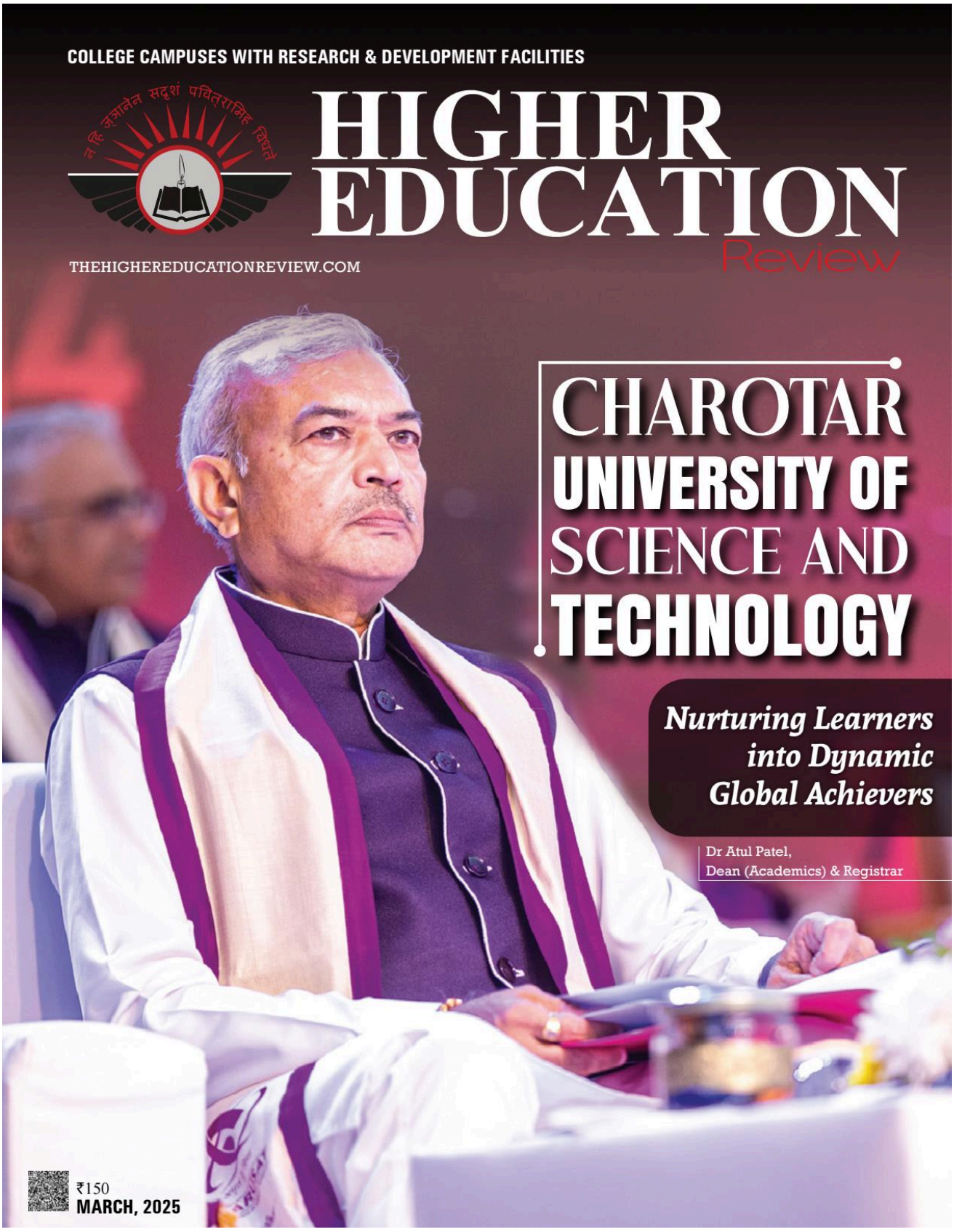
COLLEGE CAMPUSES WITH RESEARCH & DEVELOPMENT FACILITIES
HIGHER EDUCATION
Review
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CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
Nurturing Learners into Dynamic Global Achievers
Dr Atul Patel,
Dean (Academics) & Registrar
₹150
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Editorial

The Cornerstones of Innovation & Technological advancements

In today's rapidly evolving world, research and development (R&D) has become the cornerstone of innovation, and colleges with R&D facilities play a pivotal role in shaping the future. These institutions are not just centers for academic learning but are increasingly becoming hubs for cutting-edge research that addresses real-world challenges.

College campuses equipped with R&D facilities provide students with the opportunity to bridge the gap between theoretical knowledge and practical application. By working on research projects, students gain hands-on experience in problem-solving, critical thinking, and innovation, preparing them for careers in science, technology, engineering, and beyond. Furthermore, the presence of R&D labs fosters collaboration with industry professionals, government agencies, and other research institutions, creating an ecosystem where ideas can evolve into groundbreaking solutions.

Research conducted on college campuses can lead to technological advancements, environmental sustainability projects, and medical breakthroughs, all of which have far-reaching implications for society. These R&D centers also attract funding and partnerships, enhancing the institution's global reputation and providing students with access to world-class resources.

As colleges continue to invest in and expand their R&D capabilities, they not only contribute to academic excellence but also position themselves as leaders in shaping the future of industries worldwide. These campuses are, undoubtedly, the incubators for the next generation of innovators and change-makers.

After scrutinizing the top Colleges campuses that are equipped with modern R&D facilities, Higher Education Review has selected the top performers who have showcased exceptional academic expertise. With the intent to transform the lives of students, these colleges have exhibited the acumen to adapt to the evolution of the educational field and help students emerge victorious.

We look forward to receiving your feedback and suggestions.

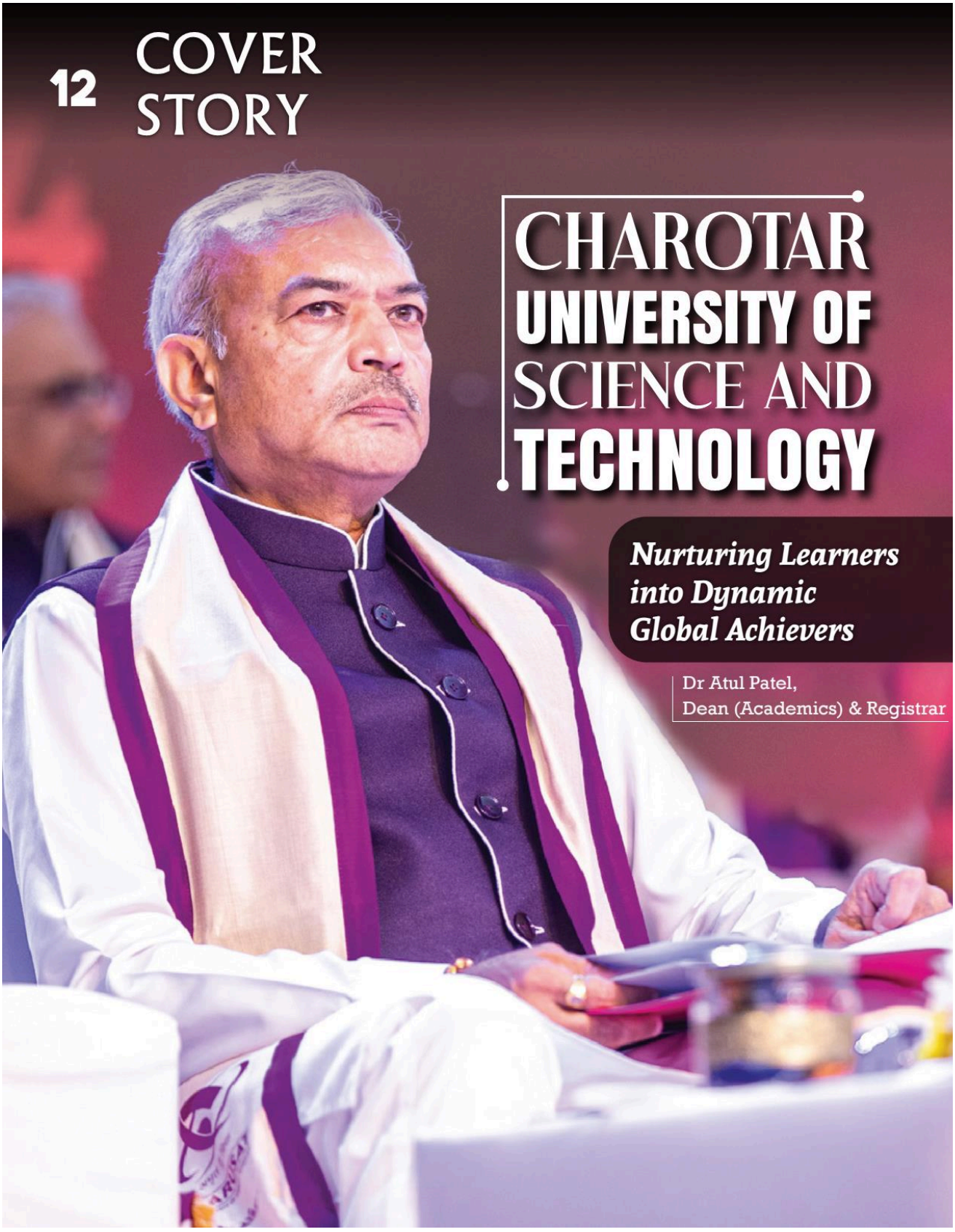
Mary Janifha Evangeline. X
Editor
editor@thehighereducationreview.com

12 COVER STORY

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

Nurturing Learners into Dynamic Global Achievers

Dr Atul Patel,
Dean (Academics) & Registrar



CONTENT

FOCAL POINT

THE FUTURE OF RESEARCH & INNOVATION IN INDIAN UNIVERSITIES

According to AISHE, the Indian higher education sector is expected to achieve a compound annual growth rate (CAGR) of 8.46% from 2024 to 2032. Low expenditure on R&D and 0.65% of the GDP of the country are the primary reasons behind the low research output in India. The future of Indian universities engaged in research and innovation is dependent on the integration of advanced technologies, cooperation between industry and academia, and the development of infrastructure facilities relevant to complex research innovations. This will lead to the changes that need to be incorporated into curriculums, which will focus on practical and research-oriented education, providing the necessity of integrating knowledge into its real-life application.

