

EDUCATIONPLUS

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Rakesh M. Krishnan

With its ever-expanding capabilities, Artificial Intelligence (AI) is not just a tool but a force shaping our future. It can write stories, replicate Rembrandt's painting strokes, assist in adjudicating legal cases, aid medical treatment, recommend products, and even recognise human emotions. According to scientists, we are now in the third stage of AI evolution, a phase of deep learning and machine learning due to advancements in digital data and computing power. The third stage captures the transformation from a digital to a datafied society.

In a datafied society, data-based sense-making is central to constructing reality. This means systems processing data resembling intelligent behaviour are vital to our realities. UNESCO broadly defines the latter as the dynamic understanding of AI. The increasing influence of AI and machines in our lifeworld has sparked discussions on the emergence of digital habitus and human-machine interface implicating essential concerns like identities and democracy. These discussions have two main focuses: first, on how algorithms reshape our existence, and second, on the ethical implications of an algorithmic world on the human species. As we navigate this AI-driven future, staying engaged and thoughtful about its impact is crucial.

Pattern creation
AI and other technological innovations are technocratic Utopias created for a manageable present and predictable fu-



Minds, machines, and humanity

Social Sciences and Humanities play a critical role in forging responsible AI

ture. Interestingly, Jonathan Penn, a historian and philosopher of Science, highlighted how rule-following or conformity is the basis of pattern creation of behaviour and mind in AI. Furthermore, pattern identification is crucial for administrative and economic decisions and profit-making exercises. Patterns help in clear identification and engagement; thus, the legibility of human behaviour leads to social domination and control by the owners of technology. At the same time, randomness and unexpectedness of human lives and behaviour are unpredictable and do not follow patterns.

Machine learning aims at actionable predictions indepen-

dent of human inputs. Formal mathematical models of human behaviour and intelligence is at the core of AI's software and algorithms. These models represent a simplified version of the human mind and body that can be calculated and predicted. In essence, creating intelligent machines requires the formal encoding of patterns. The process of identifying and compiling these patterns is influenced by social factors, raising the question of who writes the code and what kind of representative sample is used to extract patterns that caricature the 'human' in machines.

User-centric AI
The cultural context and di-

verse meanings that arise from human interactions are standardised to a specific type. As a result, AI reflects and reproduces the social world of the algorithm developers. The biases and intentions of the algorithm creators underscore the politics of technology and raise ethical questions. Additionally, beyond the intention and language of the software, there are questions about who can access the data generated by the machines and how this data is used beyond the operation of a specific machine. These concerns underscore the importance of responsible AI and the development of user-centric AI, which ensures that data is not misused. Un-

doubtedly, these concerns lead us to the need for responsible AI and the design of user-centric AI, placing a guarantee for the non-misuse of data.

Social Sciences and Humanities (SSH), as fields of knowing the social world and ongoing conversation with human nature, play a critical role in forging responsible AI. A couple of years ago, an interdisciplinary platform in the U.K. brought together social scientists and philosophers to collaborate with data scientists, design specialists, policymakers, and industry to align the social power of AI with the moral and ethical values of human society.

SSH provides insights and enlightening historical per-

spectives on what happens when individuals in a society have reduced communitarian relations, implications of old and new inequalities, identification of incentives and disincentives (construction of ethical order of living) required to maintain social order, and most importantly, how new artefacts can impact the social and political power in a society. Automation technologies reorder the nature-human-machine relationship. However, to what extent should this recasting of relationship happen without displacing human dignity, privacy, accountability, transparency, and fairness? Responsible AI is, in short, a demand for a user-centric AI. SSH provides invaluable cues to these pertinent dimensions of technology-led social change.

The rise of machine agency raises the question of human creativity and innovation, especially for thinking beyond tools and software to fashion human lives. In the impending world of calculable human interactions and predictive behaviour, we must ponder on the role of randomness and contingencies in the human world. Technological breakthroughs, creative thinking, and engineering socio-political Utopias do not follow predictable lines. Resistance to predications animates human agency by rescuing it from being one-dimensional and is the promise for humanity. To sustain these critical aspects of human lives, a continuous conversation with the social world and its creative expressions is needed more than before.

