HE MATTERS
KERALA STATE HIGHER EDUCATION COUNCIL PUBLICATION
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HIGHER EDUCATION MATTERS

magazine

A GATEWAY TO HIGHER LEARNING INITIATIVES

monsoon hits college days

Monsoon disruptions and poor transport hinder college access, particularly for girls

Outcome Based Education Part-IV

Exploring the Three Domains of Learning

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Image: RADIO CU: Open Mic programme as part of Sasthrayaan 2025 at University of Calicut (Main Campus)

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HIGHER EDUCATION MATTERS

A GATEWAY TO HIGHER LEARNING INITIATIVES

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HE MATTERS

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Our aim is to serve students, teachers, administrators and other stakeholders by providing valuable insights into the educational scenario, innovations in teaching and learning, policy changes, and career opportunities. Whether you're navigating the challenges of administration, teaching the next generation, preparing for your future career, or thinking of transforming your educational landscape, this magazine is your first hand information and expert perspectives for your journey.

Questions & Comments may be sent to: contact.hematters@gmail.com

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Opening Note | Editor in Chief

Dear Readers,

As college admissions unfold across the country, this issue of Higher Education Matters arrives at a moment of great decision-making and self-discovery for thousands of students and families. The journey ahead is not only about choosing a college but about choosing a future—and in many ways, a philosophy of learning and living.

This edition resonates with the dynamism and challenges of the times. From coverage on the transition to four-year undergraduate programmes to deep reflections on institutional rankings, accreditation, public perception, and the nuanced role of Indian Knowledge Systems, readers are offered both guidance and provocation. We are reminded that choosing an institution is not only about prestige but about pedagogy, purpose, and potential.

We also highlight pressing concerns like inadequate student transportation and the inclusion of green and gender-sensitive education, while showcasing vibrant initiatives like hackathons, global education summits, and the push for AI-driven teaching tools.

In this evolving educational landscape—amid reforming policies, global political decisions, and digital revolutions—students must choose wisely and boldly. May this issue equip them to ask the right questions and envision an education not just as preparation for a job, but as a foundation for citizenship, creativity, and critical thought.

Warmly,
The Editor-in-Chief

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UPCOMING EVENTS

INCUBATE 2025

31 July 2025 at IIT Bombay's Powai Campus

INCUBATE 2025 is a prestigious, national-level Med-Tech Hackathon co-organized by the Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry, and the Indian Institute of Technology (IIT) Bombay. The event aims to bridge the gap between clinical insight and technological innovation by fostering close collaboration between medical and engineering students. Multidisciplinary teams of 2–4 members are invited to conceptualize and design practical, scalable healthcare solutions that address real-world clinical challenges faced by hospitals and healthcare providers.

Participants must submit a detailed concept pitch and a presentation by 31 July 2025, showcasing their proposed solutions' feasibility, technical design, and potential impact. A panel of experts from both institutions will shortlist the top 15 teams for the final round.

International Conference on Advancements in Power, Communication, and Intelligent Systems

19 to 21 August, 2025 at Tokyo, Japan

The World Conference on Education and Training (WCET 2025) will take place from August 19 to 21, 2025, in a hybrid format, with the in-person event hosted at the Hyatt Regency Tokyo, Japan. This international conference brings together educators, researchers, administrators, and policymakers to explore innovation across 18 thematic tracks, including higher education, educational technology, distance learning, teacher training, and education for sustainability. Participants can attend workshops, breakout sessions, and poster exhibitions, either in person or virtually. Abstract and registration submissions are open offering a platform for academic exchange, networking, and collaboration in shaping the future of education.

(ICMREST-2025)

8 to 9 August 2025 at Bangalore

The 3rd International Conference on Multidisciplinary Research in Education, Science & Technology (ICMREST-2025) will be held in Bangalore, India, on August 8-9, 2025. It is organized by ARSSS and aims to provide a platform for researchers, educators, and innovators to share research and practices across different disciplines. The conference will focus on promoting dialogue, fostering collaboration, and addressing challenges in education and science

International Conference on Quality Education 2025

10 to 15 August 2025 at Mumbai

The International Conference on Quality Education 2025 will be held from August 10 to 15, 2025, in Mumbai, organized by the International Association for Quality Education (IAFQE) in partnership with Indian institutions like Dayananda Sagar University. This hybrid event focuses on improving the quality of early childhood, primary, and secondary education, with themes including STEAM education, green learning, entrepreneurship, and SDG-aligned teaching practices. The conference features keynote sessions, school visits, expos, workshops, and cultural events, along with pre-conference online lectures. Educators, school leaders, and policymakers will also be recognized through awards for excellence in contributing to quality education.

