

21st Edition of India-Japan Fest

BICON-2026

ARTIFICIAL INTELLIGENCE FOR SMART AND RESILIENT SOCIETIES

September 20-23, 2026 | Jaipur, Rajasthan, India

ISBN: 978-93-83343-60-7

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BIYANI GROUP OF COLLEGES

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Sector No. 3, Vidhyadhar Nagar, Jaipur, Rajasthan (India)





Feel the Power of Excellence in Education





21st Edition of India-Japan Fest

BICON-2026

ARTIFICIAL INTELLIGENCE FOR SMART AND RESILIENT SOCIETIES

Day-1 : Sept. 20, 2026 (Sun.)

Study in Japan: Exploring Higher Education & Career Opportunities

Discipline: High School Students

Day-2 : Sept. 21, 2026 (Mon.)

The Future of Intelligent Healthcare and Scientific Innovation

Discipline: Science, Nursing & Pharmacy, Naturopathy & Yogic Sciences

Day-3 : Sept. 22, 2026 (Tue.)

Building the AI-Powered Economy: Innovation, Strategy, and Governance

Discipline: Commerce, Management and IT

Day-4 : Sept. 23, 2026 (Wed.)

Intelligent Societies: AI Transforming Social Systems, Human Development & Education

Discipline: Social Sciences & Education

The Future of Law & Governance in the Age of Artificial Intelligence

Discipline: Law

Proceeding of the Conference

ISBN: 978-93-83343-60-7



Organized by:
BIYANI GROUP OF COLLEGES
Jaipur, India

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ISBN: 978-93-83343-60-7

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Published by

Biyani Institute of Commerce & Management LLP

Jaipur (India)

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| • Mr. Nilesh Sharma | • Mr. Vikram Sharma |
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Welcome to the India-Japan Fest in the Pink City of India!

Welcome to the 21st Biyani International Conference (BICON-2026) — a celebration of knowledge, innovation, and India–Japan friendship in the Gulabi Nagari of India.

It gives us immense pleasure to welcome you to the 21st edition of the Biyani International Conference, being held from 20–23 September 2026 under the theme *Artificial Intelligence for Smart and Resilient Societies*.

Over the past two decades, BICON has evolved into a vibrant platform bringing together students, researchers, academicians, industry professionals, policymakers, and international partners. This year, we explore Artificial Intelligence not merely as a technological advancement, but as a force that can contribute to smarter, more inclusive, sustainable, adaptable, and resilient societies.

Through research presentations, expert sessions, panel discussions, and interdisciplinary interactions, BICON-2026 will explore the applications of AI across education, healthcare, business, science, law, social development, and the future of work.

This year, we are honoured to welcome distinguished *Japanese delegates, students, academicians, industry representatives, and experts*, further strengthening the enduring academic and cultural relationship between India and Japan.

Highlights of BICON-2026

India–Japan Academic and Cultural Exchange: This edition continues our commitment to strengthening India–Japan relations through academic collaboration, student exchange, cultural interaction, and opportunities for future partnerships.

GULABI 2026: The *GULABI – Global Unity through Learning Art (Language & Culture) with Biyani* programme brings together Japanese university students and Biyani students for a 12-day immersive exchange involving language learning, cultural experiences, academic interaction, and community engagement.

High School Seminar – Study in Japan: The special seminar *Study in Japan: Exploring Higher Education & Career Opportunities* will provide students and parents with insights into higher education pathways and career opportunities in Japan. We are grateful to the *Education Committee of the Maheshwari Samaj (ECMS)*, Jaipur and *Maheshwari Public School, Jawahar Nagar (MPS)* for associating with us in this initiative and extending the India–Japan connect to the school community.

HR Conclave 2026: The *HR Conclave*, themed *Future Skills & Workforce Readiness in the AI Era*, will bring together HR professionals, industry leaders, academicians, and experts to discuss emerging skills, employability, and preparing young professionals for an AI-driven world.

Institutional Partnerships: BICON-2026 will also mark an important step towards long-term institutional collaborations, with MoUs being formalised with leading partner institutes. These partnerships aim to create opportunities for academic engagement, student development, knowledge exchange, and future collaboration.

Research and Knowledge Exchange: With research presentations, invited talks, panel discussions, and interdisciplinary sessions, BICON-2026 provides a platform for sharing ideas, meaningful dialogue, and collaboration. The conference is expected to bring together *5,000+ student participants and 80+ speakers*.

