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AGRITECH SOLUTIONS CULTIVATING GROWTH

Over the last few years, there has been a phenomenal surge in the number of agritech start-ups in India. From a mere 1,000 in the year 2019, the agritech sector in India today boasts nearly 3,000 start-ups. But experts still see tech adoption in the sector to be at a very nascent stage.

The reason for this is fairly simple: India is home to 15 crore farmers, of whom only about 2 crore – that's 15 percent of all farmers – use agritech solutions in some way or the other, said ThinkAg co-founder Hemendra Mathur.

“Though the figure appears modest, it marks a significant upturn for the sector, occurring within just the past three years,” Mathur said while speaking recently at TechSparks 2023.

He further noted that, globally there are approximately 50 crore small landholding farmers and most tech innovations in India are tailored for such a demographic, leaving a significant opportunity for tech solutions to be exported around the world.

Meanwhile, within the next 10 years, almost 90 percent of Indian farmers will possibly use technological solutions on their lands owing to improved internet access, availability of smart phones and reduced technology costs, Mathur said.

However, it isn't an easy ride. Farmers don't adopt any technology that's offered to them. They need to be provided solutions directly related to their problems, else they won't show any interest.

Even getting hold of farmers to understand a product is extremely tough. “The entire ecosystem needs to change,” said Amrender

Singh, co-founder of DeHaat, adding that aside from the farmers, agri-input manufacturers, processors and institutions also need to adopt technology.

But then again, the Indian agritech start-up space has grown remarkably, with less than 500 start-ups in 2017. “What's intriguing is that a majority of today's entrepreneurs in this field come from non-farming backgrounds. They identify the issues and actively devise solutions, significantly altering the complexion of the sector for the better,” according to Mathur.

“My guess is that in the next seven to eight years this sector will see at least 10,000 agritech start-ups. Agritech is one of the few sectors which has space for everyone and there's no dearth of opportunity,” he added.

India's agriculture GDP share in 1990-91 was a whopping 35 percent. It's a different matter that share has fallen to 15 percent in 2022-23 due to the rapid growth of the industrial and service sectors during this period. But the agriculture sector in India still provides employment to 45 percent of the country's workforce.

Moreover, the Total Addressable Market (TAM) for agritech start-ups to explore is about 14 crore hectares, according to DeHaat's Singh. And that is truly vast.

So, in this issue of Education Post, we explore how Indian students can make fantastic careers in the agritech sector while realizing the importance of sustainability in agriculture.

Happy reading.

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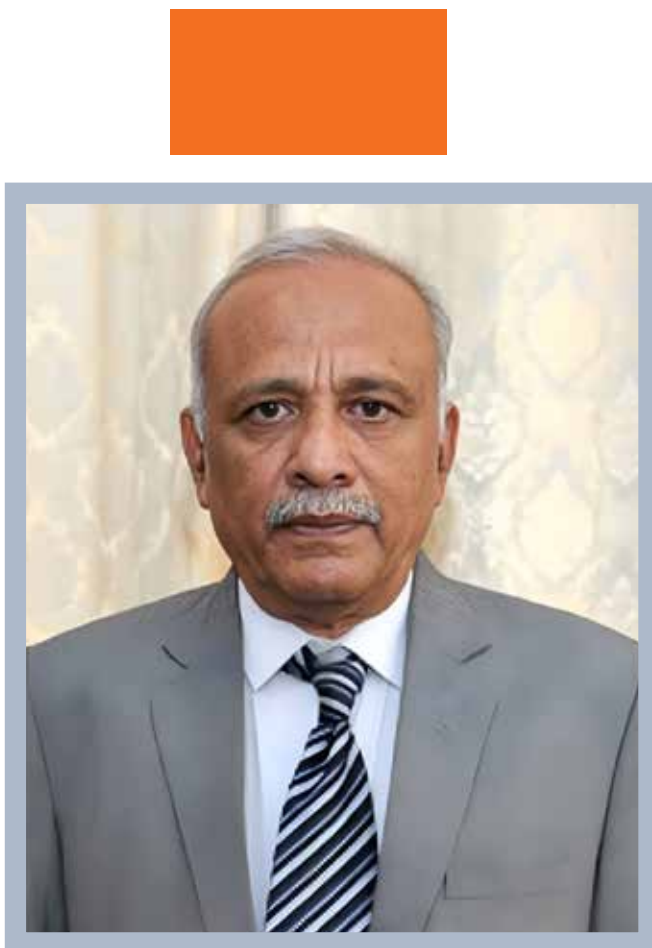
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EMPOWERING SMALL-SCALE FARMERS IN TRIBAL REGIONS IS CRUCIAL FOR AGRICULTURAL DEVELOPMENT

Dr. Anupam Mishra, Vice Chancellor of Central Agricultural University, Imphal articulates key moments that inspired his commitment to practical, sustainable, and globally informed agricultural education in a freewheeling chat with Education Post's **Prabhav Anand**.

technologies, such as AI and precision farming, the following subjects have been introduced into the curriculum at PG and PhD levels

M. Tech.

- Applied Instrumentation in Farm Machinery
- Machinery for Precision Agriculture
- Mechatronics and Robotics in Agriculture
- Computer-Aided Design of Machinery

PhD

- Advances in Machinery for Precision Agriculture
- Advances in Farm Machinery and Power Engineering

To prepare our students for the future of agriculture, we've integrated AI and precision farming into our curriculum. We offer specialized courses on these topics, provide access to cutting-edge equipment, and encourage research projects in collaboration with industry partners. By doing so, we ensure that our graduates are well-equipped to harness modern technologies and drive innovation in the agriculture sector.

Collaboration between academia and industry is vital for bridging the gap between theoretical knowledge and practical applications. How is Central Agricultural University fostering partnerships with multinational corporations to enhance students' exposure to real-world challenges in agriculture?

CAU recognizes the significance of academia-industry collaboration in shaping well-rounded agricultural professionals. We actively foster partnerships with multinational corporations through various channels. These include internship programs, joint research projects, and corporate-sponsored initiatives. Such collaborations not only enhance students' exposure to real-world agricultural challenges but also provide them with hands-on experience, enabling them to bridge the gap between theoretical knowledge and practical applications effectively. Under IDP-NAHEP of ICAR funded by

Your extensive experience in the field of agriculture is well-known. Could you share some pivotal moments from your journey that have shaped your vision for agricultural education in India?

My journey in agriculture has been filled with pivotal moments, but a few stand out. First, my early years working on a family farm taught me the importance of hands-on learning. Later, my research on sustainable farming practices highlighted the need for modernization in Indian agriculture. Finally, collaborating with experts and witnessing successful initiatives abroad reinforced the importance of innovation in agricultural education in India. These experiences have shaped my vision for more practical, sustainable, and globally informed agricultural education in the country.

The agricultural sector is undergoing significant technological advancements. How is your university, CAU, incorporating modern technologies, such as AI and precision farming, into the curriculum to prepare students for the future of agriculture?

At CAU Imphal, we recognize the importance of staying at the forefront of agricultural technology. So, to impart knowledge and skill in the area of modern



World Bank the University has exposed 154 students to various International Institutes in Southeast Asian countries mainly for enhancing the entrepreneurial competence. Moreover, 48 faculty members of the university also underwent international training at institutes and collaborative projects have been worked out. The university has also signed MoU's with more than 50 reputed institutes/industries in the country and four international institutes. Currently, process is going on for signing of MoU with six institutes abroad.

Small-scale farmers constitute a significant portion of the agricultural workforce in many countries. Specially in Mizoram state where tribal people have a good majority. How can these farmers be empowered with technology and knowledge

to enhance their productivity and improve their livelihoods, thereby contributing to the overall agricultural economy?

Empowering small-scale farmers, especially in tribal regions like Mizoram, is crucial for agricultural development. To enhance their productivity and livelihoods, a multifaceted approach is needed. This includes providing tailored training programs on modern farming techniques, promoting the adoption

of technology for precision agriculture, and facilitating access to credit and markets. Additionally, forming cooperatives and self-help groups can help small-scale farmers pool resources and knowledge, making them more resilient and better integrated into the agricultural economy. Ultimately, this empowerment can lead to improved livelihoods and contribute to the overall growth of the agricultural sector.

Sustainable agriculture is a key focus in today's global discussions. What do you believe are the essential practices and policies that nations should adopt to promote sustainable farming, balancing the needs of the present without compromising the ability of future generations to meet their own needs?

Sustainable agriculture is vital for our future. Nations should adopt practices and policies that prioritize the following:

Crop Diversity: Encouraging diverse cropping systems helps reduce reliance on single crops and minimizes the risk of crop failure.

Conservation Tillage: Promoting reduced tillage techniques helps preserve soil health and reduce erosion.

Organic Farming: Supporting organic practices reduces the use of harmful chemicals, benefiting both the environment and human health.

Water Management: Implementing efficient irrigation methods and water conservation measures is essential to prevent water scarcity.

Agroforestry: Integrating trees and shrubs into farming systems helps improve soil fertility, provide shade and store carbon.

Research and Education: Investing in research and education programs to disseminate sustainable farming practices.

Policy Incentives: Governments should provide incentives and subsidies for sustainable farming practices while discouraging harmful ones.

By embracing these approaches, nations can ensure that they meet the needs of the present without

compromising the ability of future generations to do the same.

The cultural sector often faces challenges related to market access and fair pricing for farmers produce. What measures do you think the government and international organizations should take to ensure that farmers receive fair compensation for their efforts and investments, fostering a more equitable agricultural industry?

