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## commends measures to approvals in devices sector

for the Department of Health for the year 2025-26, took note of various initiatives such as implementation of MD online portal, creation of a Medical Devices Vertical, establishment of testing laboratories and notified bodies and launch of MedTech Mitra platform to support innovators.

While these measures are commendable steps towards improving regulatory efficiency and transparency, the Committee observes that persistent industry concerns remain regarding delays, inconsistent timelines, and lack of end-to-end real-time tracking of licensing applications, it observed.

"The Committee, therefore,

recommends that the Department must ensure the complete digitization and automation of the licensing process through a unified and integrated digital platform linking central and state licensing authorities, with mandatory public disclosure of application status, query logs, and processing timelines," said the Panel headed by Member of Parliament Prof. Ram Gopal Yadav in the report presented to the Rajya Sabha on Dec 11.

"The Committee further urges that a robust performance monitoring and accountability framework be instituted to track adherence to defined service timelines and penalize undue delays," it added. ♦

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# Building a stronger pharma profession for future

Dr. Sanjay Agrawal

**M**ANY institutions continue to rely on outdated teaching methods, limited technological integration, uneven infrastructure, and insufficient exposure to real-world practice. While the sector is moving ahead with advanced therapies, digital transformation, and global regulatory expectations, the academic environment often remains rooted in traditional, theory-heavy learning.

This gap between education and practice impacts not just employability but the overall quality and confidence of the future workforce. India produces thousands of pharmacies graduates every year, but without modernised training, hands-on experience, and industry-aligned learning environments, many students struggle to transition into the highly dynamic roles the pharma profession now demands.

Strengthening pharmacy education is therefore not merely an academic reform - it is a long-term investment in national health, scientific excellence, and global competitiveness. Enhancing the quality of training, empowering faculty, upgrading infrastructure, and integrating emerging technologies can transform students into practitioners, innovators, and leaders capable of contributing meaningfully to both national and global healthcare landscapes.

This article examines the current state of pharmacy education in India, highlights the gaps and opportunities, and outlines the reforms needed to shape a stronger, more future-ready pharma profession.

## Pharmacy education: A pillar with cracks

India has more than 3,000 pharmacy institutions, producing graduates at a scale unmatched by most countries. On paper, this should be our biggest advantage - a large, diverse, and technically trained workforce ready for industry or patient care.

**But numbers alone don't guarantee excellence.**

## 1. Curriculum misalignment with industry needs

The pharmaceutical industry has rapidly moved toward advanced manufacturing, digital transformation, stringent regulatory norms, and global supply chains. Meanwhile, many students still learn through static syllabi, limited lab expo-

sure, and outdated practical training. The gap widens each year.

## 2. Uneven quality across colleges

Top-tier institutions offer exceptional training, research output, and faculty expertise. But a large segment struggles with:

- Insufficient lab infrastructure
- Lack of qualified faculty
- Poor industry collaboration
- Minimal focus on experiential learning

This inconsistency impacts the profession as a whole.

## 3. Limited research culture

Despite India's leadership in generics and vaccines, academic research output is significantly lower than global standards. Many colleges lack funding, mentorship, or equipment to promote meaningful research.

## 4. Weak clinical integration

Hospital pharmacy, clinical pharmacy, and community pharmacy remain under-developed compared to international models. Students rarely experience real patient environments, leading to poor understanding of drug therapy management and healthcare systems.

## 5. Faculty overload

Young educators often handle heavy teaching loads, administrative work, and limited opportunities for skill development. Without strengthened faculty support, meaningful reform becomes difficult.

These gaps don't reflect a lack of talent - they reflect a lack of alignment.

## Why reform matters: Future pharmacist is changing

The pharmacist's role today is far more dynamic than it was even a decade ago. What was once viewed as a profession centered primarily around dispensing has now expanded into a wide spectrum of responsibilities that span drug discovery, regulatory affairs, pharmacovigilance, patient safety, manufacturing, quality assurance, and clinical decision-making.

Pharmacists contribute to therapy optimization, participate in community and hospital pharmacy services, and play key roles in medical writing, scientific communication, and public health. With the rise of health technology, digital health systems, and data-driven care, their involvement is becoming even more critical.

To perform these diverse and evolving roles with confidence, students require far more than academic theory. They need a strong scientific foundation, the ability to analyse and solve problems, and exposure to real-world settings where they can observe, apply, and refine their skills. Beyond technical competence, future pharmacists must carry a mindset built on continuous learning, adaptability, and professional responsibility.

If pharmacy education does not evolve at the pace of the profession, the gap between academic preparation and industry expectations will only widen. Without timely reform, the professional identity, effectiveness, and global competitiveness of Indian pharmacists risk falling behind.

