Monday, January 13, 2025
CHENNAI

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What have they learnt?

Outcome-Based Learning focuses on measurable skills and ensures that students are equipped for real-world challenges

M.G. Sethuraman

The Economic Survey 2023-2024 indicates that 65% of India's fast-growing population is below the age of 35. Of this, only 51.25% of the country's youth are employable. This is because they lack the skills needed for the current industrial sectors. The report highlights the fact that there exists a gap between what is taught in educational institutions and what is needed by industry and society.

Of late, there has been an increased effort to focus on the learner rather than the teacher in India. Intensive measures are being undertaken to bridge the gap between teaching and learning but the focus is on the process, not the outcome. Educational outcomes are the abilities the students acquire and demonstrate at the end of the learning experience. Hence the emphasis at the global level is on the educational outcomes.

What is OBE?

The Learning Outcome Framework (LOCF), which has been adopted in India, expects the teachers to visualise what the students will be able to do by undergoing the course/programme and how to measure their ability to do what they should and to facilitate acquisition of the ability expected of them. Outcome-Based Education (OBE) requires that the curriculum, pedagogy and assessment focus on student learning outcomes. This method of curricular design and teaching pre-fixes how students can apply their knowledge and skills after they complete a course/programme. Thus, the learning outcomes are predecided and the course content, delivery and assessment are planned to achieve the desired outcomes, which need to be well-defined, realistic and measurable.

The advantage of adoption of OBE based approach is that both students and the teachers are aware of the desired outcomes from the beginning. Further, the approach trains students working towards the goal. The teaching and assessment methodologies need to be more flexible enabling students to showcase their mastery. National agencies like National Accreditation Assessment Council (NAAC) and National Bureau of Accreditation (NBA) emphasise the adoption of LOCF and expect the institutions to spell out the Graduate Attributes, Programme Outcomes and Course Outcomes. Institutions should also periodically check for the attainment of these outcomes, so that remedial measures can be undertaken both at the institutional level and personal level.

To enhance the employability of learners, the teaching and learning process must be changed. Online education has changed classroom teaching and experiential learning and problem-solving skills with an application-oriented approach can produce the right impact. Higher Educational Institutions (HEIs) should turn into centres where talent nurturing is given priority. Even assessment methodologies need to change and test higher-order thinking skills and promote critical thinking and problem-solving abilities.

However, it is not enough to just design a purposeful curriculum. Teachers also need to be trained in this novel approach. Moving towards a student-centric approach from a teacher-centric one is a challenge as is fine tuning the academic curriculum to the changing needs of the industry with the available expertise in educational institutions. However, this can be overcome by involving industrial experts.

With the National Education Policy (NEP) 2020, emphasising the adoption of the Learning Outcome Framework in HEIs, the OBE model of education, which aims to bring out the graduate's potential, will enhance the employability potential of the graduates.

The writer is Professor, Dean, School of Sciences and Senior Prof of Chemistry, Gandhigram Rural Institute-Deemed To Be University.

SCHOLARSHIPS

University of Oxford Felix Scholarships
Offered by the University of Oxford, the U.K.
Eligibility: Indian nationals with a first-class Bachelor's or Master's degree from an Indian university, willing to pursue a full-time Master's or D.Phil. courses at the Oxford University
Rewards: Full course fees and other benefits
Application: Online
Deadline: January 31
www.b4s.in/edge/FOUS1

Tagore National Fellowship for Cultural Research
An initiative from the Ministry of Culture, Government of India
Eligibility: Indian or a foreign national with five years of experience in guiding or conducting research in art fields and have original research papers published in reputed and a refereed journals or books
Rewards: Up to ₹80,000 for two years, and other benefits
Application: Offline: Through post at Nodal Institutions under the Ministry of Culture, Government of India
Deadline: February 15
www.b4s.in/edge/TNFC4

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Offered by the National Commission for Women
Eligibility: Open to second-year students of Law, Sociology, Social Work or Gender studies. First-year students can participate in an unpaid internship.
Rewards: ₹10,000 monthly
Deadline: Round the year
Application: Online
www.b4s.in/edge/NWCI1

Courtesy: buddy4study.com

Diversify your options

Uncertain about your career options? Low on self-confidence? This column may help

OFF THE EDGE
Nandini Raman

I am from Ladakh and in the last year of my B.A. degree. I want to do an M.A. in History. Which of the Central Universities is best for this course? Karma

Dear Karma,

Some of the top Central Universities in India known for their History departments are Jawaharlal Nehru University (JNU); New Delhi School of Social Sciences (Centre for Historical Studies), University of Delhi (DU); Delhi, Banaras Hindu University (BHU), Varanasi' Hyderabad Central University (HCU), Hyderabad; Aligarh Muslim University (AMU), Aligarh; Pondicherry University, Puducherry; Tezpur University, Assam; and North-Eastern Hill University (NEHU), Shillong.