Ensuring fair compensation for farmers is essential for a sustainable and equitable agricultural industry. Governments and international organizations should consider the following measures:

Price Stabilization Mechanisms: Implementing price support mechanisms to provide farmers with a minimum guaranteed price for their produce.

Access to Markets: Improving infrastructure and logistics to help farmers access markets efficiently, reducing post-harvest losses.

Fair Trade Practices: Enforcing fair trade regulations and promoting ethical supply chain practices to ensure fair pricing.

Farmer Cooperatives: Encouraging the formation of farmer cooperatives to collectively negotiate prices and share resources.

Financial Support: Providing financial assistance and credit facilities to farmers to help them invest in technology and infrastructure.

Agricultural Extension Services: Offering knowledge and training to farmers on modern practices to enhance productivity and product quality.

Risk Management: Developing insurance programs to protect farmers from losses due to natural disasters or market fluctuations.

By taking these measures, governments and international organizations can create a more

equitable agricultural industry that benefits both farmers and consumers.

Looking ahead, what are your aspirations for the future of agricultural education in India, and how do you envision Central Agricultural University's role in shaping the landscape of agricultural studies and research nationally and internationally?

My aspirations for the future of agricultural education in India are deeply rooted in excellence, innovation, and global leadership. I envision Central Agricultural Universities playing a pivotal role in shaping the landscape of agricultural studies and research both nationally and internationally. This involves:


Quality Education: Striving for world-class education by continually updating curricula, fostering research, and providing students with cutting-edge knowledge and skills.

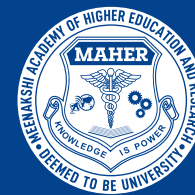
Research Innovation: Promoting a culture of research excellence that addresses India's unique agricultural challenges and contributes to global solutions.

Global Collaboration: Collaborating with international institutions to exchange knowledge, best practices, and research findings.

Technological Advancements: Staying at the forefront of agricultural technology and incorporating it into our teaching and research programs.

Outreach and Extension: Extending our expertise to local farming communities, supporting their growth and development.

By achieving these objectives, Central Agricultural University, Imphal, can lead the way in shaping the future of agricultural education in India and contribute significantly to the global agricultural community. 



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HOSPITALITY MANAGEMENT NEEDS TO ADAPT TO HYBRID WORK-LEISURE ENVIRONMENT

"Network with the right kind of people because trust me, it's networking with your peers and your seniors that gets you the new job opportunities", says **Dr. Sarah Hussain**, Former Head of Tourism and Hospitality Management at Jamia Millia Islamia, in an interview with Education Post's **Prabhav Anand**. This quote encapsulates our dialogue, where Dr. Hussain unveils indispensable advice for aspiring professionals in this career field. From dismantling toxic work cultures to fostering a global outlook, her insights serve as a compass in the ever-evolving landscape of travel and hospitality.

Please share some insights from your extensive experience as you were also the Head of the Department of Tourism and Hospitality at Jamia Millia Islamia? How has the field evolved over the years?

Tourism and hospitality management in our country are relatively new. Most universities lacked individuals from a tourism background in their departments until recently. Over time, people have begun completing their PhDs, joining these departments, and propelling education in this field forward. Unlike other countries, this is still a relatively new domain in India. Hospitality education, until a few years ago, operated outside the traditional higher education and university system, functioning more like institutes. However, universities have now started incorporating hospitality and tourism into their curricula, recognizing the importance of these fields for the future.

The inevitability of travel ensures a continuous demand for accommodation, be

it in luxury hotels, smaller homestays, or guesthouses. People will always seek places to eat, whether it's home-cooked food or dining in restaurants. The field is ever-evolving, and significant changes have already occurred. The universities have also recognized the job opportunities this area offers, providing instant careers for graduates in tourism and hospitality. The programs are entirely job-oriented, with students readily absorbed into the industry post-graduation.

The youth is increasingly drawn to these departments due to the immediate employment prospects. Notably, the trend has shifted towards home stays, with individuals renting out properties in locations like Himachal for remote work or leisure stays. This evolution has given rise to a booming business in homestays across India. People now seek quieter, warmer, and more sustainable destinations, moving away from conventional tourist hotspots. The shift in preference indicates a significant transformation in the tourism landscape, with a growing interest in serene and eco-friendly locations.

What are some of the key challenges you've encountered while managing a department focused on tourism and hospitality education?

See, one challenge we face is that prospective students often hold preconceived notions about the department's requirements. There's a misconception that only exceptionally smart and articulate individuals with excellent communication skills should pursue this field. This belief deters many potential students who assume it's not a fit for them. It's essential to clarify that our department welcomes individuals of all types – introverts, extroverts, those comfortable with communication, and those who prefer otherwise. Employment opportunities are diverse and cater to everyone's strengths. A lack of awareness about the inclusivity of our field poses a significant challenge.

Once enrolled, students undergo a transformation during industrial training,

becoming more street-smart and independent thinkers. While this is advantageous, it also presents a challenge as they can be resistant to conventional teaching methods. Their exposure to the industrial side makes them adept at reading body language and questioning instructions. This dual-edged nature of quick adaptability can be both a boon and a bane.

Another challenge lies in the insufficient emphasis on research within our field. Tourism and hospitality, still emerging in India, grapple with a dearth of substantial research papers compared to other disciplines. It's crucial for individuals to recognize the importance of rigorous research in establishing the credibility of our field. Encouraging serious research work is pivotal to addressing this challenge.

Furthermore, managing a department that incorporates both hospitality and tourism adds an extra layer of complexity. Hospitality programs demand substantial investments in equipment for kitchens, bakeries, and housekeeping. The heavy financial commitment required often raises skepticism among universities contemplating such investments. While I've successfully navigated this challenge, it remains an overarching concern within our field – the misconception that establishing a hospitality department is straightforward without recognizing the need for extensive infrastructure.

In essence, our challenges encompass dispelling misconceptions about entry requirements, navigating the duality of student adaptability, fostering research culture, and addressing the substantial investments required for hospitality programs.



In recent years, the travel and hospitality industry has undergone significant changes due to technology and changing consumer preferences. How should educational institutions adapt their curricula to prepare students for these shifts?

In recent years, the travel and hospitality industry has undergone significant changes due to technology and changing consumer preferences. Educational institutions must adapt their curricula to prepare students for these shifts. Digital literacy is crucial, and not everyone can upgrade themselves extensively. Faculty members can only upgrade up to a certain level without the necessary infrastructure for digitalization in the industry. The top-tier hotel and travel associations have integrated technology extensively, surpassing what educational institutions can match.

During COVID-19, digitalization witnessed substantial development, enabling students to learn extensively. The marketing landscape has transformed, with AI and virtual reality offering virtual visits to various places. This shift allows individuals to explore destinations like Scandinavia and inspect rooms virtually, offering

a new dimension to the industry. While robots have replaced human roles globally, India's abundance of manpower prevents widespread adoption due to cost considerations.

Teaching technology becomes crucial. Both faculty and industry players need to invest in upgrading themselves to meet global standards. The integration of technology, such as facial recognition, is rapidly advancing. Airports, like Delhi Indira Gandhi International Airport, now utilize facial recognition for processes like boarding passes, moving towards a passport-free future. China has already embraced facial recognition in hotels, simplifying check-in processes, a trend not as prevalent in India. The global industry is evolving, and India must catch up by investing in technology and education to stay competitive.

Could you share your thoughts on the concept of a "Professor of Practice" in the context of hospitality education? What benefits does it bring to students?

The concept of a "Professor of Practice" in the context of hospitality education is a commendable thought. It hasn't been implemented everywhere, but I hope it becomes

a practical reality. The limitation of only 10 percent poses a challenge. For instance, if a department has six permanent lecture hours, having a professor of practice is not feasible unless there are at least 10 such hours. While this practicality hasn't materialized, I'd like to share my own experience. With 25 years of overall experience, including a decade in the industry and teaching since 2008, I can confidently say I've had the best of both worlds. However, not everyone has had a similar trajectory.

If the hiring of a professor of practice is currently constrained by the 10 percent limit, alternative measures can be taken. Hiring visiting and guest faculty, organizing industrial visits, and inviting professionals from the industry for guest lectures can help bridge the gap. Seeking faculty members with relevant industry experience is also crucial. A professor of practice is undoubtedly valuable. For instance, teaching the operations of a hotel cannot be effectively done solely through books. To impart this knowledge, one must have practical experience in a hotel.

Similarly, understanding the workings of a travel agency or tour operator, including the process of booking tickets and observing passenger behavior, requires first-hand experience. Integrating individuals with industry exposure into the teaching faculty is essential to bringing real-world scenarios into the classroom. Without this, it's challenging to convey the intricacies of the field accurately.

As the concept of "workcations" gains traction, how should hospitality management education evolve to prepare professionals for this hybrid work-leisure environment?

Hospitality management education must adapt to the evolving hybrid work-leisure environment. Good hotels in India, especially

branded ones, prioritize fostering excellent work cultures. These establishments enforce a maximum 9-hour workday, even during training, distinguishing them as better places to work. Toxic work cultures are diminishing, and globally, there's a shift towards recognizing the importance of reasonable working hours.

The perception that Indians working abroad experience a better work culture highlights the need for a systemic change in India. It's crucial to extend ethical work practices beyond top-tier companies. The prevailing 6-day work week in some Indian companies contradicts the improved work culture experienced abroad. Driven by legislation, there's a call for broader adoption of ethical practices to ensure a balanced and productive workforce in the hospitality industry. Fatigue negatively impacts performance, emphasizing the importance of conducive work conditions for overall well-being and sustained success in the industry.

Q What's your organization's approach towards inspiring students to start their own startups, considering the new wave of startups in the field?