Industrial Ideathon 2025

Last week of August 2025 at New Delhi

The Industrial Ideathon 2025 in Delhi invites 120+ student teams from engineering, design, and business backgrounds to solve real-world industrial challenges. Each team must include at least one female member, promoting gender diversity in STEM. Participants will present innovations in green energy, manufacturing, logistics, and frontier technologies, competing for a prize pool of ₹80 lakh. Organized with government and industry support, the ideathon aims to foster a culture of applied research and entrepreneurship. The event blends innovation, skill-building, and inclusion—aligning with India's drive for Atmanirbhar Bharat and Make in India goals.

DGT & Shell Launch Green Skills and EV Training for Youth

Runs periodically

The Directorate General of Training (DGT) and Shell India have launched a Green Skills and Electric Vehicle (EV) Training programme to equip youth with future-ready skills in green energy and mobility. Implemented by Edunet Foundation, this initiative is active across select ITIs and NSTIs in Delhi-NCR, Gujarat, Maharashtra, Tamil Nadu, and Karnataka.

The programme offers three tiers of training: a 240-hour advanced EV Technician course at 4 NSTIs, a 90-hour job-oriented EV skills course at 12 ITIs with dedicated labs, and a 50-hour foundational green skills module at additional ITIs. Participants will receive hands-on training in EV systems, diagnostics, battery technology, and safety protocols. Faculty members are also trained through Training of Trainers (ToT) sessions, and all successful candidates will receive co-branded certification from DGT and Shell, along with structured placement support. To apply, students should contact their nearest participating ITI or NSTI for details on registration and course schedules. Early inquiry is encouraged due to limited seats. This initiative aligns with India's green economy goals and empowers students with real-world, industry-aligned skills for the future of clean mobility.

New Age Education Summit 2025

2 August 2025 at Mumbai

The New Age Education Summit, scheduled for August 2 at Radisson Hotel, Goregaon, Mumbai, is a focused event exploring innovation in learning methods and school transformation. It will cover emerging trends like gamification, personalized learning, hybrid classrooms, and mental health in education. With educators, school owners, consultants, and EdTech firms in attendance, the summit offers keynote addresses, innovation showcases, and panel debates. It emphasizes integrating technology into pedagogy and creating learner-centric environments. The event is ideal for those seeking practical insights and collaborations in modernizing India's K–12 and higher education landscape.

10th Global Education & Skill Summit (GESS) 2025

8–9 August 2025 at Delhi

Scheduled for August 8–9 in Delhi, the 10th GESS is a premier hybrid event bringing together stakeholders from school education, higher education, EdTech, and skill development sectors. The summit will feature keynote speeches, panel discussions, and innovation showcases, focusing on transformative learning, digital classrooms, and NEP implementation. Over 100 speakers and 750 delegates are expected, including policymakers, education entrepreneurs, and institutional leaders. The event offers networking, workshops, and an education innovation awards ceremony, making it a vital forum for shaping the future of learning and workforce readiness in India and globally.

33rd World Education Summit (WES) 2025

19-20 August 2025 at Delhi

The 33rd World Education Summit (WES) 2025, set to take place in New Delhi on August 19–20, is recognized as one of Asia's most influential and far-reaching platforms for thought leadership in education. Organized by Elets Technomedia, WES has evolved over the years into a key convergence point for top-tier policymakers, educationists, university chancellors, school principals, EdTech entrepreneurs, international delegates, and global development agencies.

This year's summit will focus on "Transforming Learning Ecosystems through Innovation and Inclusion," addressing key themes such as digital transformation in education, integration of emerging technologies, AI-driven learning platforms, future-ready curriculum frameworks, sustainable school infrastructure, and bridging urban-rural education gaps. Special emphasis will be placed on implementing National Education Policy (NEP) 2020, fostering public-private partnerships, and promoting equity and access in learning.

monsoon hits college days

Students, particularly girls, encounter major difficulties because of insufficient public transportation options for travelling to and from colleges and schools. Additionally, their weekday schedules are frequently disrupted by orange and red weather alerts during the monsoon season. Moreover, many academic days have been significantly impacted by sudden, intense rainfall across Kerala during the monsoon

Students' Struggle in heavy rains and lack of public Transportation

This article serves as an initial discussion on public transport and commuter facilities for students, elderly individuals, and women. Access to public transport is vital for these groups in our society. Despite enhancements in regular travel services, especially in Thiruvananthapuram, the public transport system continues to be insufficient in numerous semi-urban and rural areas of the state. Addressing this issue demands coordinated collective actions.

In the lush green landscape of Kerala, where the monsoon rains paint a picturesque backdrop, lies a persistent challenge for students and elderly people alike: the lack of adequate bus services connecting academic institutions with their residential areas. In spite of the fact that many institutions provide their own bus services for students and staff including government run institutions, there is a large majority of students especially girls struggle with inadequate transit options particularly in the semi urban and rural parts of the State.