Check the specialisation areas offered by the departments. Some universities focus more on ancient or medieval history, while others emphasise modern or contemporary history.

Look for universities with renowned professors in the field of your interest and ones that provide strong research programmes for dissertation work during your M.A.

I am in Class 12 (Biology with Maths). I am taking the NEET exam but would like to know if there are any other options apart from Medicine. Divya

Dear Divya

A combination of Biology with Maths in Class 12 opens up a variety of career options beyond Medicine. Biotechnology blends biology and technology, Biomedical Engineering combines engineering principles with biological sciences, and Biostatistics or Bioinformatics involves statistical and computational techniques to biological data. Agricultural Science can be rewarding and diverse involving research in crop improvement, sustainable agriculture, and agricultural technology. Pharmacy courses, Forensic Sciences, Environmental Science, Food Technology, Genetics, B.Sc. in Clinical Research, Veterinary Science, and Allied Health Sciences offer a variety of paramedical and technical careers related to healthcare but not as doctors. Pure Sciences offer fields like Microbiology, Zoology, Botany, or Biochemistry, Data Science and Artificial Intelligence in Biology.

I dropped out of my Master's in English recently. I want to take the UPSC exams but am confused about whether to prepare for that and take another course or work while preparing. I'm not interested in academics now. What should I do? Bala

Dear Bala,

This is a common dilemma. Since you say that you are not interested in academics now, taking up another course right might not give you the desired results.

Picking up a job again depends on your financial stability. Will you be able to manage your time and the level of your commitment required for the UPSC exam preparation? How long do you give yourself for this exam? If you are highly motivated and can financially support yourself, focus on the UPSC preparation for the next 1-2 years. If you need more security, then work while preparing but you will need a lot of dedication, commitment and discipline. The UPSC is a highly competitive exam and demands a lot of time. Joining coaching classes, and attending mock tests could help create a focused routine. Get a realistic assessment of your finances, and assess your core motivation: is it a new course, a new job or cracking the UPSC? How much time are you willing to dedicate to prep every day? Most importantly, what is your Plan B beyond the UPSC? Work out the cost-benefit analysis and you will arrive at a reasonable decision.

I am doing a Master's in Statistics and also preparing for the UPSC. Are there any options apart from this? Do I have to do any additional courses to work in the private sector? Somya

Dear Somya,

Pursuing a Master's in Statistics while preparing for the UPSC provides you with a solid foundation for various career options, both in the public and private sectors. You could consider Data Science/Analysis, Actuarial Sciences, Market Research Analysis, Operations Research Analysis, Biostatistician, and Quantitative Analysis. Some additional courses that can enhance your employability and skill set in the private sector are Certifications in Programming Skills, Business Analytics, Machine Learning/AI, and Soft Skills Training. While these will enhance your skills, real-world experience is equally important. Seek internships to gain relevant experience and build your professional network. Attend workshops, seminars, and industry conferences to connect with professionals in the field.

Disclaimer: This column is merely a guiding voice and provides advice and suggestions on education and careers.

The writer is a practising counsellor and a trainer. Send your questions to eduplus.thehindu@gmail.com with the subject line Off the Edge

On the 'Rhode' to success

What is the Rhodes Scholarship? How does it benefit Indian students?