Our university, with its distinctive focus on fostering entrepreneurship, has established the Entrepreneurship Cell to support students in pursuing startup initiatives. This cell operates



independently within the university and offers certification and diploma programs, providing students access to funding opportunities. In our department, we actively encourage students to engage with the university's Entrepreneurship Cell, and within our curriculum, we emphasize cultivating an entrepreneurial mindset.

We believe in equipping students not only to seek employment but also to become employers themselves. This philosophy is embedded in our curriculum, where we impart coaching and guidance to nurture an entrepreneurial spirit. In 2022, amidst the lingering impact of COVID-19, we organized a successful international conference on entrepreneurship and tourism. This platform facilitated meaningful discussions involving government representatives, scholars, students, and entrepreneurs. It emphasized the importance of individuals becoming job providers rather than solely job seekers.

Our educational approach extends to practical aspects, educating students on preparing proposals for funding from various investors and navigating the regulatory landscape for startups. Additionally, we encourage faculty members to participate in relevant programs, fostering a culture of entrepreneurial education within our academic community. This multifaceted approach aims to empower students to

think innovatively, venture into entrepreneurship, and contribute to the job market as creators of employment opportunities.

Q The National Education Policy 2020 is a comprehensive policy that covers many aspects of education. I'm curious to know your perspective on this policy. What do you think are the strengths of the policy? Additionally, is there anything that you think can be improved upon? If so, what changes would you suggest to make the policy better?

The National Education Policy 2020 marks a significant transformation in our educational landscape, and we are actively engaged in implementing its principles. Our prepared syllabus is poised for launch, bridging the academic transition between two years. The forthcoming academic year anticipates the introduction of the new education policy into our curriculum.

Your inquiry revolves around the potential impact of this policy. Notably, it introduces flexibility for students to pursue diverse interests. A student in hospitality might concurrently explore tourism or delve into artificial intelligence (AI), earning credits from relevant departments. This freedom is facilitated through a structure encompassing discipline-specific major courses, discipline-specific minors, and multidisciplinary courses. Additionally, ability enhancement courses, covering foreign languages or AI, and skill enhancement courses, such as food engineering for culinary programs, contribute to a comprehensive learning experience. Value-added courses and experiential learning further enrich the curriculum.

The policy sets percentage benchmarks for each category, emphasizing a balance of discipline-specific content while encouraging exposure to diverse fields. Specifically, 40% for discipline-specific courses, 20% for discipline-specific minors, 5.5% for multidisciplinary courses, 5% for ability enhancement, and 6% for skill enhancement.


This strategic integration aims to provide a well-rounded and credit-driven education, aligning with the vision outlined in the National Education Policy 2020.

Q What advice do you have for students aspiring to excel in the travel and hospitality industry in India, especially in a post-pandemic world?

For students aspiring to excel in the travel and hospitality industry in India, especially in a post-pandemic world, my advice is crucial. In my department, we focus on cultivating a worldly-wise perspective, refining communication skills, and fostering personality development. This comprehensive approach transforms individuals into thorough professionals sought not only in hospitality and tourism but also in industries such as retail, banking, and cruise lines.

Network with the right kind of people because trust me, it's networking with your peers and your seniors that gets you the new job opportunities. So the better you network and you should not come with blinkers that just come to the department to the college but mingle with other students as well.

Upon joining, students should harbor a passion for excellence in their field, aiming to perform exceptionally in the industry. Networking plays a pivotal role; connecting with peers and seniors opens doors to new job opportunities. It's essential to break away from silos and interact with students from diverse fields, including mechanical engineering, electrical engineering, MBA programs, and mass communication. Embracing this broader outlook is integral to university life.

Enjoying university life while staying passionate about professional goals is crucial. Finally, presenting oneself professionally through well-groomed attire enhances the charismatic persona that attracts companies seeking talented individuals. These guidelines empower students to navigate the evolving landscape of the travel and hospitality industry successfully. 



TECHNICAL COMPETENCIES CRUCIAL FACTOR IN AGRICULTURE BIOTECHNOLOGY

"In a professional field, especially in agriculture biotechnology technical competencies are a crucial factor," says **Prof Rajinder Singh Chauhan**, Professor and Dean at Mahindra University in an interview with Education Post's **Prabhav Anand**. Discussing the dynamic field of Agriculture Biotechnology, Prof Chauhan shares valuable perspectives on the field's evolution and the essential skills for aspiring professionals. Emphasizing technical competencies, he mentions the importance of attributes like critical thinking and effective communication in today's competitive landscape.



With over 30 years of post-PhD academic experience in spearheading educational and research programs in Biotechnology and Bioinformatics, please share some of the most significant changes you've observed in these fields over the years? How have these changes influenced the direction of your research and teaching methodologies?

Well, over the past 30 years in academics, particularly in Biotechnology and Bioinformatics, many significant transformations have been unfolded, notably in the last 10 to 15 years. The advent of CRISPR technology stands out—a game-changer for gene editing across organisms. Analogous to word processing, this technology enables precise genetic alterations, opening diverse avenues in biotechnology sectors like healthcare and agriculture. Another pivotal milestone was the swift development of mRNA-based vaccines, exemplified by Moderna and Pfizer during the COVID-19 pandemic. Within a year, these vaccines emerged as a breakthrough, earning both

technologies the pinnacle recognition in Science and Technology—the Nobel Prize.

In the world of biometrics, its inception in the mid-nineties was spurred by the burgeoning genome sequencing efforts—from bacteria to humans, plants, and animals. As genetic data proliferated, the need to efficiently store and extract valuable information arose. With DNA comprised of only four letters (ADGC) and human genomes boasting 3.2 billion nucleotides, computational tools were crafted, giving birth to the biometrics discipline. These advancements in biotechnology and biometrics have indelibly impacted research and education across life sciences.

Earlier, vaccine development spanned a decade or more, but the swift sequencing of the SARS-CoV-2 genome within days of the pandemic allowed rapid global response. This expeditious process facilitated the prompt creation of diagnostics, vaccines, and therapeutic drugs. The transformative effect extends to education, where these technologies have catalysed advancements in diverse sectors. The conventional timeline for bringing a vaccine to market has been dramatically compressed, exemplifying the global impact of these innovations on both education and research.

How do you perceive the role of technology, particularly Biotechnology and Bioinformatics, in transforming the agriculture sector in India? In your opinion, what are the most promising advancements in these fields that have the potential to revolutionize agricultural practices and ensure food security for the growing population?

Agriculture holds immense importance for a country like India, where 60 percent of the population relies on it. Centuries back, we started with plant diversification and selecting genetically superior ones. In the 1960s, during

a food crisis, Dr. MS Swaminathan introduced dwarf wheat varieties, addressing the issue. Now, biotechnology, specifically genetically modified organisms (GMOs), plays a crucial role.

GMOs, created through genetic engineering, have transformed Indian agriculture. Government approval is limited to GM cotton, providing resistance to pests, especially the bollworm. This not only saves money for farmers but also promotes a healthier environment by reducing pesticide use. Worldwide, developments like herbicide-tolerant transgenics and golden rice, enriched with vitamin A, showcase the potential of GMOs.

Biometrics, particularly genome sequencing of food crops like rice, has been impactful. In the late 1990s, India participated in sequencing the rice genome. Biometrics aids in identifying genes responsible for traits and nutritional value in crops like rice. Molecular markers extracted from genomes assist in marker-assisted selection and breeding, widely employed by agricultural institutes. This approach is not limited to crops but extends to animals, with institutions like the National Bureau of Animal Genetic Resources using it for improving animal breeds.

Both biotechnology and biometrics have made significant strides. However, further impact awaits as the government approves more GMOs and additional food crops. These technologies, with their practical applications, are poised to shape the future of agriculture in India, addressing challenges and ensuring sustainable practices for the growing population.

The agriculture sector in India is currently facing various challenges, ranging from climate change impacts to sustainable agricultural practices. How do you think these challenges can be effectively addressed through education and research initiatives?

In today's scenario, climate stands out as the crucial limiting factor for crop productivity in India, impacting families whose livelihood

depends on agriculture. Climate change, through factors like rising temperatures, floods, excessive rainfall, and glacier melting, affects growing seasons. I'm from Himachal Pradesh, and we witness shifts in where crops like apples can be grown due to these changes.

Climate shifts also introduce new diseases, pathogens, and pests, affecting crop productivity. Unlike humans who can adapt, crops need to endure changing conditions. Breeding technology is key to developing crop varieties resilient to high temperatures and crucially, drought—the latter being significant for India's rain-fed agriculture. The Indian Council of Agriculture Research focuses on breeding drought-tolerant crops. Biotechnology, whether through genetic engineering or molecular markers, plays a role. Molecular markers are extensively used for traits like drought and high-temperature tolerance, as well as resistance to new diseases.

However, this remains a substantial challenge. Until we address factors contributing to global warming, especially carbon dioxide emissions from burning fossil fuels, the challenge persists. Biotechnology is crucial in developing crop varieties resilient to climate effects, but if the situation worsens, drastic decisions may become necessary. The role of biotechnology in addressing climate-related challenges is clear, but it's contingent on managing the root causes of global warming. This is a significant challenge that demands attention and action in the years to come.

Could you share your insights on the importance of collaboration between academia and industry, especially in the field of Agriculture Biotechnology? How can collaborative efforts between educational institutions and agricultural corporations lead to innovative solutions and sustainable practices that benefit both sectors and society at large?

Agriculture education in India, from the Indian Council of Agricultural Research and state

agricultural universities, is well-established. Numerous universities across states and private institutions offer robust programs. Collaboration with industry traces back to the US land grant system, forming a strong foundation. Many professors, including myself, completed degrees in this system, often collaborating with foreign universities.