For years, this deficiency has cast a shadow over the convenience of commuting, especially during the relentless downpours of the monsoon season. Earlier, it was not uncommon to witness the student-only or ladies-only buses particularly buses operated by Kerala State Road Transport Corporation (KSRTC) buses, but now a days, such buses are rare to see.

The shifting monsoon patterns, particularly during June and July, have had a considerable impact on academic activities in schools and colleges across Kerala. In recent years, intense and erratic rainfall has led to frequent class disruptions, school closures, and delayed academic schedules. According to reports from the Kerala State Disaster Management Authority, several districts have lost over 10–15 instructional days annually due to heavy rains, floods, and related calamities—especially since the major floods of 2018 and 2019. This recurring weather volatility continues to pose a challenge to maintaining consistent academic calendars in the State.

According to the Kerala State Planning Board's Economic Review 2023, the number of private buses in Kerala declined significantly from 19,145 in 2016–17 to 10,304 by 2022–23, out of a total fleet that also shrank from 25,449 to 14,317 during the same period. This sharp reduction reflects operational and financial stress faced by the sector, especially after COVID-19.

Shifting Monsoon Patterns and the Rise of Mesoscale Weather Extremes

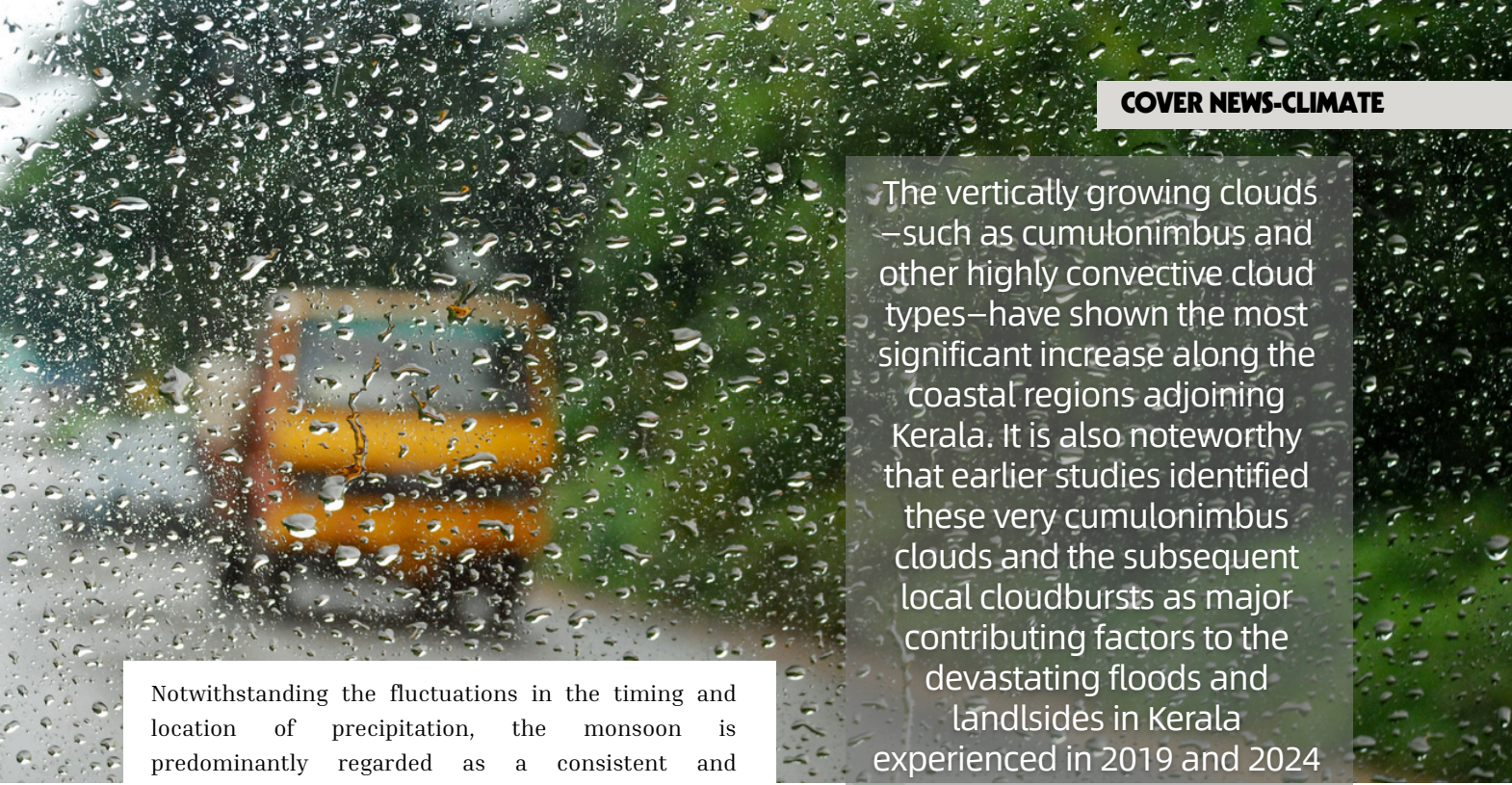
Abhilash S

The 6th Assessment Report by Intergovernmental Panel on Climate Change (IPCC) states with high confidence that human contribution to global warming is causing increasing frequency and severity of hot extremes worldwide, and many of these extremes were virtually impossible without climate change. The planet's average surface temperature has climbed 1.2 degrees Celsius compared to 1850-1900 baseline period. It has been hypothesized that every 1 degree temperature rise increases atmospheric water availability by 7%, causing heavier rains and rapid runoff. Increasing temperature can increase land evaporation, intensifying the dry season and drought. The faster water cycle caused by global warming can worsen floods and droughts.

The term "monsoon" is derived from the Arabic word "mausim," which means "season." The most significant feature of the monsoon is the significant seasonal variation in rainfall and winds. The seasonal variation in the direction of the surface winds has been the traditional method for identifying monsoonal regions. India is primarily an agricultural nation, and rainfall is the most significant and cost-effective source of water for agriculture. Consequently, it is of great importance to the agricultural sector. Approximately 80% of the annual rainfall in the Indian region is attributed to the Indian summer monsoon.

The Indian monsoon, vital for agriculture, faces increasing unpredictability due to climate change, affecting rainfall patterns and extreme weather events

India is considered as the land of monsoons. The impact of global warming due to GHG emission and counteracting impact of aerosol loading and cloud albedo feedback makes it difficult to produce reliable projections of Monsoons. However, IPPC report says with high confidence that, monsoon will become more erratic in such a way that, with warmer climate, wet and prolonged dry conditions will amplify further with possible implications for severe floods and prolonged drought conditions. However, frequency and location of these events depends on the projected changes in the regional circulation patterns. The slowdown of tropical circulation can partly offsets by warming induced strengthening due to heavy precipitation events over Indian region. Though, spatial and temporal variabilities are inherent part of Indian monsoon, there are preferred regions of deep clouds especially over Central India, North east India and northern parts of the Western Ghats regions. These are the potential breeding zones of cloudburst to mini cloudburst events and under warming climate, these regions may gets expanded and more and more regions in India will become prone to severe flash flood events.