Madhuvanti S. Krishnan
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(From left) Recipients of the Rhodes Scholarships 2025 from India; Dhvani Mehta. FREEPIK AND SPECIAL ARRANGEMENT

Rayan Chakrabarti, a final-year Master's student from Jawaharlal Nehru University, New Delhi, plans to create a museum and document the impact of the COVID-19 pandemic in South Asia. Vibha Swaminathan, a final-year Law student at National Law School, Bengaluru, aims to study citizenship regimes and human rights litigation. Avanish Vats, a visually-impaired graduate from St. Stephen's College, New Delhi, is interested in epistemology and making philosophy accessible to people with disabilities. Shubham Narwal, a veterinarian at ICAR-Indian Veterinary Research Institute, Bareilly, plans to explore conservation strategies for the Great Indian Bustard. Pal Aggarwal, a B.Tech student from IIT-Bombay, intends to become an astronaut, and advocate for women in Science.

What do these youngsters have in common? They are all recipients of the Rhodes Scholarships 2025, which will enable them to pursue their higher education at Oxford University, the U.K. In September 2024, The Rhodes Trust announced the creation of a sixth Rhodes Scholarship for India. Dhvani Mehta, National Secretary, Rhodes Scholarship for India, talks about how the scholarship came to be, how it impacts Indian students, and more.

The beginning

Established in 1902 by Cecil Rhodes, a British financier who was Prime Minister of Cape Colony in the 1890s, the Trust now acknowledges the role of colonial wealth and discriminatory practices in laying the foundation for the scholarship. Today, steps are being taken to correct the mistakes of the past and make it more inclusive and equitable. "Earlier, scholarships were restricted to the U.S., Canada, Australia, New Zealand – in short, where the white man had made his mark. But the idea now is to ensure that more of the wealth on which the scholarship was founded goes back primarily to Africa, to which Cecil Rhodes owes a great debt, and to acknowledge other parts of the world where there has been a history of colonial rule and trauma," she adds.

The parameters on which the scholarships are awarded are the same across countries. "There is no variation in the criteria barring technical variations of age, eligibility, citizenship, educational requirements. But, the criteria mentioned in Rhodes' will – academic excellence; energy to use one's talents to the fullest, including excellence in co-curricular or extracurricular activities, and values or how one demonstrates truth, courage, devotion to duty, timeliness, and leadership – are still the basis on which the Trust awards the scholarships," explains Mehta.

Mehta busts the myth of a "typical Rhodes scholar". There is no 'type', she explains. In fact, the scholarship's strength lies in its diversity and the opportunity to meet different people while at Rhodes House. Another myth was physical prowess: that one had to excel in a sporting activity.

Back in 1903, the scholarship required applicants to be athletic and able men. But that isn't true anymore. The selection criteria mention 'energy to use one's talents to the full', but this can be shown through a range of extracurricular pursuits and leadership opportunities.

Tips for students

Mehta also shares tips for students who are planning their Rhodes journey:

Early start: Don't wait till you are in the final year of your UG to think about what your application will look like. The scholarship requires you to have demonstrated your engagement in extracurricular and leadership activities early on.

Authenticity: Don't engage in extracurricular or co-curricular activities only for the sake of the scholarship. The selection committee can make out which candidate is authentic and which ones are out for personal gain.

Introspection matters: Maintain an excellent academic record. Apply to the scholarship as an opportunity to introspect about the kind of person you want to be and the career you want to have. The committee wants to see a demonstration of committment to public progress.

Get acquainted: Research and zero-in on which course is most suited for you, as admission to Oxford is highly competitive. The Rhodes website has extensive information on eligibility, application process, deadlines, past students' experience, and more. This can be used as a primer before beginning the application process.

Be realistic: Apply to courses where you have a realistic chance of getting in and to those that have the coursework and professors that you are interested in learning from. Do your homework on what it is that you want to study, why you want to go to Oxford as opposed to other universities, and what the Rhodes community can offer.

For more details, visit https://tinyurl.com/yrxeedx2

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Invest in the people

To revitalise India's education system, it is imperative to prioritise teacher training, incentivise quality teaching, and create a supportive environment for both teachers and students

H.B. Raghavendra

Industry readiness is one of the graduate attributes in the outcome-based education framework. A recent revelation has exposed a critical factor in India's higher education system: a staggering 80% of graduates are deemed not fitting for industry roles. With nearly 50 million graduates entering the workforce annually, this alarming statistic raises serious questions about the quality and relevance of our education system.

