged in selling STEM educational products.	Best Technical Fest Award Engaging maximum students and visitors, technology showcase	Most Emerging School as Robotics Education Provider - Schools that has initiated robotics labs, Inclusion of robotics as curriculum. Training over robotics in school, workshop over robotics in school etc.	Woman Entrepreneur of the year in STEM - Contribution to STEM Education in any form.
Best Robotics Club Award Any independent or institutional club engaged in robotics activities.	Excellence and Innovation in Robotics Education New invention or Robotics project development.	Best Technology Infrastructure of the Year Outstanding Digital Infrastructure to deliver quality education.	Contribution to STEM Society Contribution to popularize and generate interest of STEM education in youth.
Vocational Robotics Education Awards Short term Robotics Training and workshop providers.	Outstanding Initiative of the year in Robotics An institutional initiative that has demonstrated an innovative, strategic approach to promote STEM education.	Best Robo-Lab Setup State of the art Equipment's, well defined projects, appropriate components and necessary certification.	
Vocational STEM Education Award Short term workshops and training providers in latest technologies.	Most Emerging Institute in Robotics Education Higher education institute, affiliated with either AICTE or any university, providing latest technology education.	Best Academic Innovative Curriculum (For School) Curriculum upgradation including STEM contents.	
Best Robo-Lab Setup State of art Robotics Lab with all arrangements and certification.	Most Emerging University in Robotics Education Centre, State or Private university providing advance technology education.	Largest no. of enrollment in robotics Schools that has made history of enrolling more than 1000 students for robotics education	
Best STEM Products Supplier Leading manufacturer or product developer in robotics components, projects and Kits.	Best Technology Infrastructure of the Year Outstanding Digital Infrastructure to deliver quality education.		
Best STEM Publication Best magazine, study material or any kind of publication to upgrade knowledge or spreading STEM awareness.	Best Robo-Lab Setup State of the art Equipment's, well defined projects, appropriate components and necessary certification.		
Best STEM Education Start up In the field of STEM education, supplies, services, products etc.	Best Academic Innovative Curriculum (For Higher Education) Initiative taken to develop innovative study content and curriculum.		
Best STEM & Robotics Solution Provider In the field of STEM & Robotics education, the best solution provider.			



Global STEM Awards Summit Agenda

09:00 - 09:30 am	Registration and Welcome Coffee
09:30 - 10:30 am	Inaugural Session
09:30 - 09:35 am	Lamp Lighting
09:35 - 09:40 am	Welcome Address by Director General, Trade Promotion Council of Robotics and Automation.
09:40 - 09:50 am	Opening remarks (Main Sponsor)
09:50 - 10:00 am	Address by Sponsor
10:00 - 10:10 am	Keynote Address by Chairman AICTE
10:10 - 10:20 am	Guest Address by Chairman UGC
10:20 - 10:30 am	Inaugural address by Secretary DST/Secretary MHRD/Minister HRD
10:30 - 10:35 am	Vote of Thanks by Director General TPCRA.
10:35 - 10:50 am	Address by (Sponsor)
10:50 - 11:45 am	Exhibition Inauguration by Secretary DST/Minister HRD followed by Expo Tour and Coffee
	Session – II : Expert Talk
11:45 - 12:10 pm	Expert Talk on Role of Technology in STEM education
12:10 - 13:00 pm	Session III – Panel Discussion
	Panel Discussion on STEM Education, Demand, Challenge, Impact and way forward.
13:00 - 14:00 pm	Networking Lunch and Visit to Exhibition
14:00 - 15:00 pm	Session IV : Expert discussion
	Expert will discuss/debate on How STEM education is transforming education system in India and need to Implement STEM by States of India.
15:00 - 15:15 pm	Presentation by (Sponsor)
15:15 - 15:30 pm	Presentation by (Sponsor)
15:30 - 16:00 pm	Coffee Break and Visit to Exhibition
16:00 - 17:30 pm	Govt. and Industry Networking Meet
17:30 - 18:00 pm	Change-over and Visit to Exhibition
18:00 - 20:00 pm	Global STEM Awards Ceremony
20:00 - 20:05 pm	Closing Remarks by Director General TPCRA
20:05 pm Onwards	Networking Dinner with Cocktails



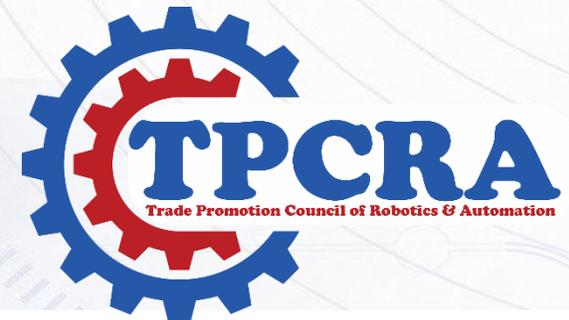
States for STEM Education Implementation