Indian universities are developing global knowledge that solves problems at both local and international levels. Indian universities work towards creating a complementary, collaborative, and sustainable research environment where academic efforts are grown toward fulfilling the needs of the real world. Indian universities have the potential to exploit their intellectual capital and comparative advantage to play a proactive role in building a knowledge society equipped to meet the challenges of today's world. With an appropriate strategy, Indian universities can build a future where academics become powerfully integrated with society's development and innovation.

Industry-Academia Collaborations

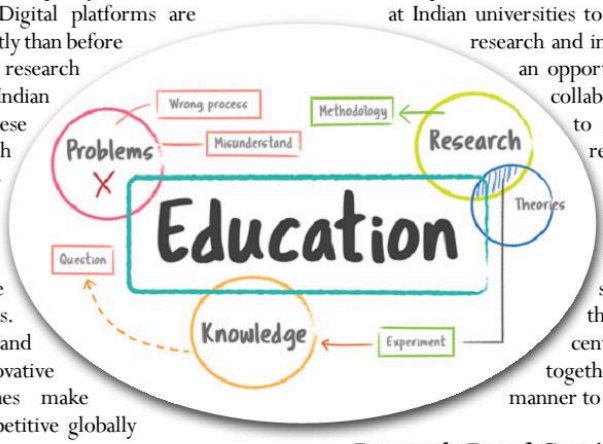
The future of research and innovation in Indian universities depends on building more industry-academia collaborations. Research has disconnected with industrialized problems that are relevant and practical. As both industries and areas of research become increasingly complex, universities are required to unite with businesses for research output to align better with the requirements of markets. Alternative formats and models include joint research, sponsored research programs, on-site internships, and incubation centers for startups. Such partnerships provide universities with funding and resources that enhance the quality of research while also providing valuable insights from industry to benefit students and faculty members in their pursuit of commercially relevant research. Knowledge exchange from industry to academia brings more applications that address problems such as climate change, digital transformation, and healthcare innovation. Strengthening such collaborations strengthens the relevance and impact of Indian universities in the academic and industrial domains.

Veezhinathan Kamakoti, Director, IIT Madras said, "Now, there is a need to accelerate innovation and research. For that, we need a lot of partnerships. These partnerships can be among higher education institutions and between industry and academia."

Technology Integration in Research

Integration of Artificial intelligence, machine learning, big-data analytics, and internet technologies have enhanced the methods employed by universities in more accurate ways to solve such highly complex issues. The adoption of such technologies by Indian universities ensures outcomes

that are more focused, and effective. For example, AI and machine learning can switch to medical research as they lead doctors to diagnose and provide a specific treatment plan faster. IoT ranges from environmental monitoring to urban development, providing researchers with real-time data. Such integration will increase the quality and relevant of research in Indian universities. Digital platforms are being used more frequently than before to collaborate among research communities. When Indian universities embrace these tools in their research processes, they are well-equipped to strengthen their collaborative networks and play a major role in solving the world's global challenges. Such investments and adoption of innovative technological approaches make Indian universities competitive globally in research and innovation.



Navakanta Bhat, Dean, Division of Interdisciplinary Sciences, IISc Bangalore said, "Over the last several years, IISc has established leadership in the areas of Semiconductor technology, Nanomaterials and Biological Sciences and will soon establish a Postgraduate Medical School to foster and amplify interdisciplinary collaborations between Engineering, Basic Sciences and Medicine. This MoU offers a unique opportunity to leverage the mutual strengths of the two universities to create a big impact on these critical technologies."

Strengthening Research Infrastructure

The infrastructure for research and innovation includes the modernization of laboratories, the facility for high-performance computing, the development of advanced data storage systems, and better access to global research networks. A well-equipped research infrastructure empowers students and faculty to carry out world-class research and use effective tools for innovation. Advanced research facilities can provide an environment for researchers to explore new ideas, experiment with advanced technologies, and collaborate with international peers. Research infrastructure that deals with high-performance computing facilities and cloud infrastructure plays a major role in data processing and analysis of very large data sets. Such large data patterns are highly seen in other research areas like genomics, climate science, and urban planning. Investing in research infrastructure makes universities more capable of carrying out their research and also attracts top researchers and scholars to share their thoughts around the world. Financial support from the government combined with investments from the private sector enhances the research infrastructures at Indian universities to undertake globally recognized research and innovation. Universities can take an opportunity from these international collaborations and grants to get access to sophisticated technologies and research resources.

VijayRaghavan, Former Principal Scientific Adviser, Government of India said, "Can we have a situation across science and technology where there are major international centres, where all countries come together in an open and collaborative manner to address the major challenges."

Research-Based Curriculum in Education

A research-based curriculum is crucial to establish a culture of innovation in Indian universities. The conventional curriculum provides significant emphasis on theoretical knowledge and does not equip the student for the pressures of conducting research and development work. A research-driven curriculum enhances problem-solving, critical thinking, and practical experience in research. Allowing research at every level of education in the country improves students' knowledge of all subjects and provides them with ways of discovering new knowledge. Programs with projects and laboratory work along with internships expose the student to practical experience within the same field, which helps students to understand current developments in the field. Additionally, curriculums that are based on research get the students into interdisciplinary projects with a global viewpoint and enable them to be innovative problem solvers and leaders. In this way, it brings the university in coordination with industry needs as students would acquire experiences and skills highly connected with industry.

Abhay Karandikar, Secretary, The Department of Science and Technology said, "PAIR has been initiated to boost the research capability of those universities where research is at a nascent stage but which have the potential to perform well, in a mentorship mode by pairing them with well-established top-tier institutions in a hub and spoke framework and providing substantial funding." HER

IN MY VIEW

LEARNING 2.0: WITNESSING THE EDUCATIONAL REVOLUTION

Dr. Karthikeyan Veerasamy, Principal, Thiagarajar Polytechnic College

Dr. Karthikeyan Veerasamy,
Principal

Dr. V. Karthikeyan, with 39 years of teaching experience, has garnered extensive expertise in the field. He earned his Bachelor's Degree in Civil Engineering, followed by a Master's degree and a Ph.D. in Environmental Engineering. In a recent interaction with Keerthana, Correspondent, Higher Education Review, Dr. Karthikeyan Veerasamy, principal, Thiagarajar Polytechnic College, assisted us in examining the core values of a modern educational philosophy that values creativity, diversity, and the unrelenting pursuit of knowledge in the piece that follows.

There has been a radical change in the educational environment that is leading to an evolved learning culture. This paradigm transforms the conventional approach to teaching and learning by embracing cutting-edge technologies and new approaches. It includes flexible teaching methods that support a range of learning preferences while encouraging cooperation, critical thinking, and creativity.

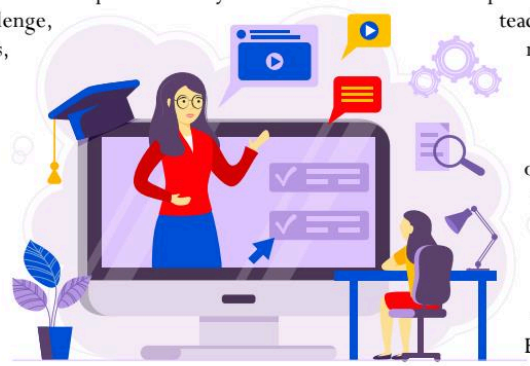
In your opinion, what are the ethical considerations when implementing innovative educational practices?