We are deeply honoured by the support and participation of distinguished dignitaries, academicians, industry leaders, international delegates, and our valued partners. Their presence reinforces our shared commitment to building stronger bridges between education, industry, technology, and society.

A conference of this scale is possible only through collective effort. We place on record our heartfelt appreciation for our key coordinators — *Dr. Dhyan Singh Gothwal, Dr. Shilpa Bhargava, Dr. Smriti Tiwari, Mr. Virender Kumar, and Dr. Vishnu Sharma* — whose commitment and coordination have been instrumental in bringing BICON-2026 together. We also extend our special appreciation to *Mr. Nilesh Sharma* for his creativity and dedication in designing the conference materials and visual elements.

Our sincere thanks also go to the *day conveners, session chairs, moderators, faculty coordinators, student volunteers, technical and administrative teams*, and every member of the BICON family whose contribution has made this conference possible.

We extend our gratitude to all our *Japanese and Indian partners, speakers, researchers, delegates, industry representatives, HR professionals, students, and institutions* for being an integral part of BICON-2026.

As we enter the 21st year of BICON, our vision remains clear: to create spaces where knowledge meets opportunity, cultures meet with mutual respect, and young minds are encouraged to think beyond boundaries.

May BICON-2026 inspire meaningful conversations, innovative ideas, lasting partnerships, and empower our students to contribute to a smarter, more inclusive, and resilient future.

On behalf of the entire BICON team, we warmly welcome you to BICON-2026 and wish you an enriching, inspiring, and memorable experience.

Together, we advance knowledge.

Together, we inspire innovation.

Together, we shape a smarter future.

With warmest regards,



Dr. Manish Biyani

Organizing Chair

- Director (Research & Development),
Biyani Group of Colleges, India
- Professor, Kwansei Gakuin University, Japan



Dr. Radhika Biyani Daga

Conference Convener

- Assistant Director (Research,
Development & Global Affairs)
Biyani Group of Colleges, India



Dr. Dhyan Singh Gothwal

Conference Co-Convener

- Principal, Biyani Girls College, India

हरिभाऊ बागडे
राज्यपाल, राजस्थान



Haribhau Bagde
Governor, Rajasthan



दिनांक : सितम्बर, 2026

संदेश

मुझे यह जानकर प्रसन्नता हुई है कि बियानी गर्ल्स कॉलेज द्वारा 21 वीं भारत-जापान 'बायोकॉन-2026' कॉफ्रेंस का आयोजन 20 से 23 सितम्बर तक किया जा रहा है। इस बार यह कॉफ्रेंस कृत्रिम बुद्धिमत्ता के आलोक में समाज को सामाजिक संदर्भों में गढ़ने के विषय पर आयोजित हो रही है।

भारत-जापान समन्वय के अन्तर्गत यहां की छात्राओं को उद्यमिता अनुकूल बनाने की दृष्टि से बायोकॉन का आयोजन महती है। मैं पिछली बार भी इस कॉफ्रेंस में आया था, और अनुभव किया कि दोनों देशों के परस्पर समन्वय से छात्राओं का कौशल विकास, आत्मनिर्भर निर्माण में यह महती है। छात्राएं यदि आगे बढ़ती हैं तभी समाज भी तेजी से विकास की ओर अग्रसर होगा।

इस आयोजन की सफलता के लिए मेरी हार्दिक शुभकामनाएं हैं।

(हरिभाऊ बागडे)

लोक भवन, सिविल लाइन्स, जयपुर-302006
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Dr. Prem Chand Bairwa
Deputy Chief Minister
Government of Rajasthan



Technical Education, Higher Education,
Ayurveda, Yoga & Naturopathy, Unani,
Siddha & Homeopathy (Ayush),
Transport & Road Safety Department



Date-12-09-2026

MESSAGE

I am delighted to be invited to the 21st India-Japan Bilateral Conference (BICON-2026), being organized by the prestigious Biyani Group of Colleges, Jaipur, from 20th to 23rd September 2026.

With the theme “**Artificial Intelligence for Smart and Resilient Societies**” the conference will provide a meaningful platform for **interaction, knowledge exchange and collaboration** between India and Japan.

Deliberations by eminent experts on the transformative role of Artificial Intelligence in healthcare, science, economy, education, social development, law and governance will inspire innovative thinking and contribute towards building a smarter and more resilient future.