Historically, senior professors engaged in inter-academic programs, earning PhDs in the US. Industry plays a pivotal role. Hybrid crops, especially vegetables, often emerge from collaborations between agricultural universities and multinationals. After my PhD, I received a fellowship from the Department of Biotechnology to conduct advanced research in genomics and rice in the US.

Government efforts, past and present, aim to integrate agriculture education with foreign institutions and industry. Initiatives like my collaboration with Absolute, a Delhi-based startup focusing on agriculture, exemplify the current government's commitment. This signifies a positive shift, with Indian industries actively participating in collaborative ventures.

The landscape has evolved, with an increasing number of private universities joining the agricultural education sphere. This collaborative approach, integrating academia with foreign institutions and industry, strengthens the agricultural education system in India. The government's initiatives and partnerships with startups like Absolute demonstrate a progressive direction, aligning education with practical industry needs. This synergy between academia and industry is vital for fostering innovation and sustainable practices, ultimately benefiting both sectors and society at large.

How do you envision the future of Agriculture Biotechnology in India? Are there any transformative developments or breakthroughs that you anticipate in the coming years? What steps, in your view, are necessary to realize this vision and ensure that

India remains at the forefront of agricultural innovation globally?

Agriculture biotechnology is already impacting India with BT cotton in farmer fields. CRISPR technology, a gene-editing breakthrough, will play a major role. Unlike traditional GMOs, CRISPR doesn't involve taking genes from other sources. For instance, modifying rice for resistance or climate tolerance doesn't require foreign genes. Using biometrics and computational tools, we identify target genes for enhancement. This eliminates concerns about GMOs affecting health or the environment.

CRISPR's global impact is evident with frequent research outcomes. It addresses the limitations of traditional genetic engineering and assures safer, more precise modifications. The genomics era is another transformative aspect. Understanding why Basmati Rice is exceptional through genomics allows us to identify controlling genes. Developing markers for genetic improvement replaces traditional breeding methods.

The future of agriculture biotechnology in India looks promising. CRISPR's precision and safety in gene editing address previous concerns, making it a significant advancement. In the next 5 to 10 years, we anticipate visible impacts on agriculture, with increased crop quality and traits like aroma, resistance, and climate tolerance. The genomics era further contributes to understanding and enhancing crops without relying solely on traditional breeding methods. These developments position India at the forefront of agricultural innovation, ensuring a bright future in the field of agriculture biotechnology.

Recently, UGC came up with new guidelines for mandating internships for research students. How do you see that?

Yes, definitely I know very well about this internship program, what UGC has recently come up with as internships for research students, as mandated by the recent UGC guidelines, are crucial. In the biotech and biometric education profession, internships have been integral for about two decades. Initially, a mandatory six- to eight-week internship

was part of the four-year degree program. However, exceptional students and faculty often encouraged yearly internships.

Internship sectors varied based on the field, like medical biotechnology in hospitals or biotech industries, biomedical in pharma, or agriculture in commercial farms or food processing industries. Practical exposure is vital, bridging the gap between theoretical learning and real-world application. It's not just about being a smart student; practical exposure is essential for understanding the gravity of problems and valuing potential solutions and technologies.

Practical learning's importance has grown over time. While theoretical knowledge is manageable, grasping practical applications requires hands-on experience. For instance, discussing a crop problem's solution is one thing, but experiencing it during an internship helps students truly comprehend the challenges and appreciate the needed solutions and technologies.

Institutions must sincerely implement internships to benefit students in their careers. Practical learning enhances understanding, making students more adept in problem solving. It's not just an academic requirement; it's a crucial step toward fulfilling students' ambitions and ensuring their future success. The sincerity of implementation determines the effectiveness of internships, impacting students' careers and fulfilling the aspirations of both students and parents.

For students who are interested in pursuing a career in Agriculture Biotechnology, could you offer some valuable advice? What skills, knowledge, and mind-set do you believe are essential for aspiring professionals in this field, and how can they prepare themselves for the challenges and opportunities that lie ahead?


In any professional field, especially in

Agriculture Biotechnology technical competencies are a crucial factor. For a bachelor's, understanding biology, botany, and animal physiology is vital. Intensive lab exposure during programs further enhances technical knowledge. Unlike some other fields, agriculture biotech demands a strong infrastructure and well-trained faculty.

The Department of Biotechnology, Ministry of Science and Tech, plays a very important role. Master's programs funded by the government have been initiated in state agriculture universities, selected through a national entrance exam. This ensures quality education with well-established institutions, qualified faculty, and a robust academic ecosystem.

In my experience, Agriculture Biotechnology education began over 30 years ago and has grown significantly. However, besides technical competencies, certain attributes are now crucial for professionals. Problem-solving skills, critical and analytical thinking, teamwork, work ethic, and effective communication are sought by employers worldwide. Even with high academic achievement, lacking these attributes can be a disadvantage.

To address this, we've implemented research-enabled project-based learning over the past 20 years. This approach exposes students to real agricultural problems and requires them to work on projects to find solutions. This method instils critical thinking, teamwork, and effective communication skills. For instance, in agriculture biotech, students engage with farmers to understand and solve real-world issues.

This approach has proven effective, producing professionals capable of facing today's and tomorrow's challenges. It's a comprehensive strategy, ensuring students not only possess technical competencies but also essential attributes for success in their careers. As education evolves, this holistic approach becomes increasingly important, preparing students to meet the demands of the ever-changing professional landscape. 

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SUSTAINABILITY IN AGRICULTURE IS A DOUBLE-EDGED SWORD

Ankit Alok Bagaria,

Co-founder of Loopworm, an Agri-Tech startup, tells Education Post's **Prabhav Anand** that the relationship between technology and agriculture in India reveals a variety of experiences, challenges, and strategic insights. "The moment money starts flowing into sustainability, people will get involved."



What inspired you to enter Agri-Tech and how have your past experiences shaped your approach to tackling agriculture challenges through Loopworm?

My inspiration to enter Agri-Tech was primarily due to food security. I observed that India, being an agrarian country, produces a lot of agricultural commodities but doesn't process them much. We have abundant raw materials, land, labor, and electricity, which are the four cost components for any manufacturing process. This motivated me to start something on the manufacturing side where we can process a bio-resource into different bio-molecules and extract value from it for different industries as alternative ingredients.

I'm not much into software solutions. I believe in building something tangible, producing more ingredients, and serving society. That was my calling for Agri-Tech. At Loopworm, we solve two problems. First is the organic waste management issue. India has almost 52 percent of food waste, and the insects that we farm consume these wastes. We process farmed insects because we don't want to disrupt nature or disturb the life cycle. These insects are rich in proteins, fats, and bio-molecules. We extract high-quality proteins, fats, and different types of biomolecules from them and use them in different industries. We primarily target the animal feed industry because there's a major

problem when it comes to arable land availability, portable water, and wild marine life. We might as well use nature's limited availability for humans and feed our animals something else. That's where the insects come into the picture. All this depends upon sustainability.

From your perspective, what are the most significant trends currently shaping the Agri-Tech industry globally, and how might they influence agriculture practices in India?

So, globally, the trends in Agri-Tech vary based on the country's development status. Developed economies are striving for productivity, yield, and labor reduction. They're adopting practices like precision agriculture to get more from less. They're also trying to reduce import dependencies by adopting technologies like hydroponics, indoor farming, and soil-less cultivation. In contrast, developing countries like India are trying to improve yield and productivity but face challenges due to cost sensitivity and lack of education among those involved in agricultural activities. The focus here is on developing low-cost solutions and machinery to assist farmers. Regulations are not stringent, allowing farmers to use a variety of chemical and non-chemical products.

However, the market for organic food is limited due to its higher cost. Underdeveloped countries are still figuring out farming methods and trying to utilize their natural resources effectively. These trends significantly influence agricultural practices in India, balancing between improving productivity and managing costs. In Africa, for example, there's a vast wealth of underutilized natural resources. The lack of technologies, particularly survey technologies, is a significant issue. Technology comes with a cost, and affordability often dictates accessibility. For instance, German machinery might be expensive for us, but not for Germans due to local production and supply. Similarly, machinery supplied by India works for us, but certain African countries might find Indian machinery expensive and inaccessible. Therefore, the question of adopting technology often boils down to accessibility due to affordability.



How do you perceive the role of government initiatives in supporting and promoting Agri-Tech advancements in India? Are there specific policies you believe could further catalyze growth in this sector?

The government plays a crucial role in supporting and promoting Agri-Tech advancements in India. As our economy grows, the government's role becomes even more important. Various ministries are coming together to promote value addition in Agri-Tech. The transport ministry is crucial for improving cold storage and transportation to avoid wastage during transit. One major issue the government is trying to solve is the preservation of farm produce. A lot of farm produce gets wasted at the farm gate before it reaches the consumer. The government is working to preserve what we produce, add value to it, and increase productivity and yield. Regarding policies, India has been

slow in adopting or building new technologies. For example, there has been resistance against genetics, which has affected our productivity and yield. There are no set policies for insect farming for other species, although we have received a small grant from the Ministry of Agriculture and Farmers' Welfare.

Until there are regulations, it remains a gray zone, and funding doesn't come in. Unconventional farming techniques like seaweed farming, algae farming, and pearl farming can help the Indian population, especially marginalized farmers with limited land holdings. These unconventional farming methods can make the best use of their limited land. India needs to lead in certain areas due to our abundant natural resources. We have the potential to become global suppliers for many products. However, due to policy delays, funding and technology implementation are lagging. The issue is not a lack of governance, but rather a lack of understanding. People who understand genetics should discuss its pros and cons, rather than those without scientific knowledge. Similarly, those who understand high-tech precision agriculture and farming techniques need to be involved in

the system. People with generic information, especially about agricultural statistics, may not understand technology. Without understanding, it's challenging to support or regulate technology. It often takes us almost a decade to start something in India after it has been developed worldwide. This is an area the government can look into. However, it's important to note that they are already working on it.