Over the past decade, there has been a paradigm shift in education, moving from traditional teacher-centered learning to a more technology-integrated, student-centered approach. In the earlier model, teachers were predominantly focused on imparting knowledge through one-way communication, resulting in varying levels of understanding among students. This teacher-centered learning approach hindered innovation, critical thinking, and lateral thinking. Well, in recent years, the emphasis has shifted towards leveraging technology to enhance both teaching and learning, highlighting an ear where ethical consideration goes hand-in-hand with educational practices. This shift has completely normalized the adoption of many best innovative educational practices like student-centeredlearning, student facilitators, speaker forums, remedial classes, tech talk, and learning management systems. And moving forward, this shift aims to achieve more uniform knowledge transfer among students, minimizing variations in examination scores while ensuring uniform academic outcomes in an ethical way.

In your opinion, what is the most significant challenge in education today, and how would you address it with innovative practices?

The educational landscape has changed significantly in the last decade or so, particularly at technical education institutions, colleges of arts and sciences, and medical schools. The extensive use of electronic devices in the classroom by students has drastically changed the educational landscape. Gone is the custom of using libraries to obtain reference materials. It is inevitable that technology will advance, and as educators, we must

welcome and value this development.With smartphones, iPads, and tablets in hand, today's students have unparalleled access to a wide range of instructional resources from the comfort of their seats. Students no longer need to physically visit libraries as earlier days because they may instantaneously download or view pertinent content. And, as a teacher, I completely recognize the power of electronic gadgets in enhancing students' knowledge and fostering innovation.I encourage students to use their devices as tools for improving understanding and promoting critical thinking. For instance, I leverage technology to explain complex concepts like the bending and deflection of beams with different load conditions through multimedia presentations. This student facilitation approach empowers them to remember, understand, apply, analyze, evaluate, and even create new concepts effectively. And, here comes in the biggest challenge, distraction. Despite various benefits, these electronic gadgets cause potential distractions that harms the education life cycle. However, it is important that we view these challenges as opportunities to embed technology in a way that directs students' focus toward meaningful engagement. By addressing these challenges, we not only mitigate distractions, but also empower students to navigate and utilize technology responsibly.



In your opinion, what are the key principles of innovative education, and how do they differ from traditional teaching methods?

In traditional teacher-centered learning, communication is unidirectional, focusing primarily on teaching rather than ensuring effective learning. This approach may leave students uncertain about their understanding. In contrast, student-centered learning fosters a dynamic two-way communication channel between teachers and students. Here, teachers not only disseminate information but also facilitate understanding through processes like remembering, understanding, applying, analyzing, evaluating, and creating—a concept akin to Bloom's Taxonomy. This method significantly differs from teacher-centered learning, where assessing students' understanding is more challenging, leading to a notable variance in exam scores.The most effective innovative practice involves engaging students, integrating technology, fostering critical thinking, and promoting collaborative problem-solving. This student-centered approach enhances students' communication skills and overall understanding. Notably, feedback from students in such environments is more satisfactory for teachers. This feedback becomes a catalyst for lifelong learning, as students continue to learn and adapt even after completing their formal education—a testament to the success of continuous learning initiatives.

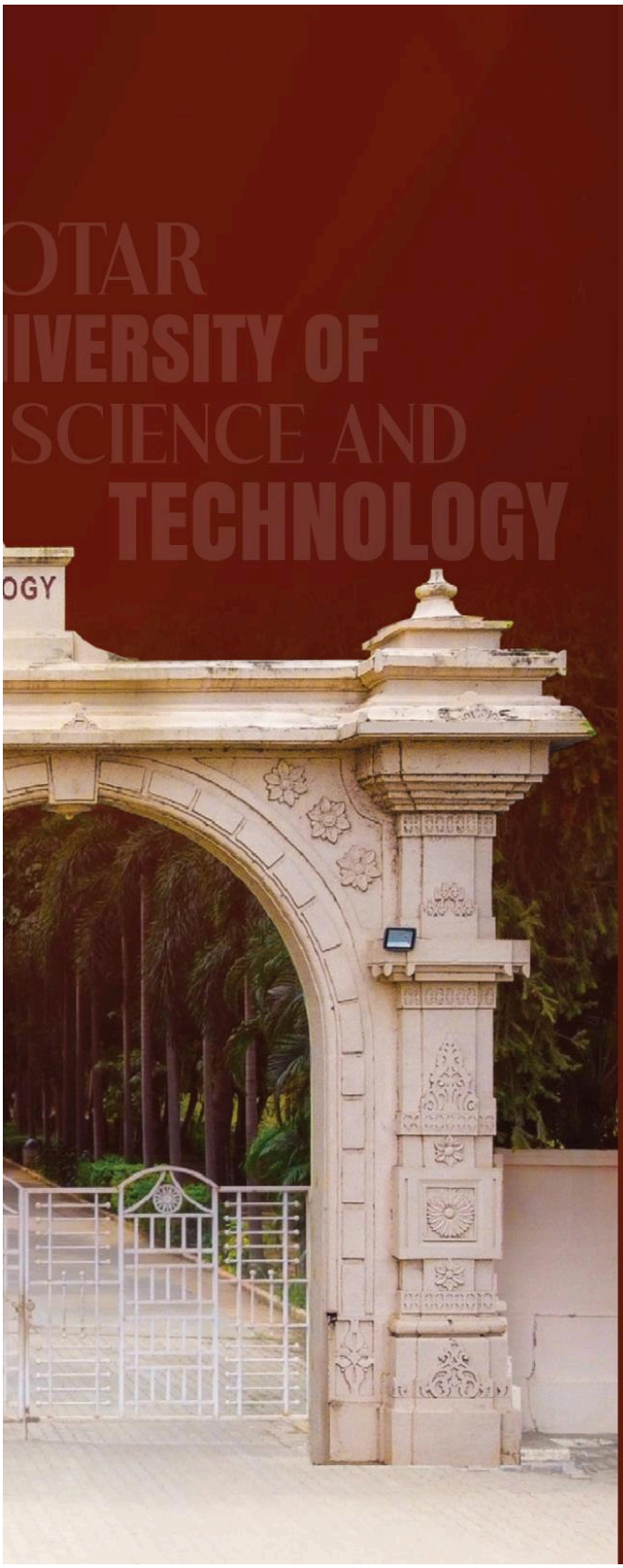
How can we stay up-to-date with the latest trends and developments in education, and how should we incorporate them into teaching or educational programs?

In the pursuit of excellence in teaching, I have always emphasized the importance of continuous learning and professional development for educators. I believe that teachers must dedicate at least 30 minutes daily to staying updated through technical journals or magazines relevant to their domain. This commitment to ongoing learning ensures that instructors bring fresh insights and updated knowledge to the classroom, enhancing their ability to connect theoretical concepts with real-world applications. Beyond traditional sources, educators can leverage media, government communications, and social media platforms to share their research, achievements, and stay informed about global developments. Engaging with platforms like Twitter (X) and LinkedIn facilitates networking with peers and professionals, broadening perspectives.Furthermore, collaboration with colleagues within and outside the education sector is vital for professional growth. Teachers should actively seek opportunities to collaborate with professionals from other industries and universities, fostering interdisciplinary learning. Additionally, I emphasize the importance of developing a diverse skill set, aligning their skills with industry expectations, and cultivating a positive attitude.

While concluding this conversation, I stress that the world offers abundant opportunities, and with a combination of skills, effective communication, critical and creative thinking, students can confidently navigate their career paths. India, in particular, is a landscape of opportunities, and students are encouraged to seize these prospects, adapt to challenges, and emerge successful in their chosen endeavours. HER

COVER STORY

CHARUSAT fosters a research environment based on professionalism, integrity, and ethical conduct, supporting academic freedom for scholars and teachers to pursue research in their fields of interest



HIGHER EDUCATION Review TOP 10 PROMISING
COLLEGE CAMPUSES WITH
RESEARCH & DEVELOPMENT FACILITIES - 2025

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

Nurturing Learners into Dynamic Global Achievers

By Deepshikha

In India, numerous college campuses are making remarkable strides in research and development, fostering a culture of innovation and contributing significantly to technological and scientific advancements. Such institutions not only play a pivotal role in shaping the future of education but also collaborate with industries and research organizations to drive progress. Among leading institutions, Charotar University of Science and Technology stands out as a prominent hub of academic excellence and research.

The foundation of the university traces back to 1895, when the Patidars of Charotar region in Gujarat created the Shri Charotar Moti Sattavis Leuva Patidar Samaj, Matrusanstha, aiming to nurture social values. In 1993-94, the idea of establishing an educational organization in the Charotar region materialized with the formation of the Shri Charotar Moti Sattavis Patidar Kelavani

Mandal. This initiative was led by Late Shri Chhotabhai Bhikhabhai Patel, a prominent businessman and social leader, and Late Dr K. C. Patel, a renowned nuclear scientist and educationist.

In 2000, an educational campus was established at Changa, and the journey of transforming this campus into a university began. The campus grew rapidly, with several institutes established over the years, leading to the formation of CHARUSAT in July 2009. The university was named Charotar University of Science and Technology to honor the region of Charotar, often referred to as the 'golden' land.

The early leadership of the university included Shri Surendra Patel as president and Dr M.C. Patel as secretary. Surendra Patel, affectionately called Kaka, continues to serve as the current president. Dr M.C. Patel continues his volunteer service as the secretary of the Kelavani Mandal.