While the tech industry often dominates the conversation, India's workforce is predominantly employed in sectors like services, construction, retail, and healthcare. Despite the rapid evolution of technology, these sectors continue to generate the majority of job opportunities. For instance, the personal grooming industry alone demands nearly 1.3 million professionals annually, significantly surpassing the 3-4 lakh jobs added by the software industry each year. Even for engineering graduates, the Internet provides a wealth of resources like NPTEL, Coursera, and SWAYAM. So, why do industries continue to lament the lack of employability among the majority of graduates? The issue, it seems, runs deeper than a mere skills gap.

India's higher education system faces growing criticism for its theory-heavy curricula going slow or improving skill sets. Critics argue that graduates lack the practical skills and industry relevance necessary for modern jobs. To bridge this gap, universities are incorporating experiential learning, internships, and soft skills training. Government initiatives like the National Education Policy (NEP) 2020 and platforms like SWAYAM and NPTEL aim to modernise education. However, the challenge remains: balancing academic rigour with industry demands to produce well-rounded graduates.

Major shift

India's higher education has seen a major shift, with faculty influence on students noticeably waning. Regulatory bodies like the UGC and AICTE have introduced reforms to modernise education by integrating online courses into the curriculum. While these changes support scale and accessibility, they tend to weaken traditional teacher-student bonds. Everybody recalls at least one mentor who profoundly impacted their lives. However, the shift towards online learning reduces chances for deep, lasting connections with faculty, making mentorship increasingly rare.

While online platforms offer vast resources, they cannot completely replace the personalised guidance and emotional support provided by dedicated teachers. The commercialisation of education, coupled with online tutoring, has further exacerbated the issue. The lack of nurturing from qualified and passionate teachers has hindered the growth of India's education system and its ability to produce skilled graduates. This has significant implications for the country's economic competitiveness and technological innovation. To revitalise India's education system, it is imperative to prioritise teacher training, incentivise quality teaching, and create a supportive environment for both teachers and students. By investing in human capital, India can produce world-class scholars and innovators.

Way forward

India's educational landscape, while embracing technological advancements, risks losing the invaluable human touch. The NEP 2020 is a step in the right direction, emphasising teacher quality and professional development. However, more substantial investments are needed to nurture a generation of passionate educators. By improving working conditions, providing adequate compensation, and fostering a supportive learning environment, India can ensure that teachers are empowered to inspire and guide students. Overlooking this human element could have unpleasant consequences. Countries like Argentina and Greece, despite producing highly educated individuals, have struggled with unemployment and economic stagnation. To avoid a similar trend, India has to prioritise teacher development and the cultivation of strong teacher-student relationships to equip its youth with not only knowledge but also the essential skills and mindset to thrive in the 21st century.

The writer is the Vice Chancellor CMR University, Bengaluru

The power of questions

Why B-Schools must incorporate the case study method in the curriculum

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Scott C. Beardsley

Tomorrow's workplace will see the proliferation of automation, robots, machine learning and artificial intelligence (AI). Data will go from big to colossal, and video-enabled collaboration will push teams further, faster. Exponential technological growth is changing work as we know it forever; yet key values endure.

AI's transformative technology will solve complex problems and enhance human capabilities across industries, yet it must be responsibly developed. AI is not only a technology challenge, it's a leadership opportunity. This is what business schools must focus on every day: How can we best prepare students for responsible leadership? How can we prepare them to lead others into the unknown and to create value and positive change in a world of new driving forces, including AI?

Active learning

The best preparation for future action is active learning. The Socratic method, complemented by the case study method, builds leadership capacity at a higher and faster rate than other methods of learning. In 2000 BCE, Socrates strolled through Athens' *agora* (marketplace) and shared his belief that true wisdom comes not from having all of the answers but in knowing how to ask the right questions. Questions peel away layers of assumption, encourage dialogue, make room for curiosity and innovation and require a strong dose of humility. This timeless posture of learning through questions – the Socratic Method – strengthens the muscle of critical thinking and develops the skills of collaboration and communication.

There are few business schools in the world that use the Socratic method and even fewer that underpin it with the case study method. Here's how it works: Faculty do not deliver lectures while students take notes. Instead, learners engage in active and experiential learning.

In the case study method, MBA students examine hundreds of real-life business case studies, replete with challenges and twists. They review these cases with their teams and come to class prepared to express their own formulated ideas and arguments and to *apply* their knowledge. Ethics, innovation and sustainability are themes woven across the curriculum. Up to 50% of a student's grade comes from participating in classroom conversation. The faculty orchestrate this symphony of ideas, opinion, debate and feedback, ensuring that the students learn not just from the professor but from each other.