The vertically growing clouds –such as cumulonimbus and other highly convective cloud types–have shown the most significant increase along the coastal regions adjoining Kerala. It is also noteworthy that earlier studies identified these very cumulonimbus clouds and the subsequent local cloudbursts as major contributing factors to the devastating floods and landlsides in Kerala experienced in 2019 and 2024

Notwithstanding the fluctuations in the timing and location of precipitation, the monsoon is predominantly regarded as a consistent and dependable component of India's climate. Recently, there have been significant alterations in the overall pattern and behavior of monsoon rains, characterized by an increased frequency of heavy rainfall and prolonged dry periods. In recent years, there has been a significant rise in the formation of low-pressure systems (LPSs) coinciding with the commencement of the southwest monsoon.

Along with the changes in the rainfall intensity and distribution, changes in the cloud structure especially along the mountainous terrains of the Western Ghats and Himalayan regions making those regions hotspots for cloudburst and Mini cloudburst events. Minicloud burst are another classification of intense short spells which may not exceed 10cm in one hour, the classical definition of cloud burst by India Meteorological Department. However based on the damage potential associated with less intense rain spells with rain intensity greater than 10 cm in 2 hours may cause flash floods and landslide along the slopes of Western Ghat mountains and Himalayan regions. Heavy rainfall for short duration especially from mesoscale mini cloudburst events also brings runoff water beyond the carrying capacity of the streams and flush off rain water more faster and rivers and mid land regions of the west coast often may experience frequent occurrence of flash floods. The combined effects of cloudburst, land slides and flash floods may get aggravated in the presence of degrading lands due to human activities such as quarrying, conversion of forest land to plantation and crop field.

A recent work published in npj Climate and atmospheric sciences by Sreenath etal (2022) reported a shallow to deep transformation in the cloud depth over the west coast of India during the recent decades of monsoon season. Notably, these vertically growing clouds—such as cumulonimbus and other highly convective cloud types—have shown the most significant increase along the coastal regions adjoining Kerala. It is also noteworthy that earlier studies identified these very cumulonimbus clouds and the subsequent local cloudbursts as major contributing factors to the devastating floods and landlsides in Kerala experienced in 2019 and 2024. The shift in cloud characteristics towards more explosive structures is now being observed as an emerging pattern along the west coast. The increasing frequency of deep convective cloud formations has emerged as a key driver of the squally weather conditions accompanied by intense lightning activity observed in recent times. These systems pose multiple hazards, including episodes of heavy rainfall, and represent a growing concern for weather-related risk assessment and disaster preparedness.