CHARUSAT began with the Charotar Institute of Technology - Changa (CITC), which later became the Chandubhai S. Patel Institute of Technology (CSPIT). It started with an investment of ₹3 crore, offering 4 programs to 240 students. Over the years, the institute expanded significantly and now consists of 9 institutes, offering 72+ programs to over 10,000 students, with a capital investment exceeding ₹150 crore.

A Vision of Excellence in Education & Innovation

CHARUSAT offers semester-based programs under the Choice Based Credit System, with curricula designed to meet international standards in science and technology while addressing national demands. The focus is on industry-driven research and entrepreneurship development. The evaluation system combines internal (continuous) evaluation and end-semester exams, ensuring a balanced approach with input from external and internal examiners. A student-friendly learning environment is maintained through a structured commencement program, adherence to the academic calendar, and a mentor-mentee system.

The university has achieved remarkable success in research, with over 80 funded projects worth ₹14 Crores, more than 2800 publications in national and international journals, and 25+ patents filed. Its strong industry interface is managed through the University Industry Interaction Cell (UIIC), fostering consultancy projects in commercial, technological, scientific, environmental, and social fields.

CHARUSAT fosters a research environment based on professionalism, integrity, and ethical conduct, supporting academic freedom for scholars and teachers to pursue research in their fields of interest. All researchers, including faculty, students, and collaborators, must adhere to the

policies. The university offers research opportunities for Bachelor's and Master's students, including mini-projects, dissertations, and summer training. Additionally, it provides the Postgraduate Student Fellowship (PGSF) to enhance research output and attract prospective PhD scholars. This initiative aims to produce high-quality research papers and projects, establishing the institute as an internationally recognized research center.

"The teaching-learning process is enriched through adopting pedagogical innovations to achieve outcome based education, feedbacks from stakeholders, regular upgrade of faculty domain knowledge and diverse initiatives like projects, internships, industrial visit, and expert sessions", shares Dr Atul Patel, Dean (Academics) & Registrar, CHARUSAT.

Encouraging Research based Learning

CHARUSAT recognizes research and innovation as key drivers of growth and development, with its PhD programs being a crucial component of its research framework. These programs are offered across various faculties, including Applied Sciences, Engineering & Technology, Computer Science, Pharmaceutical Sciences, Management, Humanities, Physiotherapy, Nursing, and Paramedical Sciences. PhD scholars are encouraged to engage in frontier research problems using uni-disciplinary, interdisciplinary, and multidisciplinary approaches. The university aims to attract talented candidates to pursue full-time PhD programs.

The CHARUSAT Visitor Student Research Internship (CVSRI) is designed to attract bright students globally to participate in research activities for a short term. Mentored by professors or associate professors, interns can engage in departmental or institute-level research or explore their own interests. The university has a separate policy for CVSRI, and researchers are also encouraged to participate in training programs, workshops, and conferences, with financial assistance provided based on CHARUSAT's norms.

Facilities and Collaborations

CHARUSAT University provides a range of state-of-the-art facilities for students and faculty. The campus spans 125 acres of lush green lawns and trees, offering a Wi-Fi-enabled environment. It boasts advanced laboratories with safety features, ICT-enabled classrooms, interactive theatres, seminar halls, computer centers, auditoria, and a well-equipped library with a wide range of textbooks, reference materials, national and international journals. The high-end research facility, sports and fitness center, and four hostels that can accommodate over 1,000 female students further enhance the university's infrastructure.

The university also houses NABL-accredited labs, including the Concrete Technology Lab, Geotechnical Engineering Lab, and Environment Auditor Lab, ensuring compliance with industry standards. CHARUSAT collaborates with numerous prestigious organizations such as AICTE, DRDO, ISRO, TATA Strive, and the Ministry of Science & Technology, among others. These partnerships contribute to its strong research and development framework.

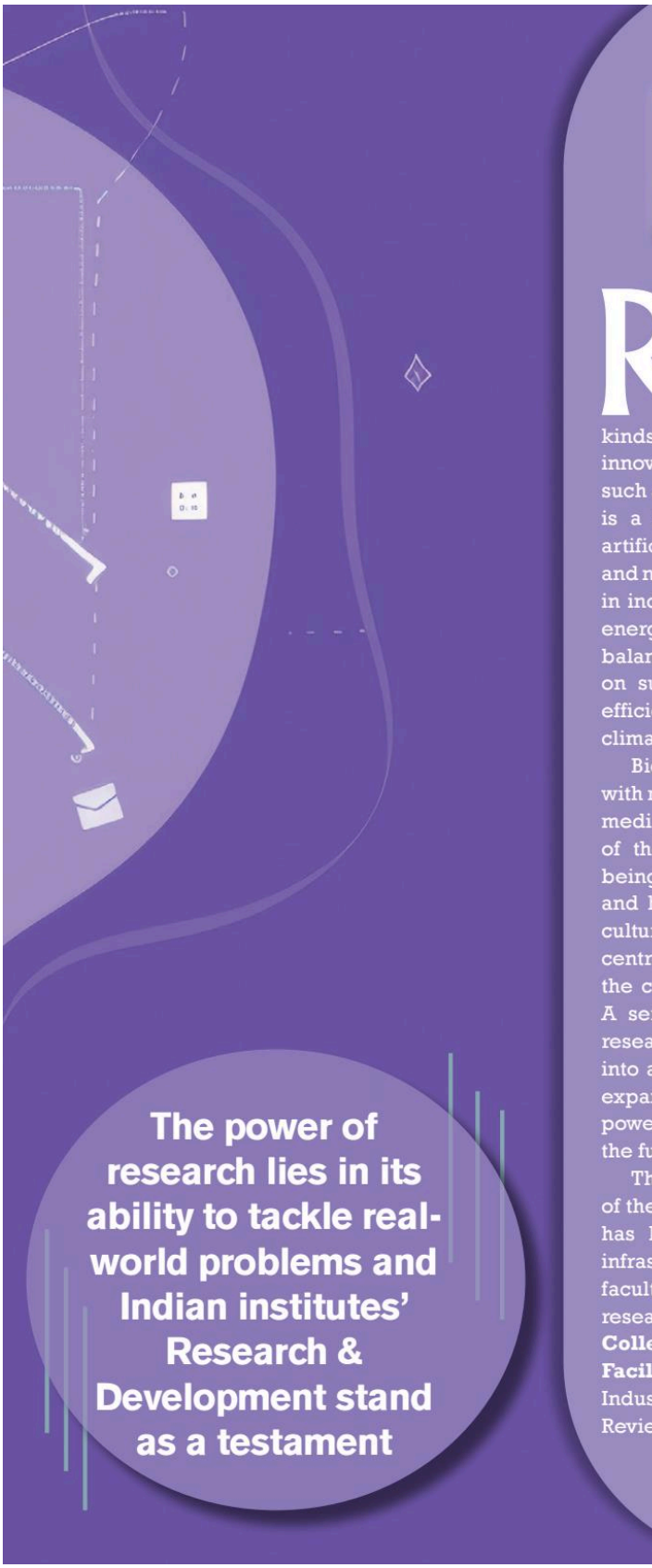
Recognized by the Department of Scientific and Industrial Research (DSIR) and awarded the prestigious Promotion of University Research in Scientific Excellence (PURSE) grant of ₹8.51 crores by DST, the institute has earned accolades, including the best ICT Initiative in Education by the Gesia-Gujarat Electronics and Software Industries Association.

The university's entrepreneurial ecosystem includes CIVF (a Section 8 company) and CSIC (Charusat Startup and Innovation Centre). These centers offer mentoring, investment opportunities, business development services, and incubation support for start-ups. They provide infrastructure, technology linkages, product branding, intellectual property management, and regulatory compliance advisory, fostering an environment conducive to innovation and enterprise growth.

Leap towards Success

The institute has pioneered a paperless digital examination system, where exams are conducted online with a stylus, and all information is saved in the cloud. The year 2025 marks CHARUSAT's silver jubilee, celebrating 25 years of excellence in education. The university kicked off the year with its convocation on January 4 and continues the celebrations with sports and cultural events, including a live concert by Sachin-Jigar on January 24 and the Republic Day celebrations, showcasing its commitment to fostering a vibrant academic and cultural community.

For future, CHARUSAT is committed to providing a dynamic research environment that encourages innovation, academic freedom, and ethical conduct. With a strong focus on quality research, collaboration, and fostering talent, the university aims to contribute significantly to academic and scientific advancements. Through various initiatives and fellowships, it continues to cultivate future researchers and leaders in multiple disciplines. **HER**



HIGHER EDUCATION Review TOP 10 PROMISING

COLLEGE CAMPUSES WITH RESEARCH & DEVELOPMENT FACILITIES - 2025

The power of research lies in its ability to tackle real-world problems and Indian institutes' Research & Development stand as a testament

Research and Development (R&D) centres in Indian institutions have surfaced as key players in the proceedings of science discovery and technology innovation. Furthermore, these centres have recently emerged as new frontiers in varied kinds of production, often close to their fields of study. Green innovation towards tackling certain critical global challenges such as climate change, health care and digital transformation is a similar pattern emerging in advancing advances in artificial intelligence, machine learning, quantum computing and nanotechnology. These show the way to new opportunities in industrial sectors such as robotics, aerospace, renewable energy and biotechnology. These R&D centres continue to balance scientific requirements with a growing emphasis on sustainability through clean energy solutions, energy-efficient systems and eco-friendly materials addressed to the climate crisis.