Build leadership

Students also evaluate their purpose and articulate their values. They join learning teams and take on leadership positions in student organisations. Student self-governance means that students aren't just passengers; they are co-pilots. This interactive learning model teaches learners to solve problems with imperfect information, and to speak persuasively and confidently. Putting the learner in the role of the general manager builds leadership capacity and prepares them for the work they will be hired to do: to make recommendations for action.

The writer is Dean of the University of Virginia's Darden School of Business.

Catalyst to change

International exchange programmes in Law offer opportunities for students to develop their skills, broaden their horizons, and contribute to a more just and equitable world

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Deevanshu Shrivastava
Harshvardhan Tiwari

International exchange programmes in law courses have emerged as a pivotal force in shaping the legal landscape of the 21st century. They offer invaluable opportunities for law students to broaden their horizons, gain diverse perspectives, and develop the skills necessary to thrive in an increasingly interconnected world. While the long-term benefits of such programmes are undeniable, it is imperative to address the challenges, ensure inclusivity, prioritise sustainability, and embrace emerging trends to reach their potential.

Benefits and challenges

Students acquire a deep understanding of different legal systems, cultures, and ethical frameworks, enabling them to approach complex legal issues with a global mindset. They develop strong intercultural communication skills, fostering collaboration and understanding across borders. Additionally, these programmes enhance career prospects, providing students with a competitive edge in the global market. However, language barriers, cultural differences, and logistical complexities can pose obstacles. The cost of participation can also be prohibitive for many leading to limited accessibility. Institutions can address this by investing in language training, providing comprehensive support services, and exploring financial aid options.

Ensuring inclusivity is paramount and efforts should be made to attract students from diverse backgrounds, including those from under-represented groups. This can be achieved through targeted outreach, scholarships, and partnerships with organisations that promote diversity and equity.

Sustainability is another critical consideration. Institutions should strive to minimise the environmental impact by promoting sustainable travel practices, reducing waste, and supporting local communities. Additionally, efforts should be made to ensure that exchange programmes contribute to sustainable development goals and promote social justice.

Adapt to trends

As the legal landscape continues to evolve, such programmes must adapt to emerging trends, including online and hybrid formats, virtual internships, and collaborations with legal tech start-ups. This will help expand access, enhance the learning experience, and prepare students for the future. Law schools should integrate the knowledge and skills gained through exchange programmes into their curricula, ensuring that students can apply their experiences to their legal studies.

Recently, India has seen a shift in how exchange programmes function. More often, institutional collaborations have occurred concerning short-term study; credit transfers, and faculty transfers. The support system also includes monetary, manpower, and technical support. Institutions are developing clubs, committees, and offices to fulfil international collaboration aspects. This has also become a crucial factor in rankings and accreditations, whether it is the QS World University ranking, the Indian NAAC grading system, or other ranking frameworks. So, several universities and colleges are working towards and institutionalising international collaborations to provide win-win opportunities for both partner institutions. As academicians, we foresee a time when we will have a global education system where transferring grades, marks and assignments will be as easy as getting a flight to another nation. A Global Education Card that has grades, marks or academic credit entered and can be swiped in any education institution to continue their studies is an idea for the future.

Thus, international exchange programmes in Law courses offer a wealth of opportunities for students to develop their skills, broaden their horizons, and contribute to a more just and equitable world.

Deevanshu Shrivastava is Associate Dean and Harshvardhan Tiwari is Director, Law Admissions, G.D. Goenka University, Gurugram.

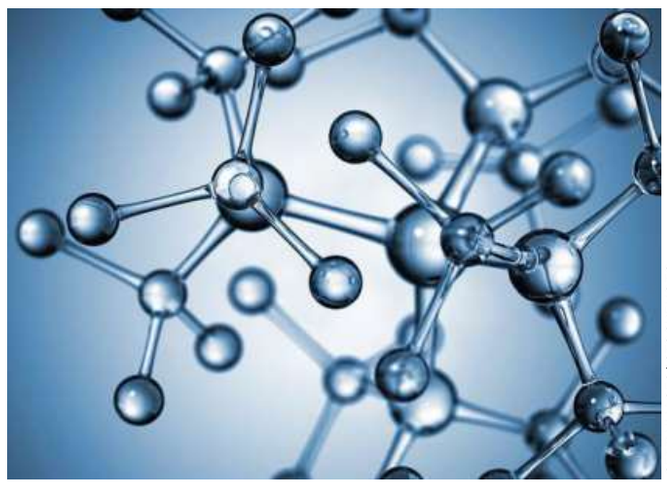
Building blocks of the future

A career in Materials Science and Engineering unlocks a host of possibilities, including in strategic sectors such as defence and aerospace.