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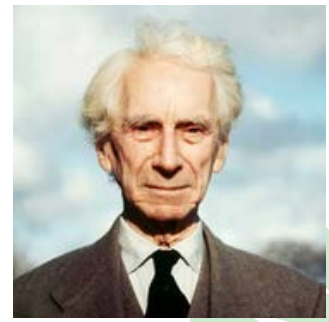


> The acquisition of knowledge is a matter of great joy, and it brings a sense of peace and satisfaction
>
> Bertrand Russel

Navigating the Shift: Choosing the Right Path in the Transition to Four-Year Undergraduate Programs

What to look for?

Jithin Mohan was one among many students of +2 grade along with their parents were at crossroads while choosing an appropriate institution for his higher studies. They are grappling with a crucial decision: the choice of one's pursuing undergraduate program. Especially to those who seeks something different than the conventional choice of professional programmes—an educational path that resonated with one's passions. This is particularly relevant in the context of transitioning our higher education degrees from three-year to four-year programs. There are wide range of possibilities in selecting programmes and courses in the current FYUG programmes.

Which is the Best College ?

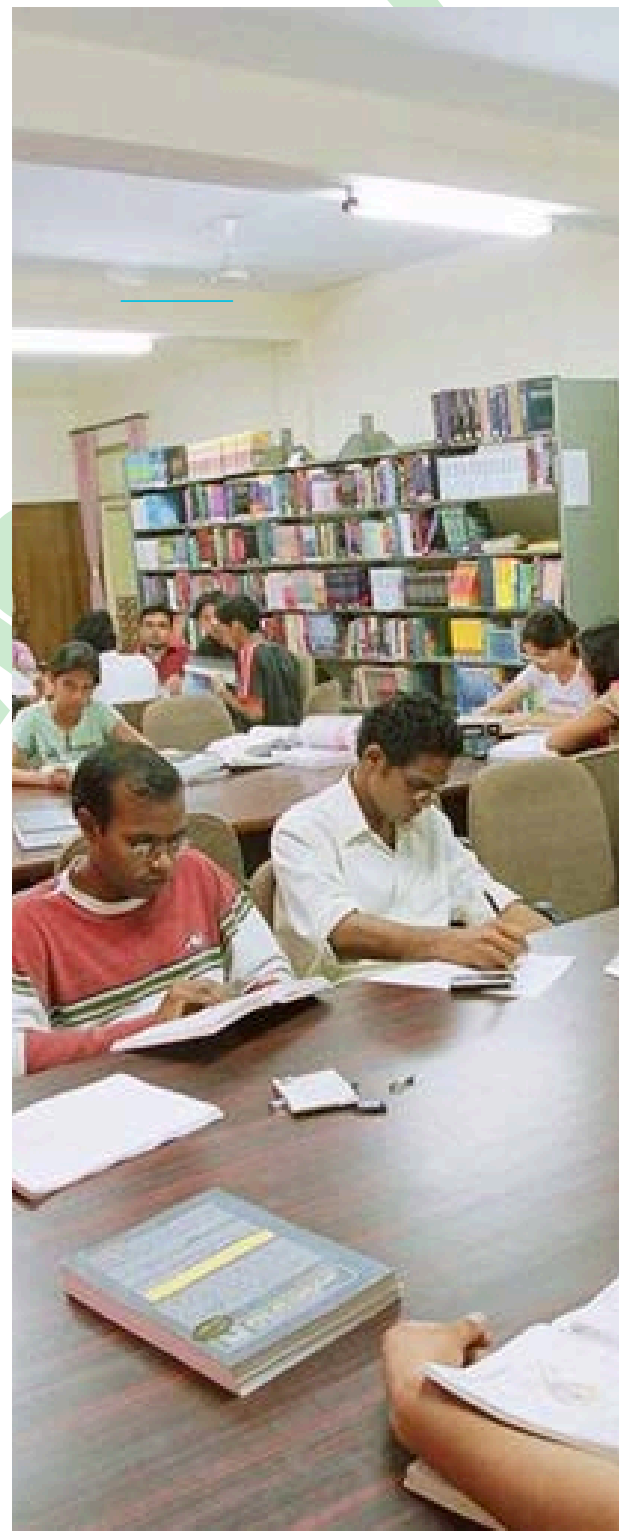
Many students and parents are increasingly showing less interest in conventional academic programmes or navigating the complex maze of entrance examinations for various professional courses. Instead, their focus is shifting toward general degree programmes in the Arts and Science domains. This shift in preference is often motivated by a desire for broader, interdisciplinary education that aligns with their interests and career aspirations beyond the technical fields.