Biomedical research is now becoming a premier sector with much hype around topics like gene editing, personalized medicine, and vaccination technologies, given the scenario of the recent pandemic. In principle many R&D centres being computed within the parameters of social sciences and humanities, a research pursuit that focuses on society, culture, and economics. Another emerging trend within these centres is the serious mixing of research with industry for the commercialization of different technologies developed. A serious step towards the joining together of academic researchers with industry experts should thus translate into a real-world usage: entrepreneurship and the economy expand upon each other. These R&D centers are not only the powerhouses of advancing knowledge but are also remaking the future of all industries with effective innovations.

This issue of **Higher Education Review** talks about some of the professionally managed colleges in the country, which has been nurtured with best technical and professional infrastructure and assistance from efficient and skilled faculties ensuring delivery of quality higher education and research. This issue spotlights a list of **'Top 10 Promising College Campuses with Research & Development Facilities - 2025'**, the list has been crafted by a team of Industry veterans, CEOs, VCs and the Higher Education Review editorial team.

HIGHER EDUCATION Review TOP 10 PROMISING

COLLEGE CAMPUSES WITH RESEARCH & DEVELOPMENT FACILITIES - 2025

Anna University
Chennai
annauniv.edu

Dr. Govi Chezhiaan
Pro-Chancellor

The university focuses on multidisciplinary research in areas such as engineering, technology, science, and management and supports collaboration with national and international research organizations, industries, and government agencies

Dr B. Lal Institute Of Biotechnology
Jaipur
blalbiotech.com

Saksham Gupta
Director

The institute provides access to sequencing facilities, bioprocess engineering labs, and computational biology centers, equipping students with the expertise to navigate the intersection of biotechnology and data science

Banaras Hindu University
Varanasi
bhu.ac.in

Prof. Sanjay Kumar
Rector

The university fosters interdisciplinary research across various fields, including science, engineering, technology, medical sciences, humanities, and social sciences

Indian Institute of Science
Bangalore
iisc.ac.in

Govindan Rangarajan
Director

The institute is known for its advanced research in fields such as engineering, natural sciences, and technology, focuses on interdisciplinary projects aimed at addressing critical national and global challenges

Charusat University
Changa
charusat.ac.in

Dr Atul Patel
Dean (Academics) & Registrar

The university offers research opportunities for Bachelor's and Master's students, including mini-projects, dissertations, and summer training

Indian Institutes of Technology
Kharagpur
iitkgp.ac.in

Prof. Amit Patra
Director

The institute's research & development centre supports a broad spectrum of research areas, including aerospace engineering, artificial intelligence, robotics, renewable energy, and infrastructure development

Sasi Institute Of Technology & Engineering
West Godavari
sasi.ac.in

Meka Kranthi Sudha
Secretary & Correspondent

The institution promotes R&D by inspiring students to participate in hackathons and workshops nationally and globally, it has its own Centre of Excellence and Startup incubator

University of Hyderabad
Hyderabad
uohyd.ac.in

Prof. Basuthkar Jagadeeshwar Rao
Vice-Chancellor

The university focuses on innovation, with research areas ranging from biotechnology, nanotechnology, environmental science, and data analytics to social sciences and humanities

Tula's Institute
Dehradun
tulas.edu.in

Silky Jain Marwah
Executive Director

The institute redefines research and development, transforming ideas and students into innovators, shaping the future of technology, entrepreneurship, and industrial progress

Vellore Institute of Technology
Vellore
vit.ac.in

Dr. G Viswanathan
Chancellor

The institute's research & development centre is known for its research in emerging fields like artificial intelligence, data science, robotics, nanotechnology, and environmental sustainability

DR B. LAL INSTITUTE OF BIOTECHNOLOGY

ADVANCING SCIENTIFIC DISCOVERIES THROUGH STRONG INDUSTRY-ACADEMIA PARTNERSHIPS

The biotechnology sector is transforming industries, driving innovation in healthcare, agriculture, environmental sustainability, and industrial applications. With government initiatives like the BioE3 Policy and Genome India Bio Policy, India's biotech market is projected to surpass $200 billion, creating vast opportunities. To meet industry demands, academic institutions must align with emerging advancements. Dr B. Lal Institute of Biotechnology stands at the forefront, offering a specialized curriculum in genomics, synthetic biology, bioinformatics, and AI-driven applications, preparing students to become future scientists, researchers, and entrepreneurs.

Dr B. Lal Institute of Biotechnology (BIBT) thrives on a structured research-driven ecosystem, seamlessly integrating innovation into academia. The Research, Development & Innovation (RD&I) Department, guided by seasoned faculty and industry experts, provides an environment where students engage in high-impact biotech research. Prototyping, patent filing, and scientific publishing are core aspects of the student experience, with several funded projects transforming theoretical knowledge into tangible solutions.

The institute's research framework encourages students to pursue interdisciplinary studies, fostering expertise in genomics, synthetic biology, bioinformatics, and AI-driven biotech applications. Through industry collaborations, students work on real-world projects, ensuring they graduate with not just academic knowledge but practical experience in solving contemporary biotech challenges.

Cutting-Edge Infrastructure

At BIBT, the state-of-the-art laboratories house advanced biotech instrumentation, facilitating hands-on training in genetics, molecular biology, microbiology, and bioinformatics. Specialized research facilities encourage real-world experimentation, ensuring students spend significant time in labs rather than just classrooms. The institute's industry-standard protocols and access to modern equipment prepare graduates for research, healthcare, and industrial biotech applications.

Saksham Gupta,
Director

Their ecosystem nurtures a mindset of exploration, prototype development, and scientific advancement, embedding biotech entrepreneurship within academic frameworks. Additionally, the institute provides access to high-throughput sequencing facilities, bioprocess engineering labs, and computational biology centers, equipping students with the expertise to navigate the intersection of biotechnology and data science.

The developing biotech sector requires professionals with industry-relevant skills that align with technological advancements. BIBT meets this demand through specialized certifications, hands-on training, and career development initiatives. Personalized counseling refines career paths, resume workshops enhance professional portfolios, and mock interviews build confidence for recruitment. The curriculum covers regulatory affairs, biotech entrepreneurship, and bioethics, ensuring graduates possess both technical expertise and industry awareness. Industrial visits, internships, and expert lectures bridge academia and industry, equipping students with the experience needed to excel in the workforce.

Sustainability as a Core Philosophy

BIBT's 'Zero Waste Campus' fosters sustainability through eco-conscious practices like wastewater filtration, composting, and waste segregation. An organic garden promotes sustainable agriculture, while canteen waste is converted into organic fertilizer. The curriculum emphasizes green biotech solutions, encouraging students to develop biodegradable materials, enhance biofuel efficiency, and create eco-friendly microbial treatments for waste management and climate resilience.

The research-driven partnerships at BIBT extend beyond academia, collaborating with leading biotech incubators and enterprises. Its integration with Dr B. Lal Clinical Laboratory, Rajasthan's top diagnostic network, enables clinical research in biotech advancements. Industry ties with Atal Incubation Centers, iStart, and Biocogniz grant access to world-class incubation facilities and startup resources. Collaborations with NGOs and social enterprises translate biotech solutions into real-world impact, tackling healthcare accessibility, bio-waste management, and environmental conservation. Research symposiums and biotech hackathons further fuel scientific inquiry and innovation.

Alumni Driving Institutional Growth

A global alumni network spanning over 2,000 professionals strengthens BIBT's industry connections and academic reputation. Graduates occupy leadership roles and pursue higher education across the U.S., Canada, UK, Australia, and Europe, contributing to the institute's international standing. The 'Vartalaap' Series ensures knowledge exchange, with alumni mentoring students on career trajectories, industry trends, and professional development. Exclusive job-sharing channels provide direct hiring opportunities, bridging the gap between academia and industry. Alumni-driven initiatives, such as biotech startup incubation and global networking events, further enhance opportunities for current students. The alumni network remains actively involved in curriculum enhancement, ensuring that academic programs evolve in sync with industry advancements.

An exclusive biotechnology institute, BIBT operates beyond conventional academic boundaries. With 25+ funded research projects, a rigorous industry-integrated curriculum, and a 100 percent placement record, the institute sets benchmarks in biotech education. Backed by Dr B. Lal Clinical Laboratory's three-decade legacy in diagnostics, students gain unparalleled exposure to real-world applications. Consistent university-level gold medal achievements reflect academic excellence, while collaborations with biotech industries, research organizations, and funding agencies reinforce the institute's commitment to research-driven education. A strong faculty pool, consisting of Ph.D. scholars, industry professionals, and international researchers, ensures that students receive mentorship from experts at the forefront of biotech innovation. The institute's commitment to fostering biotech entrepreneurship has led to the development of multiple startup ventures, many of which have received national and international recognition.