I wish the conference grand success.

(Dr. Prem Chand Bairwa)

Office : 4125, Main Building, Government Secretariat, Jaipur-302005
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अशोक गहलोत

पूर्व मुख्य मंत्री, राजस्थान



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दूरभाष : 0141-2229244

0141-2229255

No. PS/

Jaipur, Sept. 13, 2026

Message

I am delighted to learn about the initiative taken by the Biyani Group of Colleges, Jaipur, to organize the 21st India–Japan Bilateral Conference (BICON 2026), to be held from 20 to 23 September 2026.

The theme of the conference, “Artificial Intelligence for Smart and Resilient Societies,” is both timely and significant. India and Japan share a strong relationship in the fields of education, technology, research, and industry. The responsible application of artificial intelligence can further strengthen this partnership while helping to address emerging societal and economic challenges.

I am confident that the conference will provide an excellent forum for India and Japan to explore innovative models of academic, scientific, and industrial collaboration and to discuss AI-driven solutions for a sustainable and resilient future.

I wish the conference every success.

(Ashok Gehlot)

Dr. Dhyan Singh Gothwal

Conference Co-convener

Principal, Biyani Girls College,

R-4, Sector 3, Vidyadhar Nagar, Jaipur

पानी बचाओ - बिजली बचाओ - सबको पढ़ाओ - बेटी बचाओ - वृक्ष लगाओ

टीकाराम जूली

नेता प्रतिपक्ष



कमरा नं. 131-132,
राजस्थान विधान सभा, जयपुर
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क्रमांक: नेप्र/राविस/2026/ 403

दिनांक: 15/09/2026

Dr. Dhyani Singh Gothwal,

I extend my warm greetings to the organisers, delegates from India and Japan, academicians, researchers, faculty and students gathered for BICON-2026 at Biyani Girls College, Jaipur.

For over two decades, this conference has contributed to the strengthening of academic and cultural ties between the two great asian nations. The theme of this edition rightly reminds us that Artificial Intelligence must serve society - by expanding opportunity for youth, especially young women, by strengthening public systems, and by making our communities more resilient.

I commend Biyani Group of Colleges for placing girls' education at the heart of this international platform. I wish BICON-2026 every success and look forward to ideas that travel from this gathering to classrooms, laboratories and the lives of ordinary citizens.

With warm regards,

(Tikaram Jolly)

Dr. Dhyani Singh Gothwal

Dean & Principal

R-4, Sector-3, Vidhyadhar Nagar,

Jaipur - 302039, Rajasthan.

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बांदीकुई, जिला-दौसा



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दिनांक - 17-09-26



MESSAGE

I am happy to know that Biyani Group of Colleges, Jaipur, is organizing the 21st India-Japan Bilateral Conference (BICON-2026) from 20th to 23rd September 2026 with the theme "Artificial Intelligence for Smart and Resilient Societies."

I am optimistic that the conference will provide a dynamic platform for discussions on AI-enabled healthcare and scientific innovation, the AI-powered economy, education and human development, social systems, law and governance. Such interdisciplinary dialogue can contribute significantly to building inclusive, sustainable and resilient societies.

I wish the 21st India-Japan Bilateral Conference (BICON-2026) great success.

भागचन्द सैनी

Bhagchand Saini Tankda

झालानी बगीची के आगे, बडियाल रोड, बांदीकुई, दौसा -303313

नवीन जैन, आई.ए.एस.
Naveen Jain, I.A.S.



Principal Secretary to Government
GAD, Cabinet, Estate, Motor Garage
Civil Aviation & Ex-Officio
Chief of Protocol & Director General
Civil Aviation, Rajasthan Jaipur

MESSAGE

I am delighted to be invited to the 21st India-Japan Bilateral Conference (BICON-2026), being organized by the prestigious Biyani Group of Colleges, Jaipur from 20th to 23rd September 2026.

The theme of the conference, “Artificial Intelligence for Smart and Resilient Societies” highlights the transformative potential of AI across diverse sectors. The conference will provide a valuable platform for discussions on intelligent healthcare and scientific innovation, AI-driven economic growth, education and human development, social systems, law and governance. It will also enable academicians, industrialists, scientists and research scholars from India and Japan to exchange expertise, explore new strategies and strengthen international collaboration.