However, for these students and their families, a new challenge arises—choosing the right college and programme of study. With a wide range of institutions offering diverse Arts and Science programs, making an informed decision can feel overwhelming. The primary concern is not only about finding a college that offers the desired courses but also about selecting one that maintains a strong reputation for academic excellence and future career prospects. Given that the ranking of institutions can significantly influence their decision, they need to consider factors such as the college's accreditation, faculty quality, campus facilities, placement records, and overall ranking in national and international educational lists.

The availability of accurate and reliable information about educational institutions is often limited for the general public. Instead of easy access to objective data, most people are exposed primarily to promotional material and advertisements from the institutions themselves. This creates a gap in public awareness, as many individuals lack access to authentic, detailed information regarding the true quality of these institutions, especially those located nearby. Furthermore, the academic programmes offered by different institutions can vary significantly in terms of content, resources, and overall quality. Unfortunately, this variability is often not well understood by prospective students or their families, making it difficult for them to make informed decisions.

However, for these students and their families, a new challenge arises—choosing the right college and programme of study.

Thus, navigating this process requires careful evaluation of multiple aspects, from the college's ranking to the specific strengths of its academic departments. For students and parents in search of quality education in non-professional domains, this decision-making process becomes crucial to ensuring a fulfilling and successful educational experience.



Top 10 Considerations for UG admissions

1. Institutional Ranking and Reputation

- **National and State Rankings:** Rankings from reputable agencies, such as the National Institutional Ranking Framework (NIRF), provide an insightful overview of institutions at both the national and state levels. Additionally, the Kerala Institutional Ranking Framework (KIRF) published its latest report that offers specific rankings for institutions within Kerala.
- **Global Rankings:** Increasingly, many institutions in India and Kerala are gaining global recognition, competing with international standards in terms of academics and infrastructure. Many Indian institutions have made significant strides in global rankings such as the Times Higher Education (THE) World University Rankings, QS World University Rankings, and others.
- **Subject-Specific Rankings:** For students focused on a specific field of study, it's important to look into rankings that evaluate institutions based on their performance in that particular discipline. NIRF, for example, provides rankings that are tailored to different subjects, helping students make an informed decision based on their academic interests.

2. Perception and Prestige

- **Student Enrollment and Retention:** Positive perception attracts more prospective students to apply and enroll. It also influences current students' decisions to remain at the institution.
- **Employer Perception:** Employers often consider an institution's reputation when recruiting graduates. A strong reputation can enhance graduates' employability and career prospects.
- **Research Opportunities:** Institutions with a positive image attract collaborations with other academic institutions, industry partners, and government agencies for research grants and projects.

3. Accreditation and Assessment

- **Accrediting Bodies:** Ensure the institution is accredited by bodies like NAAC (National Assessment and Accreditation Council) or NBA (National Board of Accreditation) or State Assessment and Accreditation (SAAC) and Kerala Institutional Ranking Framework (KIRF) for Institutions in Kerala.
- **Grades and Scores:** Look at the grades awarded by these bodies; higher grades often indicate better quality education and facilities.

4. Accessibility & Facilities

- **Facilities:** Most people consider the classroom facilities, lab equipment, libraries, and ICT tools. in colleges. In Kerala, SAAC gives weight to eco-friendly campuses and smart classrooms. Colleges with well-developed infrastructure enable seamless practical learning, especially in science, IT, and media-related courses.
- **Geographical Location:** Although the proximity to home is a criteria, ease of access via public transportation, and availability or hostel accommodation play important role.

5. Nature of Academic Programs

- **Course Offerings:** Availability of a wide range of courses and flexibility to switch majors or take interdisciplinary courses are now very important especially in the context of FYUGP.
- **Special Programs:** Honors programs, double degrees, and international exchange programs, dual programmes, twinning programmes are some of the interested nature of programmes in new system.

6. Innovation and Entrepreneurship Ecosystem

- Whether the college supports student startups, innovation cells, or links with Kerala Startup Mission (KSUM). Institutions with IEDC cells that encourage entrepreneurship and innovation culture.
- **Financial Aid:** Availability of institution endowments, ease of providing fellowships or grants or freeships, and other financial assistance programmes offered by the institution.

7. Infrastructure and Facilities

- **Campus Facilities:** Quality of classrooms, smart classes, resourceful libraries, laboratories with scientific equipments, sports and cultural activities & facilities, and student hostels and capacity.
- **Technological Resources:** Availability of modern technological tools, internet access, and online learning resources, LMS or hybrid learning methods.

8. Student Life and Extracurricular Activities

- **Campus Life:** Clubs, societies, cultural activities, and overall campus learning and vibrant environment.
- **Support Services:** Availability of counseling, career services, health services, and mentorship programs, skill acquisition programmes etc are essential for an Institution. Check their website for clarity and ensure that details are clearly given before choosing that.