> Dr B. Lal Institute of Biotechnology fosters innovation, equipping future leaders with cutting-edge research, hands-on training, and strong industry connections

Future Roadmap of Global Center for Biotech Innovation

BIBT's trajectory leads towards establishing a globally recognized biotechnology hub. The Bio-Innovation Incubation Center (BIIC) accelerates biotech entrepreneurship, already fostering two registered startups and over 15 innovations in development. Four prototypes have emerged, with three projects securing funding from national and international agencies. The roadmap prioritizes deepening research expertise, expanding entrepreneurial initiatives, and scaling sustainable biotech solutions. In the long term, they aspire to attain recognition akin to premier institutions such as the IIMs, cementing their position as an elite global biotech education and research powerhouse.

In addition, expansion plans include developing a dedicated Center for Artificial Intelligence in Biotechnology, launching international exchange programs, and establishing collaborations with global biotech giants to drive pioneering research. The vision extends beyond academia, aiming to influence policy frameworks, shape the next generation of biotech leaders, and redefine India's contribution to the global biotechnology landscape.

In conclusion, Dr B. Lal Institute of Biotechnology is a beacon of excellence in biotech education, seamlessly integrating academic rigor, practical exposure, research innovation, industry collaboration, and sustainability. As it continues to evolve, the institute is well-positioned to lead the next generation of biotechnology professionals toward shaping a more sustainable, technology-driven future. HER

SASI INSTITUTE OF TECHNOLOGY & ENGINEERING

STAYING AHEAD IN R&D PROGRAMS WITH A FOCUS ON SERVING THE UNDERSERVED REGIONS

Several government initiatives have been taken to uphold the fundamental right to education in the underserved and remote regions of India. We have also witnessed the emergence of various privately funded institutions that have dedicated advanced resources to establish schools and higher education institutions in these regions and impact people's standard of living. Technology and Engineering education has been at the forefront of modernized education in the country and to impart this education among the underserved and remote regions of the country can be considered a great feat regarding the country's development.

In a state like Andhra Pradesh where the overall literacy rate stands at 67.02 percent with a female literacy rate of 59.5 percent, there is still an exponential amount of geography that needs to be covered by the administrative bodies and private institutions to get this percentage higher in the coming years. SASI Institute of Technology & Engineering was established specifically to serve the district of East & West Godavari, Andhra Pradesh which has 811 villages under it, according to the latest census report. It has been providing advanced engineering and technology education to students coming from all across the district and making an impact on their standards of living by providing placements up to 20 Lakh CTC from reputed MNCs.

It is an AICTE-approved institution which was established in 2002. The parent organization to the engineering institution, SASI Educational Society is spread over East & West Godavari districts to empower the rural areas of AP and it has student strength of over 40000 across several schools and colleges under its authority. Over the years, the primary goal of the institution has been to impart education specifically to the underserved for which it has got immense support from the government and other private collaborations. It has established several schools across the villages of East & West Godavari and made efforts to increase the literacy rate in these regions. "Our institution is spread over 45 acres of land and has all modern lab facilities. Currently, we have 250+ faculty in our institution among which 120+ have PhDs", mentioned B. Venu Gopala Krishna, Chairman, SASI Institute of Technology & Engineering.

Meka Kranthi Sudha,
Secretary & Correspondent, SASI Institute Of Technology & Engineering

Education Excellence

There is a complete range of aspects that stand as an advantage to the institution. It is a JNTU Kakinada, permanent affiliated institution with NBA and NAAC "A" grade accredited college. It is also an ISO Certified Institution and offers engineering and technology education about multiple streams that include CSE,

IT, ECE, Computer Design, AI & ML, IoT, and others. Research Centres has been allotted to CSE, ECE, EEE, Mech and Physics departments by JNTU - K.

The institution promotes R&D by inspiring students to participate in hackathons and workshops nationally and globally. It has few prominent MoU's with top MNC's and Centre of Excellence established along with few Startup incubators with 10 startups under it. The college has much such collaboration and has good rate of placements and is associated with many reputed MNCs functioning in India. These companies offer internships to students along with pre-placement offers. "To provide accurate mentorship to students, we arrange seminars and programs where industry leaders come and share their knowledge and experiences with our students. Added to this, we focus a lot on faculty training and development as well with various kinds of certifications and assessment programs", said M. Narendra Krishna, Vice Chairman, SASI Institute of Technology & Engineering.

The institution promotes R&D by inspiring students to participate in hackathons and workshops nationally and globally. It has few prominent MoU's with top MNC's and Centre of Excellence established along with few Startup incubators with 10 startups under it

Empowerment through Inspiration

Meka Kranthi Sudha, is the Secretary and Correspondent of Sasi Educational Society. She completed her KG to PG in Sasi Institutions. She completed her Engineering in the ECE stream and got her master's degree in the ECE stream from the University College of JNTU, Hyderabad. After that, she offered her services for the development of Sasi Institutions for two years. Then, she married Sri Meka Narendra Krishna, who is a fervent supporter of women's education, empowerment, and welfare, and committed to fostering the skills and abilities of women. Both of them left comfortable and prosperous careers in the USA and decided to dedicate themselves to strengthening the educational opportunities in rural areas. She has undertaken a government girl's school and is dedicating herself wholeheartedly to enhancing facilities to facilitate better learning outcomes.

Her primary focus lies in promoting awareness about personal hygiene and developing healthy eating habits. Significant days like Children's Day, National Girl Child's Day, and other national days are celebrated with the children chiefly to bring awareness to their rights and develop their outlook.

Special camps are organized with the help of college Social Service club students. Distributing nutritious food during exams and supplying books, stationery, and supporting materials are some of them to enhance their learning. She is a yoga practitioner and places great importance on integrating yoga into the lives of all students with a particular focus on girls, to promote their health and well-being. She is an organic lover, a fitness freak, and a passionate and positive woman, striving for women's empowerment. Her message to all girls is 'Follow your passion, be prepared to work hard and sacrifice, and above all, and don't let anyone limit your dreams'. Meka Kranthi Sudha is a true inspiration to all the female students studying at the institution. HER

WHAT STUDENTS & PROFESSIONALS NEED FOR A THRIVING CAREER IN BANKING & BFSI

Balasundaram Athreya, President, Manipal Academy of BFSI

Balasundaram Athreya, President, Manipal Academy of BFSI in a recent interaction with Janifha Evangeline, Editor, Higher Education Review provided valuable insights into the most promising career paths in the Banking and BFSI sectors. He emphasized the importance of both technical and interpersonal skills for success in the industry.

Balasundaram Athreya is a seasoned Senior Corporate Management Professional with extensive experience in the Banking, Financial Services, and Insurance (BFSI) sector. He holds a Bachelor of Science (B.Sc), is a Fellow Chartered Accountant (FCA), and is a Cost and Works Accountant (CWA), showcasing a strong educational foundation in finance and management. With over 40 years of cross-functional work experience across India, Kenya, and the UAE, Mr. Athreya has developed a diverse skill set encompassing team building, leadership, organizational development, and operational planning.

What are the most promising career paths in Banking/ BFSI for students and professionals entering the industry today?

Entering the BFSI sector can happen at two levels: frontline entry-level roles or lateral recruitment driven by industry churn. The BFSI landscape includes large universal banks, public and private sector banks, major NBFCs (Non-Banking Financial Companies), MFIs (Microfinance Institutions), and fintech firms catering to niche markets.

With India's economic growth, the BFSI sector offers expanding career opportunities, particularly in retail banking. Unlike the traditional perception of banking as a laid-back job, it has evolved into a customer-facing, sales-driven, and relationship-oriented profession. Professionals with strong communication skills, interpersonal abilities, and a passion for promoting financial literacy can thrive in this industry.

The customer base has also evolved. The lower-income segment remains largely outside equity markets, while the burgeoning middle class is experiencing rising incomes and savings. Many are turning entrepreneurial, especially in tier-B cities. In tier-A cities, increasing income levels are fueling investments in equity and consumption-driven credit. This creates significant demand for professionals in retail and consumer credit, savings and investments, and financial planning.

Sales and customer relationship management remain key areas of growth. However, as the industry expands, there is also a rising demand for professionals in cyber security, operational systems, data privacy, and analytics. Banks handle vast amounts of customer data, making predictive analytics, AI-driven insights, and business intelligence crucial for understanding and anticipating customer behavior.

The BFSI sector is among the largest employers in India, ranking alongside manufacturing and services. While automation may replace some routine tasks, customer-facing roles will continue to grow. Graduates from diverse fields such as commerce, arts, pharmacy, and engineering can find opportunities in BFSI. Public sector bank jobs require clearing simple entrance exams, while private sector roles may require additional training.