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SCHOLARSHIPS

Nikon Scholarship Programme
An initiative of Nikon India Private Limited
Eligibility: Open to Indian students who have completed Class 12 and are pursuing photography-related courses of minimum three-months duration. Annual family income should be less than ₹600,000.
Rewards: Up to ₹100,000
Application: Online
Deadline: November 30
www.b4s.in/edge/NIKON12

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An initiative from the Yahani Group.
Eligibility: Open to Indian citizens studying in Class 12 who have secured at least 85% in Classes 11 and 12 and have applied for a full-time UG degree at a recognised institution in India. Annual family income of less than ₹150,000 from all sources.
Rewards: Full tuition fees, stipend and other benefits
Application: Online
Deadline: December 1
www.b4s.in/edge/VAHS1

Dr. Gita Piramal Graduate Scholarship
An opportunity offered by Somerville College, Oxford University, the U.K.
Eligibility: Open to Indian nationals currently residing in the country and have applied for a Master's degree in Sustainability Science and Development.
Rewards: Course fees, living and travel expenses
Application: Online
Deadline: January 29, 2025
www.b4s.in/edge/NIKON12

Courtesy: buddy4study.com



OFF THE EDGE
Nandini Raman

I am taking coaching for the CAT and preparing for CMA (U.S.) during my B.Com. Finance. While I would like to do an MBA, getting admission to the IIMs is hard. Private institutions are costly. Should I drop the CAT and prepare for the CMA instead? Muhammed

Dear Muhammed,

It is good that you are considering multiple career paths and evaluating your options. What are your core interests? What is your end goal? If an MBA from IIM or a top business school aligns with your career goals, continue to prepare for the CAT. The preparation is tough but not impossible. You could land up with a wide range of industry choices across management, leadership, entrepreneurship, or consulting roles. If you are more interested in a finance-focused career, then the CMA (U.S.) certification will complement your B.Com degree and lead to roles in management accounting, financial management, and strategy. Research and evaluate the investment of time and money and resources. Speak to professionals or mentors in both fields to get their perspective on existing opportunities and challenges and then decide.

I finished B.Sc (Biotechnology) from Mumbai University and interned in an analytical laboratory for three months but couldn't find a job. I am planning to do my Master's but confused about whether to do M.Sc. in Bioinformatics, Biotechnology, or Analytical Chemistry, or an MBA. People tell me Bioinformatics and Analytical Chemistry are

Research is a must

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

not so relevant. I don't want to invest two more years and still be where I am today. Hamza

Dear Hamza,

This depends on your aspirations, interests, and the job market trends and needs. Consider combining further education with practical experience or certifications that align closely with your career goals. M.Sc. Biotechnology can open up specialised roles in research and development, pharmaceuticals, or biotechnology firms and offers opportunities across biotech companies, research institutions, and clinical labs. M.Sc. Bioinformatics combines Biology, Computer Science, and Data Analysis and can lead to roles in research, academia, or biotech companies that handle large biological datasets. M.Sc. Analytical Chemistry is crucial for laboratories and industries that focus on chemical analysis and quality control and leads to roles related to quality assurance, pharmaceutical analysis, or environmental testing. An MBA is an option if you are interested in management, business development, or entrepreneurship. Also consider industry certifications or short-term courses in data analysis, project management, or specific technical skills. Research and talk to professionals in each field to understand job prospects, industry trends, and the relevance of each degree.

I have completed my BA. LL.B and LL.M in Intellectual Property Law and would like to do a Ph.D. How do I choose a

dissertation topic and select the university? Will it help to take up an Assistant Professorship or join a litigation firm? Bhargavi M.

Dear Bhargavi,

For your dissertation, reflect on the areas of Intellectual Property (IP) Law that you are passionate about. Read recent articles and papers on the topic to identify gaps that need further exploration. Look out for trends and hot topics and discuss your interests with professors or mentors who can guide you. Look at the relevance of the topic and the potential impact on policy-making, industry practices, or legal reforms. Finally, be realistic with the resources, time, and data that you need to complete the Ph.D. To select a university, consider institutions known for research in IP law. Identify potential supervisors whose research interests align with yours. Evaluate the programme structure and funding options, scholarships, or research grants. An assistant professorship will help you engage in research, publish papers, and contribute to academic discourses, teach and mentor students and give access to academic resources, conferences, and a network of professionals. Academia, however, can be competitive, and securing a good position requires a strong publication record and research experience. A litigation firm will offer practical experience and application of your legal knowledge on real-world cases and help build a professional network. It could limit the time you have for research, as the focus will

be on casework and client service.

I am in Class 10 and interested in Law. I want to get into a good law school. Which subjects in Class 11 will help with the CLAT and other law entrance exams? Maria S.