## Strengthening pharmacy education: Path forward

Reforming pharmacy education is not a one-point solution; it is a multi-layered process. The change must begin at the foundations, strengthen through systems, and ultimately blossom into professional excellence. A future-ready pharmacy workforce requires both structural reforms and cultural shifts across institutions, faculty, and learning environments.

## 1. Modernising curriculum

The curriculum must evolve in both content and approach. Today's pharmaceutical landscape demands exposure to contemporary Good Manufacturing Practices (GMP), updated global regulatory frameworks, and Quality by Design (QbD) principles. Students also need training in patient-oriented practices, digital literacy, pharmacoeconomics, and healthcare systems.

Integrating case-based and problem-based learning ensures that theory connects meaningfully with real-world scenarios. A curriculum built for the modern world should empower graduates to step confidently into global roles with competence and clarity.

## 2. Strengthening faculty development

Education improves only when educators feel empowered and supported. Faculty must have access to regular pedagogy workshops, robust research support, and opportunities to earn industry-relevant certifications. Participation in academic conferences and international training programs helps broaden their horizons

and deepen their expertise. When faculty members grow, innovate, and stay updated, the entire education system naturally rises with them.

## 3. Boosting research and innovation capacity

Research should not remain confined to postgraduate levels - it must become a continuous part of academic culture. Encouraging undergraduate students to participate in interdisciplinary research builds early scientific curiosity and strengthens analytical skills.

Institutions should promote collaboration with biotech companies, pharma industries, and research organisations. Providing access to research grants, state-of-the-art equipment, and opportunities for publication and patent filing will help nurture a generation of innovative, industry-ready scholars.

## 4. Creating stronger industry-academia partnerships

Students learn best when theory meets practice. This makes strong industry-academia collaboration essential. Institutions must facilitate internships, apprenticeships, and meaningful industrial training where students gain hands-on exposure.

Guest lectures by experts, joint certification programs, and industry-sponsored laboratories can bridge the gap between academia and workplace expectations. Real-time case studies allow students to understand industry challenges and develop the problem-solving mindset demanded by modern pharmaceutical roles.

## 5. Embracing digital learning tools

Technology has become a powerful equaliser in education. Virtual labs, simulation platforms, and e-learning modules can enhance practical understanding and expand access to high-quality learning resources.

Digital reference systems and interactive tools support self-paced learning and help students visualise complex scientific concepts. By adopting digital tools widely, pharmacy institutions across the country can ensure that learners - regardless of geography - receive consistent, cutting-edge education.

## 6. Improving clinical and community pharmacy training

To strengthen India's patient-

care landscape, pharmacy students must gain real exposure to clinical environments. Participation in hospital rounds, involvement in drug therapy monitoring, and hands-on patient counselling can build practical competence and confidence.

Community health programs and medication management initiatives help students understand public health needs and the societal impact of their profession. Such exposure not only enriches learning but also deepens respect for the pharmacist's role in healthcare delivery.

## 7. Standardising infrastructure across institutions

A strong education system requires consistent, reliable infrastructure. Every pharmacy institution, regardless of location or scale, should meet minimum standards for laboratories, libraries, equipment, and digital access.

Adequate faculty-to-student ratios must be ensured to maintain quality teaching and mentorship. When infrastructure is standardised, the profession gains credibility, students learn more effectively, and academic outcomes become more uniform across the country.

## Role of young faculty: A silent force with massive potential

Young educators are shaping the next generation of pharmacists, often working with limited resources but an abundance of dedication. Their enthusiasm, adaptability, and comfort with modern tools position them as powerful change agents in pharmacy education. They bring fresh ideas into the classroom, connect naturally with students, and understand the evolving expectations of the profession.

To empower young faculty, institutions must create an environment where their growth is prioritised. Reducing administrative overload allows them to focus on teaching and research. Encouraging experimentation in classroom methods helps them innovate and deliver more engaging learning experiences.

Providing mentorship opportunities connects them with senior experts who can guide their professional journey, while recognising their contributions boosts morale and strengthens commitment. Supporting their research

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A SPECIAL FEATURE

# Empowering young educators uplifts academic ecosystem

CONTINUED FROM p16

initiatives—through funding, resources, and collaborations—enables them to advance knowledge and inspire students through active inquiry.

When young faculty thrive, the ripple effect is immediate and transformative. Students receive education that is current, energetic, and deeply relevant to the realities of the profession. Empowering young educators ultimately uplifts the entire academic ecosystem and builds a stronger foundation for the future of pharmacy in India.

## Building a Stronger Pharmacy Profession

The pharmacy profession is

more than an academic degree—it is a commitment to public health, scientific integrity, and ethical care. A robust education system strengthens every pillar of the profession.

### 1. Enhancing professional identity

Students must be trained to see themselves not simply as job-seekers but as:

- Health professionals
- Scientific thinkers
- Ethical guardians
- Innovators in patient care

A strong professional identity boosts confidence, performance, and long-term growth.