Pilot Phase

- Madhya Pradesh
- Haryana
- Chhattisgarh
- Uttarakhand
- Bihar

Optional

- Jharkhand
- Telangana
- Andhra Pradesh



Madhya Pradesh Education at a Glance

Status of Schools in Madhya Pradesh

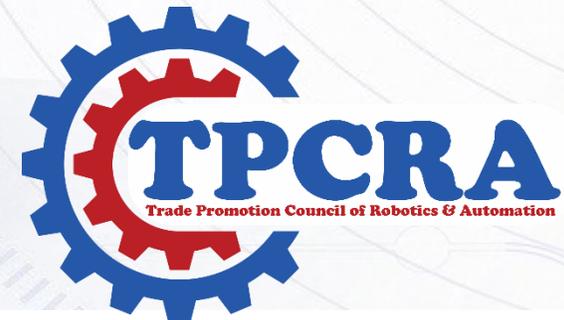
S.No.	Type of Schooling facilities	Total number in M.P.
01	Government Primary Schools	81,335
02	Financially Aided Primary Schools	961
03	Private Primary Schools	13,221
04	Government Secondary Schools	24,293
05	Financially Aided Secondary Schools	370
06	Private Secondary Schools	11,236
07	Ashram Schools (Opening level)	878
	TOTAL NUMBER OF SCHOOLS:	1,32,294

Eligible Schools for STEM Implementation

1,06,589

Expected Business

72,00,000 USD or 7.2 Million USD



Haryana Education at a Glance

Status of Schools in Haryana

City	High	Middle	Primary	Aarohi	Kisan	KGBVs	Lab School	Total	
Ambala	83	72	138	481	774				
Bhiwani	173	134	157	657	2	2	1	1126	
Faridabad	51	38	42	239	370				
Fatehabad	74	70	86	386	5	5		626	
Gurugram	69	49	91	363	572				
Hisar	131	137	98	504	6	4		880	
Jhajjar	132	44	53	297	1	527			
Jind	99	110	98	432	3	1	3	746	
Kaithal	93	53	73	372	3	2		596	
Karnal	89	79	122	488	1	779			
Kurukshetra		65	49	185	489	788			
Mahendergarh		94	50	132	472	1	1	751	
Nuh Mewat	40	40	262	481	5	5		833	
Palwal	52	51	143	360	4	1		611	
Panchkula	38	23	82	274	417				
Panipat	88	31	58	244	1	422			
Rewari	89	60	98	403	650				
Rohtak	117	45	36	211	1	410			
Sirsa	86	96	122	524	6	834			
Sonipat	126	83	81	427	717				
Yamuna Nagar		53	58	238	601	1		951	
Total	1842	1372	2395	8705	36	6	23	1	14380

Eligible Schools for STEM Implementation

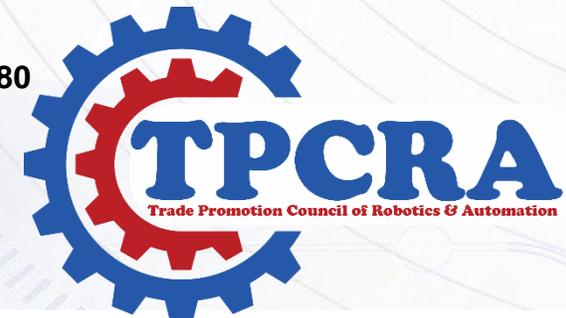
14380

Govt. Requirement

STEAM Curriculum
STEM LAB

Budget Allocated

8.6 Million USD



Chhatisgarh Education at a Glance

Status of Schools in Chhattisgarh

S.No.	Type of Schools	Total Schools in Chhattisgarh
01	Government Schools (Primary + Secondary)	47999
02	Financially Aided Primary Schools	327
03	Private Schools(Primary and Secondary)	7783
TOTAL NUMBER OF SCHOOLS:		56,109

**Eligible Schools for
STEM Implementation**

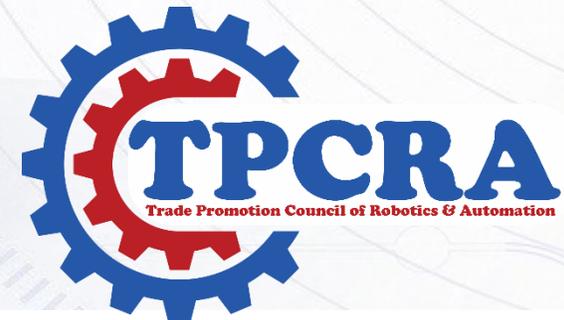
47,999

Govt. Requirement

STEAM Curriculum
STEM LAB

Budget Allocated

7.3 Million USD



Uttarakhand Education at a Glance

Status of Schools in Uttarakhand

S.No.	Type of Schools	Total Schools in Uttarakhand
01	Government Schools (Primary + Secondary)	12060
02	Financially Aided Primary Schools	171
03	Private Schools(Primary and Secondary)	3100
TOTAL NUMBER OF SCHOOLS:		15,331