I extend my best wishes for the success of BICON-2026.[!]



(Naveen Jain)

Room No. 1036, Ground Floor, Main Building, Secretariat, Jaipur - 302005
Phone : 2227103 | Email : psgad@rajasthan.gov.in

कुलदीप रांका
आई.ए.एस.
Kuldeep Ranka
I.A.S.



अतिरिक्त मुख्य सचिव
उच्च एवं तकनीकी शिक्षा विभाग
राजस्थान सरकार
Additional Chief Secretary
Higher & Technical Education Department
Government of Rajasthan



Message

It gives me immense pleasure to be associated with the **21st India–Japan Bilateral Conference (BICON-2026)**, being organized by **Biyani Group of Colleges, Jaipur**, from **20th to 23rd September 2026**.

The conference theme, “**Artificial Intelligence for Smart and Resilient Societies**,” reflects the growing significance of emerging technologies in shaping the future of our societies. At a time when Artificial Intelligence is transforming diverse sectors, such initiatives provide an important forum for sharing perspectives, exploring new possibilities and fostering meaningful dialogue.

BICON-2026 will bring together distinguished academicians, researchers, industry professionals, students and delegates from **India and Japan**, further strengthening the spirit of academic exchange and bilateral cooperation. I am confident that the discussions and interactions during the conference will generate valuable insights, encourage innovation and contribute towards responsible and sustainable progress.

I congratulate **Biyani Group of Colleges** for organizing this significant international conference and convey my sincere best wishes for the successful conduct of **BICON-2026**.

Kuldeep Ranka

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DR. BHIMRAO AMBEDKAR LAW UNIVERSITY, JAIPUR
[A State Funded University of Rajasthan, Established by an Act No. 06 of 2019]

Professor (Dr.) Nishtha Jaswal
(LL.M., Ph.D.)
Vice-Chancellor



No.VCS/ALU/2026/
Date: 16/09/2026

MESSAGE

I am delighted to be invited to the 21st India–Japan Bilateral Conference (BICON-2026), being organised by the Biyani Group of Colleges, Jaipur, from 20th to 23rd September 2026, on the theme “Artificial Intelligence for Smart and Resilient Societies.”

I am confident that this significant conference will provide a meaningful platform for interdisciplinary dialogue and exchange of ideas on the responsible, ethical and innovative use of Artificial Intelligence across diverse fields, including healthcare, science, economy, education, social development, law and governance.

The coming together of experts and scholars from India and Japan will provide valuable opportunities to share experiences, explore emerging possibilities and address the challenges accompanying the rapid advancement of AI. Such collaborative engagement can contribute significantly towards building smarter, more inclusive, sustainable and resilient societies, while ensuring that technological progress remains firmly rooted in human values and social well-being.

I extend my warmest wishes to the organisers, participants and delegates for the success of BICON-2026 and for fruitful deliberations that may contribute to shaping a responsible and human-centred future with Artificial Intelligence.


Prof. (Dr.) Nishtha Jaswal

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Prof. (Dr.) Pramod Yeole
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No.: F.()P.A./VC Sectt./2025/173

Date: 18/09/2026

MESSAGE



It gives me immense pleasure to be associated with the **21st India–Japan Bilateral Conference (BICON-2026)**, being organized by **Biyani Group of Colleges, Jaipur**, from **20th to 23rd September 2026**.

The conference theme, “**Artificial Intelligence for Smart and Resilient Societies**,” reflects the growing significance of emerging technologies in shaping the future of our societies. At a time when Artificial Intelligence is transforming diverse sectors, such initiatives provide an important forum for sharing perspectives, exploring new possibilities and fostering meaningful dialogue.

BICON-2026 will bring together distinguished academicians, researchers, industry professionals, students and delegates from **India and Japan**, further strengthening the spirit of academic exchange and bilateral cooperation. I am confident that the discussions and interactions during the conference will generate valuable insights, encourage innovation and contribute towards **responsible and sustainable progress**.

I congratulate **Biyani Group of Colleges** for organizing this significant international conference and convey my sincere best wishes for the successful conduct of **BICON-2026**.