Dear Maria,

Proficiency in English is essential for entrance exams and legal studies, as it will help with comprehension, critical thinking, and essay writing. Improve your reading, vocabulary, understanding and usage of grammar. Legal Studies (if the subject is available) will give you a foundation to understand law, legal principles, case studies, and the legal system. History, Political Science, Economics and basic Maths will also help. Work on developing critical thinking and analytical skills, reading and comprehension, general knowledge, current affairs, essay writing and argumentation, as these are crucial for law exams and legal studies. Study the exam pattern of CLAT and other entrance exams. These usually assess English, general knowledge, legal and logical reasoning, and quantitative techniques. Take practice and mock exams to understand the pattern and improve time management. Join a coaching class if needed. Take part in debates and MUNs to enhance your confidence and public speaking. Look out for internships at legal firms or volunteer work related to social justice to gain practical experience and insights.

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

Usha Iyer

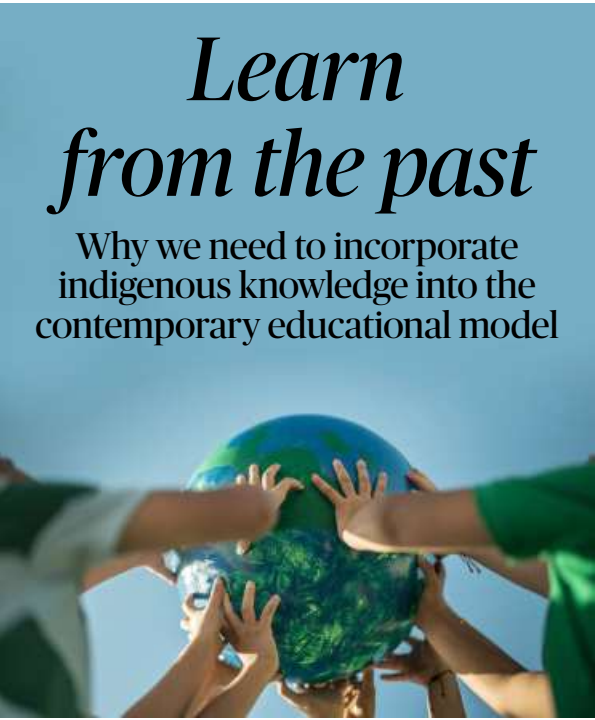
Indigenous knowledge refers to the unique set of understandings, skills, and philosophies developed by local communities through centuries of direct interaction with their environment. Applying these wisdom practices to the concept of SDG methodology can provide profound insights and practical approaches to sustainability.

Traditional indigenous education is inherently connected with the natural world. Learning often takes place outdoors and cultivates a deep appreciation for Nature and encourages students to see themselves as part of a larger ecosystem.

Hands-on projects
Institutions that incorporate outdoor classrooms and hands-on ecological projects can foster a similar sense of stewardship among students. The curriculum can be designed to incorporate various subjects and skills rather than isolating them into rigid categories. For instance, a project on gardening may involve scientific inquiry, artistic expression, and social responsibility, thereby allowing students to engage multiple dimensions of their learning.

Indigenous communities have long practised sustainable living. For instance, many engage in crop rotation, controlled burns, and polyculture farming to enhance soil fertility and prevent depletion of resources. Such practices can be adapted into the curriculum and integrated across multiple subjects. For example, in Science, students can study plant biology and ecological principles; in Maths, they can calculate areas and yields; in Art, they can create signs and promotional materials.

Another aspect is building structures using locally sourced and sustainable materials. By adopting this



Learn from the past

Why we need to incorporate indigenous knowledge into the contemporary educational model

principles, institutions can show students the benefits of supporting local ecosystems and economies. Many cultures utilise techniques such as rainwater harvesting, constructing pits for water retention and check dams to prevent soil erosion. Integrating these into the infrastructure of the buildings can help teach students about water conservation and efficient water management in subjects such as Environmental Science, Geography and Agriculture Studies.

All together
Collective responsibility and community engagement is another characteristic that can be learnt from indigenous communities. For educational institutions, this involves involving students, parents and the local residents in sustainability projects such as building community gardens, tree-planting events, and workshops on recycling and composting. Incorporation of ecological calendars – based on natural cycles, such as the flowering of plants, bird migrations, or the behaviour of specific animals – into educational activities can teach students about

seasonal changes, biodiversity, and the importance of timing in agriculture and conservation efforts and lead to the discussion of critical topics such as climate change, biodiversity, and renewable energy.

Traditional Ecological Knowledge (TEK) includes understanding the relationships between living organisms and their environment. This knowledge can guide modern scientific inquiry and environmental management. By integrating TEK into science curriculums, an interdisciplinary approach that values both traditional wisdom and modern science can be promoted. For instance, in a study of a forest ecosystem, students might learn from indigenous knowledge keepers about the significance of particular trees in local medicine or the role of specific species in sustaining ecological balance.