Eligible Schools for STEM Implementation

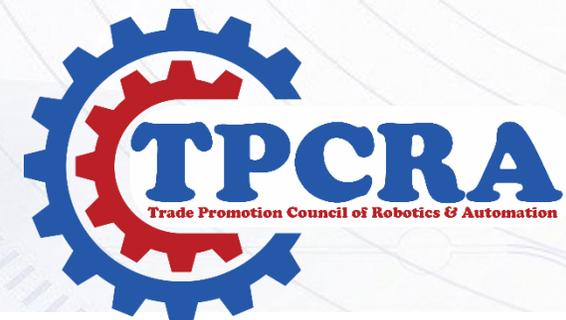
12060

Govt. Requirement

STEAM Curriculum
STEM LAB

Budget Allocated

5.7 Million USD



Bihar Education at a Glance

Status of Schools in Bihar

S.No.	Type of Schools	Total Schools in Bihar
01	Government Schools (Primary + Secondary)	47925
02	Financially Aided Primary Schools	907
03	Private Schools(Primary and Secondary)	23000
	TOTAL NUMBER OF SCHOOLS:	71832

Eligible Schools for STEM Implementation

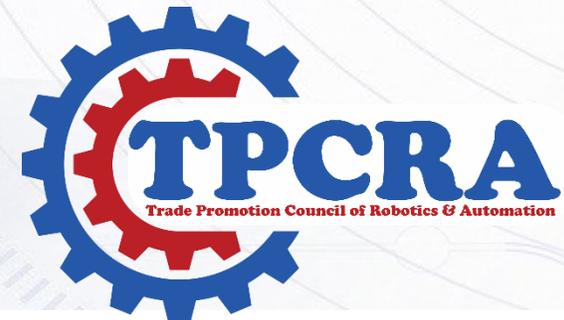
47925

Govt. Requirement

STEAM Curriculum
STEM LAB

Budget Allocated

9.7 Million USD



Plan of Action

Phase 1

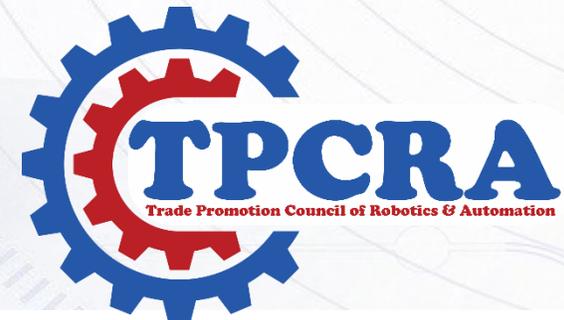
- Preparation of Proposals
- Evaluation of Proposal by Industry Experts
- Incorporation of Financials in the Proposal by Product Companies (Includes Discovery Education, Henry Ford Education, Edgefx)

Phase 3

- Submission of Commercial based on Mutual Discussion within Business Meet in July 2020
- Grant sanction for Implementation
- MoU Signing and Work Order Award
- Implementation of the STEM Education

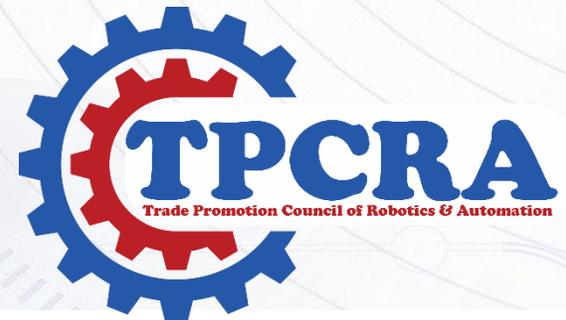
Phase 2

- Submission of Proposals to Government
- 1st Interaction Meeting with Minister or Principal Secretary Education.
- Presentation of Product by Implementation Partners (Includes Discovery Education, Henry Ford Education, Edgefx)



Business Revenue Expected in 5 Years

- Madhya Pradesh - 7.2 Million USD
- Haryana - 8.6 Million USD
- Chhattisgarh - 7.3 Million USD
- Uttarakhand - 5.7 Million USD
- Bihar - 8.7 Million USD



**Thank you for your
time and Consideration**

Sanjay Singh

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