Sustainability is a key focus in modern agriculture. How can Agri-Tech contribute to sustainable farming practices, and what challenges do we need to overcome to achieve widespread adoption of eco-friendly technologies?

Basically, sustainability in agriculture is a double-edged sword. Sustainable practices can lead to increased costs or decreased productivity. While it improves the quality of the produce, the question is whether consumers are willing to pay more for it. Sustainability needs to be consumer-driven. If consumers value sustainable products, then sustainability can become mainstream. However, it's a chicken-and-egg problem. Consumers want the price of sustainable products to go down before they buy, and producers want the price to go up before they produce. This dilemma needs to be resolved for the widespread adoption of sustainable practices. Drawing a parallel with the IIT system, where 90 percent of IITians go into software jobs for better pay and lifestyle, the same principle applies to sustainability. The moment money starts flowing into sustainability, people will get involved. Therefore, financial incentives play a crucial role in promoting sustainable farming practices.



How can we enhance education and awareness among farmers about the benefits and applications of Agri-Tech?

Enhancing education and awareness among farmers about Agri-Tech requires a multi-pronged approach. Every village has an early adopter farmer who is often a risk-taker, educated, or both. Other farmers look up to them, so they can play a crucial role in spreading awareness. Understanding the farmer's mindset is essential. For a farmer, the focus is on yield, productivity, and reducing losses rather than the quality of the produce. This mindset needs to be addressed first. If a farmer is doing contract farming, the company controls the quality, and the farmer's say is limited. There are many people studying agriculture engineering, veterinary sciences, and BSC, MSC agriculture. We have dedicated IARI, and ICAR colleges for different types of agricultural produce. However, the opportunities are limited. People developing solutions need to understand the

farmer's mindset. For the farmer, cost matters more than the productivity of the feed. It's about the productivity that you get per unit cost. The mentality in most pockets is to get enhanced productivity at the same cost. This becomes a chicken-egg problem. Someone needs to take a hit first, prove it to them, and not just with lab scale results or research papers.



Agriculture is often deeply rooted in traditional practices. How can the industry and farmers adapt to the rapid technological changes brought about by Agri-Tech without compromising the essence of traditional farming wisdom?

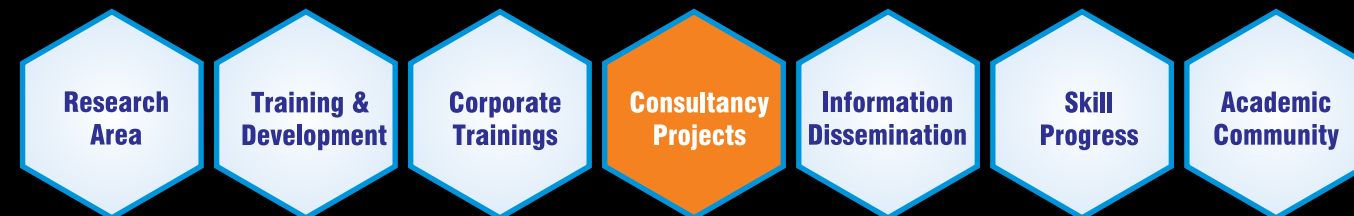
I'd say get a farmer's son to do it. Because agriculture is indeed deeply rooted in traditional practices. Adapting to the rapid technological changes brought about by Agri-Tech without compromising the essence of traditional farming wisdom requires a bridge between traditional farming and scientific agriculture. This bridge could be a farmer's son or daughter who has become a scientist. Farmers trust their community, and people who have studied and come from farming backgrounds have a unique mindset. They are willing to compromise on profitability sometimes and are cautious about launching a product unless they're 120 percent sure. This contrasts with most commercial practices where 80 percent assurance works. A person from a farming background will never risk a farmer. This is where trust gets established, and practices change. Therefore, we need farmer's sons and daughters to drive this change.

What advice do you have for Agri-Tech entrepreneurs? What lessons have you learned from Loopworm's journey that would be valuable for others in Agri-Tech startups?

For Agri-Tech entrepreneurs, my advice is to first do primary research. Understand all your stakeholders, including farmers, suppliers, distributors, logistic providers, and sellers. Go to the field, and understand the problem statement firsthand. This will help you develop better business decisions and operational models. And second is that, don't rush for money early. Give ample time for proof of concept and minimum viable product development in AgriTech. You cannot target a software industry growth or funding cycle in an AgriTech or life sciences space. One of our crucial learnings from Loopworm was not to rush towards equity investments early on. Our first equity investment came in three years after we started our startup. Until then, we were operating with the help of government grants. Slowly and steadily develop your proof of concept, master your pilot facility, stabilize everything, get that confidence, and then get the money to scale it. Don't rush into things.

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BUSINESS PERSPECTIVE ASIDE, MENTORSHIP EXTENDS TO PERSONAL GROWTH

In an interview with Vinaychandra M. Mahendrakar, Chairman of IBMR Hubli, Education Post's Prabhav Anand gained valuable insights into the innovative educational approach adopted by the IBMR Business School, as he stressed on the importance of industry connectivity in preparing students for the challenges of the 21st-century job market emphasizing the need for practical skills beyond university curriculums.



What inspired you to pursue a career in education and become a leader in business education?

When we were pursuing education, back when I started studying engineering myself, we noticed that there were very few institutions in north Karnataka. Most institutions were concentrated in Tier 1 cities like Bangalore, Delhi, and Kolkata. So, we thought of expanding education to Tier 2 cities like Hubli, which is the fastest-growing city in Karnataka and our second-largest city in terms

of population and business. We wanted to make quality education accessible to students who couldn't afford high fees. The idea was to provide affordable management education to students in north Karnataka who would otherwise travel to cities like Pune and Bangalore for MBA and higher education.

That's how the concept started taking shape. I left my job and embarked on this passionate journey. In 1999, we took the first steps, and by 2004, we had established branches in Bangalore and Chennai. We extended this model to Ahmedabad in 2006 and Gurgaon in 2008. Currently, we have four branches in India—two in Bangalore, and fourteen institutions across the country, including one in Ahmedabad and one in Delhi.

With the increasing globalization, how can business schools encourage international perspectives and cultural diversity among their students, preparing them for a globalized workforce?

Back in 2006, IBMR embarked on a unique journey. We recognized the onset of globalization and aimed to provide our students with international exposure. This idea became a reality, and in 2006, we started sending our students abroad to countries like Dubai, Malaysia, and Singapore. We sought out smaller universities that could offer valuable experiences for our students. We established collaborations with several foreign universities, allowing our students to immerse themselves in different business and economic cultures.

Alongside country exposure, we arranged special lectures by professionals and professors from these foreign universities. This initiative allowed our students to gain insights into diverse walks of life and understand global business cultures. Since then, every year, we organized a boot camp abroad. During this program, our students spend three days in universities, three days in industries, and three days participating in various programs. It's a comprehensive approach, offering a glimpse into the global landscape.

We consistently provide support by inviting experts from different business backgrounds to our institution, both virtually and physically. They

share valuable global perspectives, enriching our students' understanding of the competitive world. This multifaceted approach ensures our students comprehend the global challenges they'll face in their careers. Addressing the essential aspect you mentioned, this approach equips them with the necessary skills for the competitive environment they'll encounter.

Mentorship and guidance often play a significant role in a student's academic and professional journey. How does mentorship factor into the educational approach at IBMR Business School, and what advice do you give students seeking mentorship in their careers?

See, mentorship isn't just about the business perspective; it extends to personal growth, shaping their careers, and achieving personal goals. This realization dawned on us a while back because of my business background and extensive interactions with industry experts. We noticed that mentorship played a crucial role. In 2008, we initiated small mentorship camps, inviting experts from various parts of India since online platforms weren't prevalent then. These experts came to our campus and provided mentorship, guiding students not only in business but also in honing their skills to be industry-ready.

This approach has been ingrained in IBMR for years, and we're pleased with the results. Over time, we've expanded our mentorship programs to include psychological mentorship and diverse forms of entrepreneurship guidance. We offer a range of mentorship options, allowing students to choose based on their interests. It's not a one-size-fits-all approach. We assess their preferences through surveys and campaigns, tailoring the mentorship experiences accordingly.

Our efforts have yielded positive results. The students are genuinely enlightened through these mentorship initiatives. It's not just something we say; it's something we see in their progress, and that's truly satisfying.



In your opinion, how can educational institutions best prepare students to meet the challenges of the 21st-century job market, especially considering the rapid advancements in technology and automation?

The thing is, connecting to the industry is very important. Without that dot, if they can't connect to any educational institution, they can't transfer their students. Without industry connect, we can't understand the industry's needs. Due respect to the university curriculum, students can't get placed with just that. They can't match the industry skills. So industry skills are vital. These skills can only be learned from industrial experts. We keep inviting them for board meetings, board of studies, everything. Every board of studies has one or two members from the industry experts. We keep calling them. With these dots, we can connect a lot of things.