Respect for nature is a fundamental value and teaching mindfulness and respect for all living things can inspire a generation of environmentally conscious individuals. Activities like nature walks, meditation, and storytelling can instil a sense of

connection for the natural world. Learning move quietly and attentively will help them focus on sensory aspects such as the sound of rustling leaves, the scents of blooming flowers, and the sight of animals in their natural habitats and promote mindfulness. This combination of observation, reflection, and discussion also nurtures a profound respect for all living things.

Zero-waste
Indigenous societies typically practice circular economies, where waste is minimised, and materials are reused or repurposed. Educational institutions can implement zero-waste policies, encourage recycling and upcycling projects, and educate students on the importance of reducing their environmental footprint. A "Waste Audit" is a useful exercise in this regard. Small groups of students can collect and categorise waste generated from classrooms, cafeterias, and other areas and analyse the data gathered to identify common waste items and their potential for reuse. For instance, paper waste could be transformed into recycled art projects or compost.

Indigenous knowledge often includes a deep understanding of local flora and fauna. Schools can celebrate this by preserving native plant species, creating habitats for local wildlife, and teaching students about the cultural significance of these species.

Indigenous knowledge offers a treasure trove of sustainable practices that can be harnessed to create more effective and holistic institutions. By blending traditional wisdom with contemporary educational models, we can cultivate a generation that is deeply connected to and responsible for the health of our planet.

The author is Founder and Director, The Green School Bangalore, Bengaluru



Subjects you do well in

That's simple for subjects you have studied before such as Maths, History, Physics or Economics. But how about Psychology or Accounts or Environmental Science? Get some insights by watching easy primer videos, looking at sample question papers, or even going through an

Subjects you love

Many students say, “I love Maths when I understand it, or practise it well...” The truth is that some subjects take more immersion to make sense of whether you

This is an exploration parents and students should do together, giving each subject a fair shot before you decide what you really enjoy. It also helps to watch simple explainer or

As a thumb rule, if learning a new concept in a subject makes you feel excited and curious to know more, you are likely to find it engaging and immersive through high school. On the other hand, if a class, test or exam in a subject makes you feel stressed, even after preparing your

Career choices should be made keeping in mind your skills, personality and

It also helps to know the necessary and desirable subjects for career paths in the country or system you want to apply to. For instance, Economics usually requires Maths for all countries. The U.S. generally likes to see Math for all courses, Canada is keen on Chemistry for any Engineering or Computer Science course and Maths for Psychology courses, while the U.K. usually demands two Sciences for most STEM areas. Delhi University has, by far, the most stringent subject res-

Work through academic roadblocks: Students often find themselves changing their dream career or aim, because the necessary subjects seem too tough, boring or intimidating. Don't give up so easily. Discuss academic challenges and

*With inputs from Kritika
Malhotra*

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GETTY IMAGES/ISTOCKPHOTO

Radiation oncologist
A radiation oncologist, previously known as a radiotherapist, is a specialised medical professional who creates and manages the treatment for those who undergo radiation therapy. Based on the size, location, and nature of the tumour, radiation oncologists choose the right kind and

Scope

Radiation therapy holds

The writer is President of the Association of Radiation Oncologists of India (AROI) and Former Dean of All India Institute of Medical Sciences (AIIMS), Rishikesh

First let's look at what this treatment is all about. Dialysis functions as an artificial kidney, filtering waste products and excess fluid from the blood when the kidneys are unable to perform these essential functions. There are two primary types: Haemodialysis, which involves filtering a patient's blood through a dialyser, an artificial kidney machine, and peritoneal dialysis, in which a cleansing fluid (dialysate) is introduced

FREEPIK

Curricular integration

However, the concept of field work needs to be seamlessly incorporated into the curriculum. This will ensure that field ex-

experience. Harnessing tools and technologies like drones, GPS devices and mobile applications can enable data gathering, evaluation and re-

The writer is Dean, School of Agricultural Sciences, G.D. Goenka University.

These courses are pathways to careers as dialysis technician or supervisor; dialysis nurse and offer roles in nephrology clinics, hospitals, dialysis centres, and R&D. Beyond this, successful dialysis specialists require a comprehensive skill set including: in-depth understanding of kidney anatomy, physiology, and pathology, proficiency in dialysis equipment operation and

For those passionate about a career in health-care and making a positive impact, this offers a rewarding career.

The writer is Founder and Managing Director of Target Publications Pvt Ltd.

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B.Sc. Dialysis Technology: A three-year course that provides a comprehensive foundation in chronic kidney disease,