Entry-level salaries in BFSI are competitive and often surpass those in lower-tier sales or administrative jobs. Given the financial sector's growth in assets and liabilities, there is a clear demand for skilled professionals. Candidates with strong ethics, regulatory compliance awareness, people skills, and communication abilities can build a successful career in BFSI.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PIONEERS ARE PROS

What technical and interpersonal skills are most valuable for succeeding in this sector? Are there specific certifications or degrees you recommend for students and professionals looking to excel in Banking/BFSI?

In the technology space, data analytics and cybersecurity are essential fields to explore, along with business intelligence. AI is revolutionizing tools across industries, including BFSI, making fintech skills highly valuable. Graduates should invest in a fintech stack that includes basic coding in advanced Java, data analytics tools like Python and R, and cybersecurity and threat analysis tools. These technical skills are acquired through education and are in high demand.

On the people and sales side, strong interpersonal and communication skills are crucial. While technical skills can be learned, sales and relationship management require an inherent ability to influence, engage, and communicate effectively. For instance, programs like the Manipal Academy of Banking offer tailored courses covering product, process, and people management for banking professionals. However, sales professionals should invest in MBAs in Sales & Marketing, sales training, or personality development courses to refine their skills.

Success in financial advisory and banking sales is not just about learning products and processes but about understanding customer financial journeys, cultivating investment behavior over speculation, and upholding high ethical standards. Effective professionals actively listen, build trust, and communicate value clearly. They guide customers through investment, liability, and credit decisions, ensuring structured and ethical financial planning.

Ultimately, technical skills can be taught, but strong interpersonal skills come from within. While courses help refine communication and sales strategies, a successful financial professional must inherently be a people-oriented, ethical, and patient communicator who prioritizes the long-term financial well-being of customers over short-term gains.

What strategies would you suggest for young professionals to advance from entry-level roles to leadership positions in banking or BFSI?

Once inside the BFSI industry, numerous opportunities exist for growth. Major banks, MFIs, and NBFCs have structured Learning & Development programs that provide continuous education. However, advancing to leadership roles requires more than formal education. While understanding products, markets, and risk concepts is essential, professionals must also master relationship management, compliance, and business process integration to drive growth effectively.

Leadership comes from expanding client relationships, enhancing compliance, and leveraging processes for business growth. Experience, combined with L&D programs, helps professionals move forward. Beyond company training, staying informed about global financial trends is crucial. The BFSI sector is increasingly global, influenced by U.S. Federal policies, Japan's interest rates, and European geopolitical factors. A strong reading habit - following top financial newspapers, global journals, and industry reports - is key to understanding these market shifts.

Unlike technical skills, leadership is shaped by vision, industry awareness, and strategic thinking. Success depends on engaging in insightful conversations rather than accumulating certificates. While industry-recognized certifications like CIIB, CFP, NISM, and SEBI certifications add value, they are not the sole drivers of leadership growth. Real progress comes from benchmarking industry trends, analyzing market shifts, and contributing to strategic discussions. Staying informed allows professionals to anticipate changes, propose solutions, and execute strategies effectively. Leaders are active listeners who synthesize industry insights into actionable strategies.

For instance, when a bank launches a new credit card, professionals involved in sales, marketing, and partnerships must understand industry trends, past performance, and competitive strategies. Their ability to contribute informed perspectives in meetings strengthens their leadership potential.

Leadership is not just about overseeing execution; it's about visioning, staying ahead of industry shifts, and integrating insights into business strategy. Keeping up with thought leaders like Tamol Bandyopadhyay or top financial experts enhances the ability to engage with banking leaders and CLOs, helping identify talent gaps and industry transformations.

Ultimately, progressing in BFSI is about continuous self-education, global awareness, and strategic thinking - not just formal degrees. Those who actively read, listen, and engage with industry insights will leapfrog into leadership faster than those who rely solely on structured learning. HER

TULA'S INSTITUTE

AN INCUBATOR FOR REVOLUTIONARY IDEAS & TECHNOLOGICAL BREAKTHROUGHS

The contemporary world is shifting rapidly, translating to Research and Development (R&D) institutes abandoning conventional 'teaching' and becoming centers for innovations. These institutes that promote advanced research in collaboration with the industry and entrepreneurial activity nurture students to address global challenges. An ecosystem that incorporates academic discipline with worldly activities is required to produce a self-sufficient professional. Graduates must seek jobs and act as pioneers, decision-makers, and issues in the ever-growing field of technology, science, and industry. One such institute dedicated to producing world-class professionals while promoting innovation and research is Tula's Institute.

In Dehradun, a city known for educational excellence, Tula's Institute has redefined higher learning. Founded in 2006 by Sunil Kumar Jain, it bridges academia and industry, fostering visionaries and innovators. With a focus on research, entrepreneurship, and industry-aligned education, this institute nurtures talent within the state. Nearly two decades later, it stands as a testament to progressive education, shaping leaders for a dynamic global landscape.

Silky Jain Marwah, Executive Director

Redefining the Educational Landscape

An institution's true success is measured not just by its infrastructure or faculty credentials but by its ability to transform students into adaptable, forward-thinking professionals. Tula's Institute embraces this philosophy, redefining conventional education through a student-centric approach that prioritizes experiential learning over rote memorization. Here, education is not confined to textbooks but extends into real-world problem-solving, innovation, and industry-driven competencies.

At the core of this transformation is the institute's 'happiness quotient' ideology, a belief that academic excellence must go hand in hand with personal growth and engagement. The campus fosters an atmosphere where students remain motivated, inquisitive, and excited about learning. Recognizing the widening gap between academia and industry, Tula's Institute has established an advanced Placement and Industry Collaboration Cell that does more than facilitate job opportunities. This unit actively partners with leading corporations to identify emerging skill gaps, curate industry-relevant curriculum modules, and implement specialized training programs.

With this vision, Tula's Institute has introduced cutting-edge courses in Artificial Intelligence, Machine Learning, and Cybersecurity. Collaborations with top tech firms provide hands-on exposure, ensuring graduates emerge as industry-ready professionals prepared to lead in an evolving global landscape.

Pioneering Research and Development

A truly distinguished institution does not merely disseminate knowledge, it creates it. Tula's Institute has embraced this philosophy, positioning itself as a powerhouse of research

and development, where academic curiosity seamlessly converges with industrial innovation. A defining moment in this journey came in 2022 with the establishment of the Center for Innovation, Research, and Entrepreneurship (CIRE), a state-of-the-art facility designed to cultivate groundbreaking research and transformative advancements. At this institute, students and faculty collaborate to push the boundaries of conventional knowledge, fostering an ecosystem that nurtures both discovery and application.

Strategic alliances with prestigious institutions have further amplified the scope of research at Tula's Institute. These collaborations grant students access to cutting-edge developments, immersive internships, and live industry projects, equipping them with the confidence to take their innovations beyond academic settings. From pioneering sustainable technologies to exploring AI-driven analytics and drone applications, students are actively contributing to solutions with global relevance.

This research-driven ethos is further strengthened by specialized laboratories, including the Cyber-Physical System Lab, AICTE Idea Lab, and the Technology Business Incubator (TBI), which has already nurtured over ten promising startups, transforming innovative ideas into thriving enterprises.

> Tula's Institute redefines research and development, transforming ideas into breakthroughs and students into innovators, shaping the future of technology, entrepreneurship, and industrial progress

Entrepreneurship The Pulse of Future-Ready Education

Innovation alone does not drive success, the ability to commercialize and sustain it is what transforms a researcher into an entrepreneur. "Our institute fosters an entrepreneurial spirit, ensuring students are active creators of change. The AICTE Idea Lab and Technology Business Incubator provide mentorship, funding, and industry collaboration, guiding our students through product development and startup management. With strong industry linkages, we aim to empower students to turn ideas into thriving enterprises", says Silky Jain Marwah, Executive Director,Tula's Institute.

With great power comes great responsibility, and Tula's Institute recognizes its role in fostering research that is not just innovative but also ethically sound and sustainable. The institution upholds stringent ethical standards in all R&D activities, ensuring that research is conducted responsibly and with a clear vision for societal betterment. The promotion of eco-friendly materials, energy-efficient technologies, and responsible AI practices forms an integral part of the research ethos at this institute. The Intellectual Property Rights (IPR) Cell provides students and faculty with the necessary support to patent their innovations, ensuring their ideas are not only protected but also aligned with global standards of sustainability and ethics.

A Legacy in the Making

The true legacy of an institution is not defined by the buildings it constructs but by the minds it shapes and the impact it leaves on the world. Tula's Institute has already carved a niche for itself in the realm of higher education, but its journey is far from over. As it continues to push the boundaries of research, forge new industry partnerships, and cultivate an environment of academic excellence, its vision remains steadfast, which is to emerge as a globally recognized hub producing world-class professionals, fostering innovation, and redefining the future of education.