We also understand the challenges for the next century, next decade, or the next two years. For example, now AI is running on waves. If students don't understand data analytics

and AI, they are nowhere. These are basic skills nowadays. So, these skills can only be understood from industry people. We keep inviting them, debating along with them. We encourage our faculty members to attend small trade fairs, chambers of commerce, and such events. We encourage them to participate as well. So, they understand new challenges and prepare students for the next level. IBMR started this about 4 and a half years back. We started with Education 4.0 before announcing 4.4. We were ahead of time. Faculty members and the entire team understood it and implemented it. In 2008, we started the PGPM program, which focuses on next-level scaling. We have been teaching that for a long time. We keep innovating something new apart from regular academics so that our students can flourish and tackle industry challenges.

That's our focus at IBMR Business School from my side. We emphasize core skills, literacy, soft skills, and lifelong learning. We pick up global perspectives with different experts, mentorships, diversity, and networking with products. These topics are what we elaborate, debate, and experiment with, involving students and faculty members, all education stakeholders. Moving to the next level. That's how it is. **EF**



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Educationalist **Dr. Maithili Tambe**, CEO of The Academy School (TAS) in Pune, discusses the challenges and opportunities in the education sector with Education Post's **Prabhav Anand**. She further talks about the importance of mental health support, navigating the digital world, and balancing technology with traditional values. "A balance of both technology and traditional teaching is necessary. Sensitizing and promoting responsible use of technology is important."

BALANCE OF GOOD SLEEP AND HOBBIES IMPORTANT FOR PRODUCING HAPPY HORMONES IN STUDENTS

In today's society, students often face significant pressure from various sources, including parents, peers, and societal expectations. How do you perceive the impact of these pressures on students' overall well-being, and what are some common challenges students encounter in dealing with these expectations?



So today, students face a lot of pressure from different parents, peers, and society. This pressure, which is not a new phenomenon, has increased due to greater exposure. It's crucial to understand that this pressure can lead to stress and anxiety in students, often causing them to withdraw and stop communicating. As parents and educators, we need to balance our expectations with an understanding of what the child is going through. Open communication is key. Students should feel heard and be able to discuss their concerns and challenges without fear of judgment. In my experience as an educator, I believe that addressing these challenges should start with training parents and teachers. We need to ask ourselves: Are we open to communication? Are we approachable? When students see that we are open to communicating freely and without judgment, they will start talking to us. This approach has been beneficial in my school. Remember, the change starts with us. As adults, we need to model the behavior we want to see in our students.

The expectations of parents and the society at large on students by parents and society can be overwhelming and often shape their choices and actions. Could you share your insights on why these expectations exist and the ways in which they influence students' lives, both academically and personally?

Parents' expectations are often deeply rooted in societal norms and cultural traditions. For instance, in India, there's a common trend where if one child in a family becomes an engineer or a doctor, there's an unspoken expectation that the other children will follow the same path. This is akin to the saying "When

one sheep goes in one direction, the flock of sheep follows it." This kind of culture is prevalent in India, and it's not uncommon to see families where multiple generations have pursued the same professions. However, it's important to note that there's been a significant shift in this mindset over the years. As I interact with parents, I've noticed a progressive change in their thinking.

Parents are becoming more open to understanding their children's interests and are willing to support them in pursuing diverse career paths. They are beginning to realize that the world of careers is not limited to traditional professions like being a doctor or an engineer. There are countless career options available in today's society, each with its own set of required skills. As educators and schools, we have a crucial role to play in this changing landscape. We need to ensure that we are equipping our students with the skills they need for the careers they aspire to. This includes not only academic skills but also soft skills like communication, critical thinking, and problem-solving. By doing so, we can help our students navigate the pressures of societal expectations and carve out their unique paths.

The IIT JEE exam is often over-romanticized in India and carries immense societal expectations. Students, sometimes, take extreme measures if they are unable to clear this exam. Why do you think the IIT JEE exam is given such significance and reverence in Indian society?

I feel that these exams are good. I'm not going to say that it's bad. It is good. But only for those children who have an interest in those fields. It's like a culture that has developed in India slowly making IIT JEE a huge deal because, there's a thought process in society that if you clear these examinations, you will get into top colleges. If you get into top colleges, you'll have a better career or a good job and then you'll have a settled life. So that kind of thinking we have in India, but I feel that we should always look at what the child's interest is. That is more important for us. And, again, at my school, we are exposing the children to as much as many careers are there in this world. So we have experts in that field coming and speaking with the children so that they also understand their position.

In many educational systems, students often find themselves uncertain about their career choices, leading to potential wrong decisions. When students make a misstep or face failure due to these uncertainties, what support systems and guidance should be in place to help them navigate these challenges effectively? How can educators and parents contribute to helping students rebound from setbacks and make informed decisions about their future paths?

What we do at TAS (The Academy School) is that we've been planning a program for our children, where we give career counseling at school as well. Wherein, our career counseling starts with exposure to different careers, whereas we are also coming up with a program where career counseling is going to start right, from fifth grade onwards. Why fifth grade? The reason for starting in fifth grade is to involve parents in the process. Choosing a career path requires everyone's agreement. If parents are not convinced, they might be disappointed with the child's choice. So, at schools, I feel that we should have a very good career counseling program, which will help the children to decide on what they really want to do or what are they good at.



Seeking help for mental health concerns feels daunting. How can one overcome the stigma associated with mental health issues and approach counseling or therapy services on campus? What resources are available, and how can they reach out for support without feeling judged or embarrassed?

As mentioned earlier, we completely ensure open communication with our students. If a student is hesitant to speak with a parent or teacher, we have a psychologist available 24/7. This psychologist observes classes and students, and if a teacher raises concerns about a student, the psychologist observes the student, calls them in, and discusses the problem.

The psychologist is professionally trained to communicate with children. We believe that a teacher can be an effective counselor, so we are training our teachers to counsel students. To maintain confidentiality, we've placed boxes on every floor that are only accessible to the counselor and the principal. They open these boxes weekly or monthly to check for any notes from students and then take appropriate action.

How can students manage their academic pressure and maintain a healthy work-life balance without feeling overwhelmed? What strategies can they use to cope with the stress of exams, assignments, and other academic responsibilities while also taking care of their mental well-being?

There should be a balance in their academics and also in the hobbies that they like to do. They should have a nice balance. For that, they should be having a nice schedule. They should have good time management. And as a school, we also need to teach them what time management is. How can they practice time management? How can they work on their schedules? They need to understand to complete those tasks on their schedules and for that discipline has to come in. Discipline is the most important thing in a student's life. They also have to rest because when you rest, you reproduce your brain cells. And it helps you improve. You need good sleep and hobbies to produce happy hormones that help with work.

In the era of social media, students are exposed to various influences. How can schools help students navigate the digital world responsibly and promote positive online behavior? What digital literacy initiatives can be implemented to address this challenge in educational institutions?

Schools can conduct sessions on cybersecurity, a practice we follow at our school. The repetition of these sessions is crucial to make cybersecurity a habit in a student's life. Students need to be made aware of right and wrong on social media, as people can easily get influenced.

Schools and parents must work together to prevent students from getting carried away with social crises.

The recent mobile phone ban in Delhi schools is a good approach, but sensitizing children is more important than imposing rules. Children are at an age where they are prone to mischief, but making them understand what is good and bad is more crucial. Rules are good, but making students more responsible towards social media is important.

India is witnessing rapid technological advancement. How can schools prepare students to embrace technology while preserving essential human values and social skills? What is your approach to balancing technology and traditional values in the education system?

Technology can be used in education and daily schooling. There are various ways to use technology in school. However, traditional teaching methodologies are also important. The approach should be to use technology in a beneficial and traditional way. For example, project-based learning can involve technology and research through books. Research can be done online, but opening a book also provides valuable knowledge. Balancing these criteria is essential.

In the digital era, AI and ML have transformed the education sector. What are your thoughts on using these technologies alongside traditional education systems, considering the significant shift in teaching methodologies?

There can be a balance of both. It is not that you should not use technology at all, or not only teach traditionally. There should be a nice balance of both. I would say sensitizing and making them responsibly use of this responsible use of social or technology is also important. Sensitizing children and teachers with it is the most important way we can go ahead with it. 📧

GROWING GREEN

A COOL TAKE ON BOOSTING INDIAN AGRICULTURE WITH AGRI-TECH VIBES

Prabhav Anand

Characterized by its extensive agricultural landscape and a predominantly agrarian economy, India finds itself at the forefront of a transformative era driven by technological advancements. The Agri-Tech sector, an expansive domain encompassing innovations ranging from precision farming to data-driven decision-making, emerges as the linchpin in shaping the future trajectory of Indian agriculture.

As the world's most populous country of more 140 billion, India's agricultural sector plays a pivotal role in providing livelihoods to a significant portion of its population. In recent years, there has been a discernible shift towards leveraging technology to address the evolving needs and challenges of this crucial sector. The infusion of digital solutions, precision agriculture techniques, and data-driven insights has the potential to not only enhance productivity but also

ensure the sustainability of agricultural practices.

To grasp the present landscape, it is imperative to trace the evolutionary journey of Agri-Tech policies in India. Over the years, the government has introduced a series of initiatives aimed at encouraging the adoption of technology in agriculture. The National e-Governance Plan for Agriculture (NeGPA) was launched in 2010, with the goal of providing farmers with timely information through the use of Information and Communication Technologies (ICT). This initiative marked a significant milestone in the integration of technology for fostering

sustainable farming practices. In addition, subsequent policies, such as the Pradhan Mantri Fasal Bima Yojana (PMFBY) and the Soil Health Card Scheme, have further emphasized the importance of using technology to support the agricultural sector.

The contemporary Agri-Tech policy framework, as of the current year, represents a mosaic of central and state-level initiatives. The Ministry of Agriculture and Farmers Welfare, in collaboration with diverse state governments, has spearheaded programs to promote digital agriculture. These initiatives encompass the adoption of precision farming techniques, Agri-input management, and establishing robust market linkages. The National Mission on Sustainable Agriculture (NMSA) emphasizes the pivotal role of technology in achieving the twin objectives of ensuring food security and environmental sustainability.