Santanu Mandal

Students often aspire to become engineers or join the armed forces to be part of nation-building or defending the nation. A career in Materials Science and Engineering melds these two worthy aspirations.

In a sense, Materials Science remains foundational to human civilisation and its advancement. Through the ages, stone, metal and, now, polymers, ceramics and composites, have evolved from household usage to advanced structural and functional applicability across industries. As a Materials Scientist or Engineer, one can explore, unearth, and experiment with new materials integral to the technological advancements being used to address real-world problems today. Today, advanced materials are used across strategic sectors such as aerospace, defence, and space for wear resistance, corrosion resistance, electrical insulation, thermal insulation and more.



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Strong base

Contemporary Materials Science comprises three classes of materials: metals and alloys, ceramic and composites, and plastics and rubbers (i.e. polymeric materials). The main objective is to understand its structural makeup, properties in relation to bonding and structure, how it should be manufactured for defect-free reliable products, and how it performs in industrial and advanced applications.

Students require a strong educational base in Physics and Chemistry, Engineering, and industrial manufacturing processes. Those who have completed Class 12 with Physics, Chemistry and Maths can consider Materials Science and Engineering through national and state entrance exams. Undergraduate courses in Materials Science and Metallurgical Engineering are typically four years long. Those interested in R&D can opt for postgraduate courses and Ph.Ds. In India, the IISc, the IITs, the NITs and other universities offer courses such as Materials Science and Metallurgical Engineering, Ceramic Engineering, Polymer Technology or Metallurgy.

Careers

Depending on their skills and experience, materials scientists and engineers can consider the following options:

- Studying the applicability of various materials across industries as part of the selection and qualification processes in Product Engineering
- Analysing the materials' structure, composition, and properties at the atomic, microscopic, and macroscopic levels. This entails in-depth studies of the properties that help assess its performance, durability, reliability, environmental impact and viability for mass manufacturing
- Fostering new materials or refining available materials to acquire specific properties
- Understanding principal manufacturing processes such as powder preparation, forming processes, sintering, machining etc. as well as additive manufacturing (3D printing) techniques
- Developing prototypes and validation in application
- Failure mode and effect analysis, quality assurance and testing.

Nearly every engineered product requires the use of materials, which means that one can find employment even after graduation. Sectors that employ materials scientists include defence, aerospace, automotive, electrical, electronics, biomedical engineering, pharmaceuticals, sports-gear manufacturing, transport, utilities, textiles and so on. Further specialisation and honing one's skills is possible through online courses on established e-platforms. These courses help Materials Science professionals keep up with industrial advancement and access industry experts and assignments that provide the opportunity to apply their learning and contribute to economic progress.

The writer is Senior General Manager and Head of the DSIR-approved R&D unit of Industrial Ceramics Division of CUMI, India, and currently leads the R&D programme in Technical and Advanced Ceramics, and Composites.

ON THE SHELF

The Art of Physics

People are messy. Science is methodical. Here are eight hidden, surprising, and sometimes beautiful ways in which Physics can help you make sense of a chaotic and unpredictable world.

Far from being abstract, Physics can help us answer very human questions such as

Why are some relationships unstable, while others last a lifetime?

Why do the rich keep getting richer, and can it ever be any other way?

Why do we all make seemingly irrational decisions?

Drawing on cutting-edge research and insights from quantum mechanics, thermodynamics, chaos and complexity theory, materials science and more, The Art of Physics shows that science offers a rich vocabulary for tackling contradictions that seem to be the hallmarks of daily life. Not only does Physics explain many aspects of our experience, it transforms our understanding of them.

Author: Zahaan Bharmal
Publisher: HarperCollins
Price: ₹499