In conclusion, Tula's Institute serves as a landmark in promoting modernization, research, and entrepreneurship while developing professionals who are ready for the industry. It continues to inspire students to take global initiatives with a positive impact through innovative leadership with a vision focused on the future. HER

ALIGNING ACADEMIC CURRICULA WITH REAL-WORLD SKILLS FOR WORKFORCE READINESS

Ruhie Pande, Group CHRO at Sterlite Power

In an exclusive interaction with Higher Education Review Magazine, Ruhie Pande, Group CHRO at Sterlite Power, shared her views and thoughts on what changes academic curricula can incorporate to prepare students for the challenges of working in a globalized economy as well as how academia can shift from a one-time education model to a lifelong learning ecosystem that supports workforce adaptability.

Ruhie Pande,
Group CHRO

She is a seasoned leader with over 20 years of experience spanning financial services, real estate, fashion retail, IT, and FMCG. Renowned for her empathy-driven leadership, she has a proven track record of fostering high-performance cultures. In her previous role at Godrej Capital, she played a pivotal role in strengthening the organization by strategically identifying and acquiring top talent.

Many academic institutions struggle to balance theoretical knowledge with practical skills, leaving graduates underprepared for the workforce. How can educational institutions collaborate with industry leaders to ensure curricula remain relevant to evolving job market demands?

The job market is rapidly evolving, and employers are seeking candidates who can handle their job roles effectively and efficiently. Theoretical knowledge alone is insufficient for organizations. I believe educational institutions should be more diligent in preparing students holistically for the competitive job market.

For example, a great teacher not only lectures on a subject but also helps students absorb the learning and apply it to their lives. They plan lessons, adapt their modules for easy understanding, and offer extra help to students, ensuring they not only excel in exams but also in life.

Similarly, educational institutions should provide students with both practical and theoretical knowledge

to secure good jobs. They should also teach interpersonal skills and prepare students to face obstacles and challenges without being overwhelmed, ensuring a successful career trajectory. Institutions can update their curricula to expose students to real-world knowledge of relevant industries.

In today's dynamic economy, continuous upskilling has become essential, yet many institutions focus solely on foundational education. How can academia shift from a one-time education model to a lifelong learning ecosystem that supports workforce adaptability?

In today's fast-paced world, where automation is rapidly taking over, traditional job roles face uncertainty and the risk of becoming redundant. Upskilling and reskilling have become prevalent trends of the decade, and even the World Economic Forum has dubbed the 2020s as 'the decade of upskilling.' I think as we move towards a more technologically advanced professional ecosystem, employers are looking for candidates who are versatile and possess varied skills. Since the candidate pool is extensive, organizations are not sold on just generic skillsets; they are seeking proactive individuals who are willing to learn and diversify their skillset to effectively contribute to the industry.

While foundational education is necessary for all students, it is not nearly enough to take on complex opportunities within the current workforce. We're past the era where people had one job role for the entirety of their careers. Academia must align itself with the transformative social and economic forces shaping the 21st century. Academia needs to transition to a lifelong learning ecosystem by offering flexible, ongoing programs, partnering with industries, and emphasizing practical skills alongside theoretical knowledge. This will equip learners with the tools to adapt to the ever-evolving job market.

Hands-on experience through internships not only helps students apply theoretical knowledge but also fosters adaptability to dynamic work environments. What role do internships and apprenticeships play in bridging the gap between academic learning and workplace readiness?

Internships and apprenticeships are not just opportunities for soon-to-be graduating students or recent graduates; they are essential tools for preparing them for the competitive job market. These programs help them hone their skills and test their theoretical knowledge, ensuring they are well-equipped with job-specific knowledge, familiar with industry trends and norms, can develop suitable communication skills, and learn to work effectively in teams. These qualities are not just necessary for the workplace but also helpful in handling personal challenges and tackling difficult situations effectively.

Internships are a vital stepping stone for young individuals transitioning from academia to the formal sector. Candidates, often with little to no workplace experience, can feel overwhelmed in the office environment and struggle to fulfill their work obligations. However, internships provide them with the opportunity to adapt to specific industries and work systems, equipping them to thrive in their future full-time roles.

Hands-on experience through internships not only helps students apply theoretical knowledge but also fosters adaptability to dynamic work environments

With the rise of AI and automation, equipping students with relevant tech skills is no longer optional but essential for workforce readiness. How can academia incorporate emerging technologies and trends into their programs to prepare students for future industrydisruptions?

AI literacy has become an increasingly in-demand skill in many corporations. It is clear that AI is a crucial part of the evolving workspace, and not knowing how to navigate AI effectively to carry out generic tasks can be a skill gap that employers may not overlook. While having knowledge of your job roles is great conduct, freshers must be ready to

face a dynamic working environment and accept learnings and challenges to grow personally and professionally. AI and automation are useful tools that can streamline a lot of things; hence, knowing how to use them for benefit will only make jobs easier. Transformation is a constant in every area, even academia. Educational institutions must integrate the advancements into their systems to familiarize students with the world of automation.

Academic institutions can play a pivotal role in preparing students for the future by embracing technological advancements. This can be achieved by offering specialized courses in AI and machine learning, fostering interdisciplinary collaboration, integrating project-based learning, and providing hands-on experiences. Investing in state-of-the-art infrastructure and high-speed internet connectivity is imperative to support cutting-edge research and online learning. Strong industry partnerships, through internships and co-op programs, can bridge the gap between academia and industry. Additionally, student support systems, such as mentorship, career counseling, and lifelong learning initiatives, empower students to thrive in the dynamic technological landscape.

With globalization, the workforce needs cross-cultural competencies and an understanding of global business environments. What changes can academic curricula incorporate to prepare students for the challenges of working in a globalized economy?

In today's interconnected world, it's more important than ever for students to develop a global perspective. To prepare them for this future, we can transform the academic curriculum by incorporating courses that promote cross-cultural understanding and global competence.

Imagine a world where students learn about intercultural communication, global ethics, and international business. They could study global economics, comparative management, and multiple languages, including those widely used in international business. By integrating technology into the curriculum, we can equip them with skills in data analytics, artificial intelligence, and digital marketing. This is an opportunity to empower our students to think critically, solve problems, and embrace entrepreneurial thinking. We can challenge them to analyze complex global issues and develop innovative solutions. HER

NAVIGATING THE FUTURE OF DATA SCIENCE

Dr Bhuvanesh Singh, Data Scientist, Ford Motor Company

Dr Bhuvanesh Singh, Data Scientist, Ford Motor Company in a recent interaction with Higher Education Review, shared his views on the future of data science in India, the trends or developments shaping its evolution in the coming years, the future of data science on the global stage and more. He is a data science enthusiast with an MS in Data Science from the USA and a PhD in Machine Learning. Currently working at Ford Motor Company, he leverages data to optimize vehicle performance and enhance fleet management dashboards.

Having worked on a state government-funded project on fake news detection, could you tell us more about that experience and the significance of that work?

Absolutely, the project was part of a state government initiative in India aimed at combating the spread of fake news on social media platforms. My role involved developing a multi-modal framework that combined natural language processing (NLP) and computer vision techniques to detect manipulated images and misleading information. The project was quite innovative, and we even filed a patent for our approach, which used a custom convolutional neural network (CNN) with a self-attention module to achieve state-of-the-art accuracy. This work is crucial because fake news has the potential to mislead millions of people, creating social unrest and spreading misinformation at an alarming rate.

What do you think is the impact of fake news on social media platforms today?

The impact of fake news on social media is profound and far-reaching. It can influence public opinion, sway elections, incite violence, and generally sow discord in society. The algorithms used by social media platforms are designed to prioritize engagement, which often means that sensationalist content—whether true or not—gets amplified. This makes it incredibly challenging to control the spread of fake news. The consequences are not just misinformation but a fundamental erosion of trust in the information we consume.

Looking ahead, what do you see as the future of data science on the global stage?

The future of data science globally is incredibly promising. We're seeing data science permeate every industry, from healthcare to finance to automotive, and the possibilities are endless. As technology advances, particularly with AI and machine learning, data science will become even more integral to decision-making processes. We'll likely see more automation, where data-driven models help businesses operate more efficiently and predict outcomes with greater accuracy. On a societal level, data science will continue to play a crucial role in addressing global challenges like climate change, public health, and economic inequality.

How do you envision the future of data science in India, and what trends or developments do you see shaping its evolution in the coming years?

India has a unique position in the data science landscape. With a large pool of talent, a growing tech industry, and an increasing focus on digital transformation, the potential is immense. I believe we will see India becoming a global hub for data science innovation, particularly in sectors like healthcare, agriculture, and finance. There is also a growing awareness of the importance of data ethics and privacy, which will shape how data science is practiced in the country. The government's push for digital initiatives will further accelerate the adoption of data-driven practices across various industries.

What advice would you give to someone just starting their career in data science?

My advice would be to stay curious and never stop learning. Data science is a rapidly evolving field, and what is cutting-edge today might be outdated tomorrow. Focus on building a strong foundation in the basics — statistics, programming, and domain knowledge because these are the skills that will help you adapt to new tools and technologies as they emerge. Also, do not be afraid to tackle real-world problems, even if they seem daunting at first. The best way to learn is by doing, and the more experience you gain, the more valuable you become. Finally, always keep the impact of your work in mind. Data science is a powerful tool, but it is most effective when used to create positive change. HER