As India stands at the nexus of tradition and innovation in agriculture, it becomes imperative to unravel the challenges impeding the seamless integration of technology into this sector. Infrastructure disparities, limited awareness and adoption among farmers, data security and privacy concerns, regulatory ambiguities, and the accessibility of finance pose formidable obstacles. Addressing these challenges requires a nuanced understanding of the intricacies involved and the formulation of targeted strategies to overcome them.

By advocating for digital infrastructure development, farmer empowerment programs, a robust data governance framework, an agile regulatory structure, and incentivizing financial support, the aim is to pave the way for a thriving Agri-Tech ecosystem that propels Indian agriculture into a sustainable, technologically advanced future.

Historical Evolution of Agri-Tech Policies in India:

To truly comprehend the current state of Agri-Tech policies in India, a retrospective examination of their historical evolution is imperative. Over the years, the Indian government has strategically introduced a series of initiatives to catalyze the integration of technology into the fabric of agriculture, in

recognizing the transformative potential it holds for the sector.

The journey began with the initiation of the National e-Governance Plan for Agriculture (NeGPA) in 2010, marking a paradigm shift in how technology could be leveraged to empower farmers. NeGPA aimed to provide timely and relevant information to farmers through the use of Information and Communication Technologies (ICT). The rationale was clear – by harnessing the power of digital platforms, farmers could access real-time data, weather forecasts, market prices, and advisory services, thereby empowering them to make informed decisions and optimize their agricultural practices.

As the digital landscape continued to evolve, subsequent policies built upon the foundation laid by NeGPA. The Pradhan Mantri Fasal Bima Yojana (PMFBY) and the Soil Health Card Scheme emerged as integral components of this evolving framework. PMFBY sought to mitigate the risks associated with crop losses by providing farmers with insurance coverage. Simultaneously, the Soil Health Card Scheme emphasized the significance of soil quality in sustainable agriculture, utilizing technology to assess and disseminate information about soil health to farmers.

These initiatives underscored the government's commitment to embracing technology as a catalyst for change in the agricultural sector. The emphasis on information dissemination, risk mitigation, and sustainable practices laid the groundwork for a more comprehensive approach to Agri-Tech policies in India.

The evolution continued with the advent of precision farming techniques and the exploration of data-driven decision-making in agriculture. The realization that technology could not only enhance productivity but also contribute to the overall sustainability of farming practices prompted the government to further refine its approach.

In the contemporary landscape, the Agri-Tech policy framework is characterized by a multifaceted approach, blending central and state-level initiatives. The Ministry of Agriculture and Farmers Welfare, in

collaboration with various state governments, has launched targeted programs to propel digital agriculture. These programs encompass a spectrum of interventions, including the adoption of precision farming techniques that optimize resource utilization, Agri-input management for efficient use of fertilizers and pesticides, and the establishment of robust market linkages for farmers.

The National Mission on Sustainable Agriculture (NMSA) stands as a testament to the evolving priorities within the Agri-Tech policy landscape. By explicitly acknowledging the pivotal role of technology, the NMSA aligns itself with the dual objectives of ensuring food security and environmental sustainability. It signifies a departure from merely integrating technology for efficiency's sake to using it as a strategic tool for achieving broader agricultural goals.

In essence, the historical evolution of Agri-Tech policies in India reflects a journey from basic information dissemination to a more nuanced and comprehensive approach that embraces technology as an integral part of sustainable agricultural practices. The ongoing efforts highlight the government's commitment to navigating the complexities of the agricultural landscape by leveraging the potential of technology, thereby steering Indian agriculture towards a more resilient and tech-savvy future.

Current Agri-Tech Policy Framework:

As of the present year, the Agri-Tech policy framework in India represents a dynamic mosaic of central and state-level initiatives, reflecting a concerted effort to harness the potential of technology for the betterment of agriculture. The Ministry of Agriculture and Farmers Welfare, in collaboration with diverse state governments, has been at the forefront of rolling out targeted programs that encapsulate a spectrum of interventions designed to propel the digital transformation of agriculture.

At the heart of the current Agri-Tech policy framework lies a strategic emphasis on digital agriculture. This encompasses a range of initiatives aimed at leveraging technology

to enhance various facets of agricultural practices. Precision farming techniques take center stage, offering a sophisticated approach to resource management. By optimizing the use of water, fertilizers, and pesticides, precision farming not only enhances productivity but also contributes to the sustainable utilization of resources—an imperative in the face of increasing environmental challenges.

Agri-input management is another key focus area, emphasizing the judicious use of agricultural inputs such as fertilizers and pesticides. Through technological interventions, farmers are empowered to make informed decisions about the quantity and timing of input application, leading to improved yields and reduced environmental impact.

Market linkages form a crucial component of the current Agri-Tech policy framework, recognizing that access to markets is pivotal for farmers' economic well-being. Digital platforms and technologies are harnessed to connect farmers directly with buyers, eliminating intermediaries and ensuring fair remuneration for their produce. This not only enhances the income of farmers but also fosters a more transparent and efficient agricultural supply chain.

The National Mission on Sustainable Agriculture (NMSA) remains a cornerstone of the current policy landscape, echoing a commitment to the dual objectives of food security and environmental sustainability. By incorporating technology into the mission's fabric, the government aims to create a synergistic relationship between agricultural productivity and ecological preservation.

Collaboration between the central and state governments is a defining feature of the current Agri-Tech policy framework. Recognizing the diverse agricultural landscapes and varying needs across states, this collaborative approach ensures that interventions are tailored to local contexts, fostering a more inclusive and effective implementation of Agri-Tech initiatives.

While the current framework signifies substantial progress, challenges persist. Infrastructure disparities, particularly in digital connectivity, pose a hurdle to the widespread adoption of Agri-Tech interventions, especially in remote rural areas. Bridging this gap remains a priority to ensure that the benefits of technology

reach farmers across the country equitably.

In summary, the current Agri-Tech policy framework in India reflects a strategic and multi-faceted approach towards leveraging technology for the advancement of agriculture. From precision farming to market linkages, the emphasis is on integrating digital solutions to enhance productivity, sustainability, and the economic well-being of farmers. As technology continues to evolve, the framework remains dynamic, adapting to emerging challenges and opportunities, steering Indian agriculture towards a more resilient and tech-driven future.⁴

Challenges Faced by the Agri-Tech Sector:

Infrastructure Disparities:

A primary challenge confronting the Agri-Tech sector is the glaring disparity in digital infrastructure across regions. While urban areas benefit from robust connectivity, remote rural areas often lack the necessary digital infrastructure to support Agri-Tech interventions. Addressing this digital divide is essential to ensure equitable access to technological advancements, allowing farmers in all regions to benefit from the transformative power of Agri-Tech.

Farmers' Awareness and Adoption:

Despite concerted efforts by the government, there persists a significant gap in awareness and understanding among farmers regarding the benefits of Agri-Tech. Farmers, particularly in remote areas, may hesitate to adopt new technologies due to a lack of awareness, skepticism, or the absence of proper training. Bridging this gap requires comprehensive awareness campaigns and training programs to empower farmers with the knowledge and skills needed to embrace Agri-Tech solutions.

Data Security and Privacy Concerns:

The integration of data-driven technologies raises valid concerns about data security and privacy. Farmers may be apprehensive about sharing sensitive agricultural data, fearing misuse or

unauthorized access. Striking a delicate balance between leveraging data for informed decision-making and ensuring data privacy is a critical challenge that policymakers must address. Establishing robust frameworks for data governance that prioritize security and privacy is imperative to build trust among farmers.

Regulatory Ambiguities:

The Agri-Tech sector operates in a rapidly evolving technological landscape, and regulatory frameworks must keep pace. Ambiguities in regulations, especially concerning data ownership, interoperability, and standards, create uncertainty for both technology developers and users. Clarity in regulations is vital to instill confidence and foster innovation within the sector.

Access to Finance:

Agri-Tech startups often face challenges in accessing finance for research, development, and scaling operations. Traditional financial institutions may perceive Agri-Tech ventures as risky, hindering their growth potential. Tailored financial instruments and support mechanisms are essential to facilitate the financial sustenance of Agri-Tech startups, ensuring that promising innovations receive the necessary resources for development and implementation.

Recommendations for a Conducive Policy Environment:

Digital Infrastructure Development:

To tackle infrastructure disparities, the government should invest significantly in strengthening digital connectivity in rural areas. This includes expanding broadband access, improving network reliability, and providing support for the development of digital infrastructure at the grassroots level. A robust digital backbone is crucial to democratize access to Agri-Tech solutions and bridge the urban-rural divide.

Farmers' Empowerment Programs:

Launching comprehensive farmers' empowerment programs is essential to enhance awareness and understanding of Agri-Tech solutions. These programs should encompass

training sessions, workshops, and demonstration projects to showcase the practical benefits of adopting technology in agriculture. Empowered farmers become active participants in the Agri-Tech ecosystem, driving its adoption and success.

Data Governance Framework:

Establishing a robust data governance framework is crucial for addressing data security and privacy concerns. The framework should provide clear guidelines on data ownership, consent mechanisms, and penalties for unauthorized access. Collaborative efforts involving government bodies, industry stakeholders, and farmers can contribute to the formulation of effective data governance policies that protect farmer data while fostering innovation.