9. International Exposure

- **Exchange Programs:** It is important to look for the availability of collaborative initiatives with foreign universities /institutions of international repute for various student exchange programmes.
- **Internship facilities:** It is essential to have tie up with quality institutions or industry/society for enabling better internship opportunities. Quality in utilising the internship portals offered by State and central governments.

According to the QS World University Rankings 2026 published last week, three Indian institutions made it to the top 200 list: IIT Delhi at 123rd place, IIT Bombay at 129th, and IIT Madras at 180th.

IIT Madras showed the most dramatic rise, climbing 47 spots from 227th in 2025. IIT Delhi also advanced significantly, moving up 27 ranks from its previous position of 150. Meanwhile, IIT Bombay saw a decline, dropping 11 places from its 2025 rank of 118.

10. Additional Considerations

- **Placement Records:** Historical data on placement rates, companies visiting the campus, average salary packages, and internship opportunities. This is important in the case of arts and science colleges also.
- **Class Size:** Although it has certain statutory obligations, smaller class sizes often lead to better student-teacher interaction.
- **Teaching Methods:** The incorporation of modern teaching methods, such as practical training, internships, and project-based learning, is essential. This includes technology-driven approaches like hybrid learning, LMS-based instruction, and more. In other words, it is important to assess whether teachers are genuinely equipped with the digital tools necessary to conduct smart classes.

Public Perception

Does public perception of a college matters really?

Higher education institutions are making every effort to improve their scores in assessment and ranking schemes, such as the National Assessment and Accreditation Council (NAAC), the National Institutional Ranking Framework (NIRF), and the Kerala Institutional Ranking (KIRF), among others. Significant improvements in these ratings are essential for their survival in today's highly competitive educational landscape.

An institution can enhance its public perception through various efforts. This may include ensuring high academic standards and hiring experienced, respected faculty members. It is also important to maintain a strong curriculum delivery system that adapts to changing educational needs. Providing robust student support services and career counseling is crucial. Ensuring high graduation and employment rates further strengthens an institution's reputation.

Institutions can also engage with the local community through service projects, partnerships, and events, showcasing their commitment to societal well-being. Maintaining open and honest communication with stakeholders, including parents, students, and the community, about achievements, changes, and challenges is key. Building strong relationships with alumni, highlighting their successes, and involving them in mentoring and networking opportunities can contribute positively to public perception.

Investing in state-of-the-art facilities, technology, and resources is important to create a conducive learning environment. Additionally, utilizing effective marketing strategies and media relations helps highlight the institution's strengths, successes, and unique programs.

One global example of public perception significantly impacting an educational institution's growth and goals is the case of Harvard University. Despite ranking highly in various accreditation systems such as the U.S. News & World Report and having strong NAAC-like evaluations, Harvard's public perception, largely driven by its alumni, legacy, and global recognition, plays a crucial role in attracting top-tier students and faculty, as well as major funding. This perception of excellence often goes beyond any ranking mechanism and shapes its continued dominance in the educational sphere.

In India, one prominent example is the Indian Institute of Technology (IIT) Bombay. Despite the presence of formal ranking mechanisms like the National Institutional Ranking Framework (NIRF) and accreditation bodies such as NAAC, the public perception of IIT Bombay plays a critical role in its success. It is widely regarded as one of the top institutions in the country, not just because of its rankings but due to its historical reputation, alumni network, and societal impact. The strong public perception of IIT Bombay attracts top-tier students, global collaborations, and significant funding, beyond what rankings alone can explain.

Public perception, while not always in line with ranking mechanisms or accreditation criteria, can influence an institution's success. These perceptions are shaped by a variety of factors, including media portrayal, alumni success, societal impact, and word of mouth.

The Abductive Discovery Process in Scientific Reasoning

Exploring the Role of Abductive Reasoning in Scientific Discovery: A Process that Generates Innovative Hypotheses and Uncovers Deeper Principles in Physics and Beyond

