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**THE REVOLUTIONS NEEDED IN
10 KEY SECTORS TO MAKE INDIA
A DEVELOPED NATION BY 2047**

THE STEM OF PROGRESS

HIGHER INVESTMENT IN STEM EDUCATION WILL BE CRUCIAL FOR EMPLOYMENT GENERATION AND GROWTH IN A TECH-DRIVEN UNIVERSE

In a world with constant churning in technological innovation, demand for manpower in Science, Technology, Engineering and Mathematics (STEM) has been rapidly growing. Advancements in Robotics, Artificial Intelligence (AI), Machine Learning (ML), cloud computing, and the Internet of Things (IoT) have accelerated demand for a talent reservoir around STEM. According to the Future of Jobs Report 2023 by the World Economic Forum, over 75 per cent of firms are looking to adopt AI, big data analytics and cloud computing in the next five years. Sectors like healthcare and financial services demand a convergence of STEM subjects. STEM fields will be critical in research that addresses the impact of climate change and future pandemics and to ensure food security.

WHY IT IS A GAME CHANGER

STEM education is crucial for developing nations to keep pace with tech advancements and remain globally competitive. By sharpening focus on this broad swathe of specialised but in-

terrelated knowledge domains, countries can strengthen their research capabilities, build new tech and offer local solutions to problems. This reduces reliance on import of technology and solutions, while enabling genuine knowledge exchange.

STEM education is crucial for employment generation too. Demand for STEM jobs in India rose by 44 per cent between 2016 and 2021 and is expected to grow by 50 per cent by 2025. The Future of Jobs Report, 2023, indicates that the top emerging jobs in India will be in AI and ML. With a population of 1.4 billion and a median age of 27, India must train its youth to exploit the full potential of this demographic dividend. That demands more budgetary allocation and higher focus on STEM education.

WHAT INDIA NEEDS TO MASTER

STEM education will play a pivotal role as India aspires to gradually move from being a services-led economy to a manufacturing-based one. With 34 per cent of its graduates being in STEM subjects, India is



HARDIK CHHABRA

THE CHANGE-MAKERS

10 MILLION

Projected number of Indian STEM graduates in 2025

43%

Of all STEM graduates in India are women, higher than the US (34 per cent) and the UK (38 per cent)



**TECH IS
THEIR TRADE**
The scene at a
research lab in
IIT Delhi



“Institutions must see a shift in pedagogy so as to foster an interest in STEM subjects. Learning at Deeksha STEM revolves around problem-solving, self-research, decision-making, innovation and communication”

— DR SRIDHAR G.
Founder, Deeksha STEM School

the global leader in terms of absolute numbers. However, there is an urgent need to expand the STEM universe. The Union government has encouraged STEM by introducing initiatives such as the Atal Tinkering Labs, Dhruv Scheme and Rashtriya Avishkar Abhiyan at the school level.

Programmes like Make in India, Digital India, Start-up India and Skill India are expected to deepen the pool. However, India needs to put in more money in STEM education. The Science and Technology Policy in 2003 mandated that 2 per cent of India's GDP would be spent on research and development by 2007. This goal has yet to be achieved.

The UNESCO Science Report of 2021 says India's average GERD (gross domestic expenditure on R&D) has been just 0.75 per cent of its GDP in the past two decades. It's the lowest GERD-GDP ratio among the BRICS nations: Brazil, Russia, India, China and South Africa. Though 43 per cent of all Indian STEM graduates are women, their share in STEM jobs is a minuscule 14 per cent—this reflects a global asymmetry that India must break. The National Education Policy 2023 has placed emphasis on STEM, but not only does it require speedy implementation, it must also be backed by adequate funding. Only then will India own the future. ■



THE ATAL TINKERING LABS (ATLS)

They are aimed
at becoming hubs of

innovation for school students. Over 10,000 ATLs have been established. ATLs are being nurtured by top organisations. Indian Space Research Organisation has adopted 100 ATLs. OPPO India will set up an ATL in Kerala—the first public-private collaboration for ATLs



DEEKSHA STEM SCHOOLS

Uniting conven-
tional education

with STEM and child well-being, Deeksha schools encourage self-learning and innovation



HOT WHEELS
Dr Sridhar G. with
students at the Diksha
STEM school, Bengaluru

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EDUCATION
TECH-DRIVEN EDUCATION

INTERCONNECTED BLACKBOARDS

FAST BROADBAND, AI AND LEARNING MANAGEMENT SYSTEMS WILL TRANSFORM EDUCATION. INDIA MUST BRIDGE A DIGITAL GAP, UPSKILL AND TRAIN TEACHERS AND BRING IN AN EDTECH POLICY TO REGULARISE CONTENT TO MAKE THE MOST OF THIS OPPORTUNITY

In the past two decades, the application of technology in education brought in a revolution, making learning more accessible and interactive. Technological interventions like learning management systems (LMS), Artificial Intelligence (AI), Machine Learning (ML), blockchain, metaverse, augmented reality (AR) and virtual reality (VR) are ushering in a new era of personalised learning experiences.

WHY IT IS A GAME CHANGER

Internet penetration, cellular data, smartphones and the emergence of edtech companies have begun the process of democratising access to education. The concept of 'blended learning'—combining classroom learning and online learning—has broken barriers and opened up ever-evolving structures of imparting and accessing knowledge. In India, where there is a shortage of teachers, technology can be a force