Agile Regulatory Framework:

The regulatory framework governing the Agri-Tech sector should be agile and adaptable to technological advancements. Regular consultations with industry experts, startups, and farmers can help policymakers stay ahead of emerging trends, ensuring that regulations remain relevant and supportive of innovation. Flexibility in regulations fosters a conducive environment for experimentation and growth within the Agri-Tech sector.

Incentivizing Financial Support:


To boost the financial viability of Agri-Tech startups, the government should consider introducing targeted financial incentives and support mechanisms. This could include tax breaks, grants, and low-interest loans specifically designed for Agri-Tech ventures. Collaborations with private investors and financial institutions can also play a crucial role in ensuring access to finance, encouraging investment in innovative Agri-Tech solutions.

Conclusion:

In navigating the landscape of Agri-Tech policies in India, the journey unfolds as a dynamic narrative of evolution,

challenges, and strategic recommendations. The Agri-Tech sector, positioned at the intersection of tradition and innovation, presents a pivotal juncture for the future of Indian agriculture. As the nation grapples with the imperative to enhance agricultural productivity, ensure food security, and uplift the livelihoods of millions of farmers, the significance of a strategic and supportive policy environment becomes more evident than ever. The challenges faced by the Agri-Tech sector, from infrastructure disparities to data privacy concerns, underscore the complexities inherent in integrating technology into the fabric of agriculture.

However, the recommendations put forth offer a roadmap for overcoming these challenges and cultivating an environment conducive to Agri-Tech growth. From bolstering digital infrastructure to empowering farmers through awareness programs, establishing robust data governance, maintaining an agile regulatory framework, and incentivizing financial support, each recommendation serves as a critical puzzle piece in the larger mosaic of Agri-Tech policy. India stands at a crossroads where strategic decisions today will shape the agricultural landscape of tomorrow. By addressing the challenges head-on and implementing the recommended policies, India can pave the way for a thriving Agri-Tech ecosystem. This ecosystem, grounded in sustainability and technological advancement, has the potential not only to enhance agricultural efficiency but also to uplift farmers, bridge rural-urban divides, and contribute to the global conversation on sustainable agriculture.

In this concluding chapter, the story of Agri-Tech policies in India is not just about technology but about empowering farmers, preserving the environment, and ensuring food security for future generations. It is a story of resilience, innovation, and the collective effort to transform challenges into opportunities. As the narrative unfolds, the hope is that India will emerge as a leader in Agri-Tech, setting an example for the world and steering its agricultural sector towards a sustainable and tech-driven future. 

EVERYONE'S SMART UNIVERSITY HOLDING GROUP SOARS TO FOUR BILLION SAUDI RIYALS VALUATION, EYES GLOBAL EXPANSION



Everyone's Smart University Holding Group has achieved a new milestone reaching a valuation of 4 billion Saudi riyals. This success is attributed to the group's careful efforts to adapt to the changing needs of the financial markets.

To evaluate its digital and financial assets, the group enlisted the services of Estidama Company. The comprehensive assessment conducted by the company determined the substantial value of the investment group at four billion Saudi riyals, considering factors such as financial performance and real profits.

Everyone's Smart University Expressing gratitude to all partners, Counsellor Nasser bin Ibrahim AlMohaimed, the Chairman of the Board of Directors, assured a dedicated pursuit of their aspirations for both international and local expansion. He underscored the commitment to improving the

quality of outputs from affiliated entities, with the goal of achieving advanced results in international classifications.

In addition to the financial achievement, the group has taken a proactive step by formally requesting approval from Saudi Arabian authorities to establish a branch of one of its universities. This strategic move aligns with the group's international expansion strategy, aiming not only to contribute to the spread of science and knowledge but also to enhance the group's global presence.

As Everyone's Smart University Holding Group celebrates this notable financial success, it stands ready for further growth and impact on the academic landscape, both within the country and internationally. The group's commitment to quality and expansion reflects its dedication to making a meaningful contribution to education and global knowledge dissemination.



CONTINUOUS IMPROVEMENT

A HALLMARK OF OUTSTANDING INSTITUTIONS

We cannot deny the role of leaders in eminent institutions. They are leaders by exception. Strong leadership, coupled with a clear vision, acts as the guiding compass steering institutions towards their goals. Visionary leaders set the tone for the institution's progress and inspire faculty and students to ascend to new heights).

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In the vast expanse of education, the journey towards institutional greatness is paved with commitment, innovation, and an unyielding commitment to excellence. An exceptional institution stands as a testament to its academic prowess and the guiding principles etched into its very core. This article is an attempt to define pillars that elevate exceptional institutions to unparalleled heights.

In a great institution, the academic foundation transcends the mere dissemination of knowledge; it's an endeavour to instil values that mould students holistically. Exceptional institutions try to be realistic and prioritize sustainability, ethical

conduct, inclusivity, and a commitment to societal well-being. These values form the guiding principles students carry into their professional and personal lives. They have every reason to become a strong force in the society. Moreover, as the educational landscape evolves, exceptional institutions stand at the forefront of pedagogical innovation. Embracing diverse teaching methodologies, technology integration, and experiential learning, they ensure that students are active participants in their educational journey, not just passive recipients of information.

Faculty are the essential and critical stakeholders of any institution. The exceptional institutions boast educators who transcend being subject matter experts; they are inspirational mentors. These educators bring a wealth of knowledge, distinctive pedagogical styles, and a commitment to fostering an environment that sparks intellectual curiosity. The best and effective faculty members have high sense of ownership and are highly engaged in research through institutional support.

Continuous improvement, a hallmark of outstanding institutions, is facilitated through dynamic evaluation and feedback mechanisms. Regular assessments and constructive feedback create an environment where students and faculty thrive, fostering a culture of excellence and perpetual growth. Recognizing that education extends beyond the classroom walls, outstanding institutions place a premium on crafting a holistic student as well, as faculty experience. This involves providing opportunities for extracurricular activities fostering a supportive



community, and offering resources that contribute to students' and faculty overall well-being.

We cannot deny the role of leaders in eminent institutions. They are leaders by exception. Strong leadership, coupled with a clear vision, acts as the guiding compass steering institutions towards their goals. Visionary leaders set the tone for the institution's progress and inspire faculty and students to ascend to new heights. Their adeptness in navigating challenges and adapting to evolving landscapes shapes the unique identity of any institution. They are committed to excellence and believe it's not merely a destination but an ever-evolving journey that propels boundaries, establishes new standards, and demands a perpetual commitment to dedication, hard work, and continuous improvement.

Every facet, from program initiation to daily operations, is conducted precisely, ensuring a seamless and efficient environment. This meticulous attention to detail becomes the canvas upon which transformative learning experiences are painted. One of the best qualities of great institutions is that they believe that complacency hinders progress. The perpetual quest for improvement entails a readiness to adapt, innovate, and embrace change. This proactive approach ensures that the institution remains relevant and impactful in the ever-evolving educational landscape.

In conclusion, the pillars of excellence above can transform institutions into eminent ones. These great institutions can thrive with all the stakeholders and potentially transform societies.

MATHEMATICS CHALLENGE

CMT - SERIES PROBLEMS - by GANIT MATH (गणित मठ)

CMT-2020/ 48 :

For $x < 0, y > 0, \text{ and } z > 0,$

$$\text{If } \left(x + \frac{1}{x}\right)^4 + \left(x - \frac{1}{x}\right)^4 + 6\left(x^2 - \frac{1}{x^2}\right) + 4\left(x^2 - \frac{1}{x^2}\right) \left\{ \left(x + \frac{1}{x}\right)^2 + \left(x - \frac{1}{x}\right)^2 \right\} = 1296;$$

$$\left(y + \frac{1}{y}\right)^3 + \left(y - \frac{1}{y}\right)^3 + 6y\left(y^2 - \frac{1}{y^2}\right) = 2744;$$

$$\frac{(z^2 + 1)\left\{(z^2 + 1)^4 - 5z^2(z^2 + 1)^2 + 5z^4\right\}}{(z^2 - 1)\left\{(z^2 + 1)^4 - 3z^2(z^2 + 1)^2 + z^4\right\}} = \frac{29525}{29524}$$

And, $px + qy + rz = 118;$

$rx + py + qz = 119;$

$qx + ry + pz = 120 ;$

then,

$$\frac{p^2q - p^2r + q^2r - q^2p + r^2p - r^2q}{p^3(q-r) + q^3(r-p) + r^3(p-q)} = ?$$

ANSWERS:

CMT-2020/46 : 15 CMT-2020/47 : $\frac{1}{1008}$

Answers will be published in the next issue . You can ask any queries and send your solution to Email : ganitmath.india@gmail.com , M: +91 8826337312, 9711733366, Website : www.ganitmath.in
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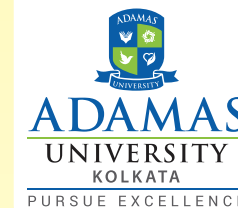
1. JSTSE, NTSE
2. KVPY SA, KVPY SX (AIR- 198)
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BPT

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College of Pharmaceutical Sciences

Pharm. D.

B. Pharm

M. Pharm

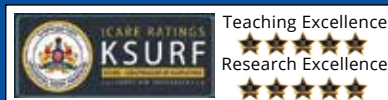
School of Medicine

Dr. Chandramma Dayananda Sagar Institute of Medical Education & Research **CDSIMER**

MBBS

This course covers all preclinical, para-clinical and clinical disciplines through theory classes and clinical training as mandated by the MCI guidelines.

Internship / Recruitment Partner For
all Health Sciences Programs



Admissions Helpline Nos:

080 4646 1800 **+91 6366885507**

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DSU City Innovation Campus : Kudlu Gate, Srinivasa Nagar, Hal Layout, Singasandra, Hosur Road, Bengaluru.

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