### 2. Encouraging lifelong learning

With new technologies, thera-

pies, and regulations emerging every year, the pharmacist of tomorrow must adopt continuous learning as part of the profession.

### 3. Strengthening ethical foundations

Integrity is the heart of pharmacy. Students should graduate with a deep understanding of:

- Ethical practices
- Responsible research
- Patient rights
- Regulatory compliance

An ethical profession earns public respect and global credibility.

### Conclusion: A future worth building

India has everything it needs

to lead the next chapter of global pharmacy—talent, industry strength, scientific capability, and an evolving healthcare landscape. But the foundation must begin at the classroom level.

Strengthening pharmacy education is not just an academic reform; it is an investment in national health, global contribution, and professional excellence.

If we modernise our teaching, empower our educators, collaborate more deeply with industry, and prioritise real-world learning, India can nurture pharmacists who stand tall anywhere in the world.

The future of the pharma profession is bright—but it de-

pends on how courageously and sincerely we transform education today. With commitment, innovation, and unity of purpose, India can build a workforce that the world recognises not just for quantity, but for quality, compassion, and expertise.

The journey starts now, and the responsibility belongs to all of us—educators, institutions, industry leaders, students, and policymakers. Together, we can elevate pharmacy education to a level where every graduate proudly represents India on the global stage. ♦

(The author is Scientific Advisor, ALKOMEX GBN PHARMA GROUP U.S.A.)

# Sustainability our responsibility

CONTINUED FROM p15

IPC is committed to adopting these evolving models, ensuring that engagement remains dynamic, accessible, and forward-looking. However, in my personal opinion, the in-person mode is always preferable, as it adds a human touch to future prospects and creates better opportunities for building lifelong relationships.

## What do you look for in exhibitors and participants?

We look for intellectual leadership, originality, innovation and collaboration. We invite exhibitors and participants to contribute in advancing pharmaceutical manufacturing & research, pharmacy practice, education, medical device manufacturing and patient care. Those presenting impactful research, innovative products, or transformative ideas, and those leveraging AI and technology in the healthcare system find an ideal platform at the IPC.

A key highlight of this Congress will be the presence of global leading scientists working in AI and related fields, offering attendees a valuable opportunity for direct interaction.

We value individuals and organizations who not only innovate but also inspire others to think differently. The emphasis is on open dialogue and shared learning, enabling professionals to collectively shape the future of healthcare.

## What significant trends are shaping pharmacy education and the pharma industry?

The profession is undergoing rapid transformation in the terms of technology and skills. Key trends include AI-powered

learning, competency-based curricula, digital manufacturing, medical device manufacturing, regulatory modernization, and an increased focus on sustainability and green practices.

Education and industry are converging like never before creating professionals who are globally competent, ethically grounded, and technologically empowered.

India's pharmaceutical sector is aligning academic outcomes with industrial needs, preparing a generation of pharmacists ready to lead in a globalized healthcare environment.

There is a huge role of technology, AI, and machine learning in pharmacy education and R&D. In fact, AI and machine learning (ML) are revolutionizing both research and education. In academia, AI facilitates virtual laboratories, immersive e-learning platforms, and personalized instruction. In R&D, it accelerates drug discovery, formulation design & optimization and clinical trial optimization, offering deeper insights and higher efficiency.

AI is no longer futuristic; it is foundational. It is redefining how we learn, teach, and innovate. By integrating these technologies, the pharmaceutical community is fostering precision, efficiency, and data-driven excellence across the value chain.

## In an age of climate change, how do you view sustainability in pharmacy education and the industry?

Sustainability is now central to both academic and industrial practice. Institutions are implementing eco-conscious curricula, green labs, and digital solutions to reduce waste and improve efficiency. Meanwhile, the industry

is investing in green chemistry, renewable energy, and ethical sourcing to minimize its environmental footprint.

Hosting the 74th IPC at a LEED-certified venue reinforces this commitment. Pharmacy must heal not just people, but the planet. Sustainability is our collective responsibility. The Congress encourages all stakeholders to embed environmental stewardship in every layer of education, research, and manufacturing.

## What is your key message to this year's attendees of the event?

Let us come together to embrace innovation & AI, uphold ethical standards, and empower the next generation of pharmacists. The 74th IPC is more than an event; it is a call to action for every professional who believes in the transformative power of science. By fostering inclusivity, collaboration, and excellence, we can shape a future defined by integrity, innovation, and public health impact.

The future of IPC leadership demands vision, adaptability, collaboration, sustainability and strong ethical grounding. Leaders must guide the profession through technological advancement with empathy, foresight, and a spirit of unity.

True leadership is about inspiring others to lead with courage, creativity, and conscience.

Future IPC leaders should embrace modern progressive technological proficiency while staying rooted in professional ethics, ensuring that the organization continues to serve as a beacon for progress, education, and societal contribution. ♦

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