Gangan Prathap

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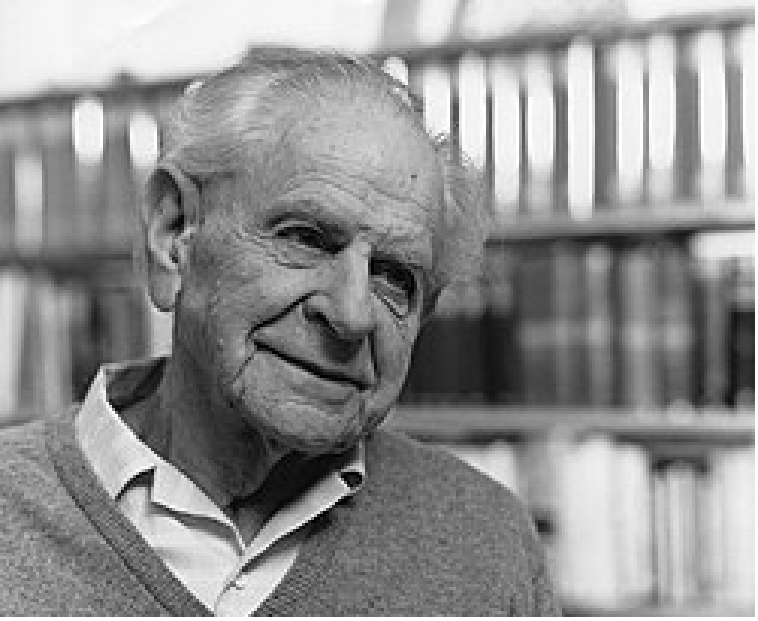
1. Introduction:
The Role of Abduction in Science

Scientific reasoning has traditionally been framed in terms of deduction (deriving conclusions from general principles) and induction (inferring general laws from observations). However, major scientific breakthroughs often begin with abduction—a form of reasoning that generates the best explanatory hypothesis from incomplete data.

This distinction aligns with Karl Popper's concept of the Logic of Discovery (how hypotheses are formed) versus the Logic of Justification (how they are tested and validated). While traditional science education focuses on justification, many of the most significant discoveries in physics arose through abductive reasoning—where an unexpected structural insight suggested a deeper unification of concepts.



2. The Duality of Kinetics and Kinematics

A striking example of abductive reasoning in physics can be found in the interplay between kinetics (forces, without direct reference to motion) and kinematics (motion, without direct reference to forces). Classical mechanics treats these as separate domains, yet their deep interconnection suggests a more fundamental principle.

- Kinetics focuses on force interactions, energy, and impulse, but does not specify how an object moves as a result.
- Kinematics describes motion in terms of velocity, acceleration, and displacement but does not account for the causes of motion.
- The apparent separation between the two invites an abductive question: Is there a missing link that unifies these descriptions?

The Newtonian equation of motion, , is often taken as a fundamental postulate. However, by approaching it abductively, we can derive it from deeper principles such as:

- **Thermodynamic principles:** Systems evolve toward configurations that minimize certain energetic constraints, suggesting that force and acceleration are related via a conserved quantity.
- **Entropy and information considerations:** The evolution of dynamic systems suggests a preference for descriptions that maximize predictability, reinforcing a relationship between force, mass, and acceleration.
- **Kinematic-kinetic duality:** The simplest transformation between force-based (kinetics) and motion-based (kinematics) descriptions leads to a proportionality that naturally gives rise to Newton's Second Law.

This approach reframes not as an arbitrary axiom, but as a consequence of deeper physical constraints—uncovered abductively.

3. Broader Implications: Abduction in Science and Beyond

Recognizing abduction as a core component of scientific discovery has significant implications:

- **Improving scientific pedagogy:** Teaching physics as an exploratory process rather than a fixed set of laws can foster deeper understanding and innovation.
- **Guiding interdisciplinary research:** Many breakthroughs occur when patterns from one domain are abductively transferred to another (e.g., thermodynamic entropy and information theory).
- **Shaping future scientific inquiry:** By explicitly recognizing abductive reasoning, we can refine our approach to problem-solving, allowing for more creative and structurally insightful hypotheses.

> ***By formalizing and teaching abduction alongside deduction and induction, we can cultivate a more comprehensive understanding of scientific reasoning***

4. Conclusion

The abductive approach is not only how discoveries like Newton's Laws, Einstein's Relativity, or quantum mechanics emerged—it remains vital for uncovering new physical principles. By formalizing and teaching abduction alongside deduction and induction, we can cultivate a more comprehensive understanding of scientific reasoning.

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The Integration of Indian Knowledge Systems into Syllabus Promotes Hinduization of Education

CP Rajendran

The National Education Policy (NEP) 2020 has emphasized the integration of IKS into the education system at all levels—school, college, and research. If one carefully examines the statements and policies of the country's politicians and policymakers, it becomes evident that the Indian Knowledge System (IKS) is a political project aligned with the Hindutva ideology of the ruling regime.

A critical analysis of the IKS reveals that it predominantly focuses on ancient India—specifically Hindu India—while sidelining other rich intellectual traditions. The proponents of IKS rarely acknowledge materialist and agnostic schools of thought, such as Charvaka, Buddhism, and Jainism, which actively challenged Vedantic traditions in ancient India. Moreover, the contributions of Muslim scholars and intellectuals, who were integral to India's heritage, are either ignored or disparaged. This selective representation stands in stark contrast to how other civilizations—such as the Greek city-states, the Roman Empire, Arabia, China, and Egypt—celebrate their diverse intellectual traditions.

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