Prof. (Dr.) Pramod Yeole
Vice Chancellor
Rajasthan University of Health Sciences,
Jaipur

The Education Committee of The Maheshwari Samaj (Society), Jaipur

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Umesh Soni

President

9829059157

**Kamal Somani**

General Secretary Education

9829069497

18.09.2026

Message

I am delighted to learn about the initiative undertaken by the Biyani Group of Colleges, Jaipur, to organize the 21st India–Japan Bilateral Conference (BICON 2026), scheduled to be held from 20–23 September 2026.

The theme of the conference, “Artificial Intelligence for Smart and Resilient Societies,” is highly relevant and timely in the context of rapid technological transformation. India and Japan share a longstanding and strong partnership in education, science, technology, research, and industry. The responsible and innovative application of artificial intelligence can further deepen this partnership and contribute to addressing emerging societal and economic challenges.

I am confident that BICON 2026 will provide a meaningful platform for researchers, academicians, industry leaders, and policymakers from India and Japan to exchange knowledge, explore innovative approaches, and foster new avenues for academic, scientific, and industrial collaboration.

I wish the 21st India–Japan Bilateral Conference great success and hope that its deliberations will contribute to building a more sustainable, inclusive, smart, and resilient future.

Regards,

Kamal Somani

General Secretary Education



FROM THE CONVENER'S DESK

It gives our great pleasure to extend to you all a warm welcome on behalf of all Departments, Biyani Group of Colleges, Jaipur. We are grateful to all the speakers, delegates, organizers and guests, who have accepted our invitation to participate in the BICON 2026.

It is with immense joy and pride that we extend a heartfelt welcome to each one of you on behalf of all the Departments of the Biyani Group of Colleges, Jaipur. We are truly grateful to the distinguished speakers, delegates, organizers, and guests who have so graciously accepted our invitation to participate in BICON 2026.

This conference presents a wonderful opportunity to renew connections, exchange ideas, and explore avenues of mutual interest with colleagues from both Japan and India.

We are delighted to see that the agenda embraces a rich spectrum of thought-provoking themes, reflecting the ever-evolving frontiers of higher education in our two nations and the exciting prospects that lie ahead.

The success of this event is a testament to the sincerity, commitment, and tireless efforts of our management, faculty, staff, and students. Their dedication has made this gathering possible, and we trust their hard work will shine through in every moment of your experience here. We sincerely hope that your time at BICON 2026 proves insightful, enriching, and memorable, leaving a lasting impact well beyond the close of the event.

Once again, we extend our warmest welcome and best wishes for a rewarding participation.



Dr. Shilpa Bhargava
(Dept. of Science)
Convener, Day-2



Dr. Jishu B. George
(Dept. of Nursing)
Convener, Day-2



Dr. Rambir Singh
(Dept. of Pharmacy)
Convener, Day-2



Dr. Priyanka Gupta
(Dept. of Commerce &
Management)
Convener, Day-3



Mr. Sachin Bagoriya
(Dept. of IT)
Convener, Day-3



Dr. Sonam Ratnu
(Dept. of Law)
Convener, Day-4



Mr. Virendra Kumar
(Dept. of Humanities)
Convener, Day-4



Dr. Shipra Gupta
(Dept. of Education)
Convener, Day-4

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- Mr. Nilesh Sharma

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| • Ms. Rumana Ali | • Ms. Sheela Kumari | • Mr. Sushil Kumar Agarwal |
| • Mr. Ramesh Kumar Verma | • Mr. Ashok Sharma | • Dr. Tulika Anthwal |
| • Ms. Kavita Bhatt | • Ms. Pooja Rani | • Ms. Himani Rana |
| • Ms. Prachi | • Mr. Manish Yadav | • Ms. Akriti Dubey |
| • Mr. Nitin Shukla | • Ms. Urvashi | • Ms. Meecal Nobel |
| • Ms. Priya Chauhan | | |

ORGANIZING COMMITTEE (Date : 22 Sept., 2026)

- | | | |
|------------------------|--------------------------|------------------------|
| • Dr. Ritu Sharma | • Dr. Surbhi Mittal | • Ms. Sonal Verma |
| • Ms. Shweta Nirwan | • Ms. Anushka Kumawat | • Ms. Apeksha Agarwal |
| • Mr. Rahul Agrawal | • Mr. Pankaj Kumar Gupta | • Ms. Shabna Ali |
| • Ms. Preeti Bansal | • Ms. Himanshi Kumawat | • Ms. Ritika Soni |
| • Ms. Sadaf Khan | • Ms. Harshita Ojha | • Ms. Abha Bhandari |
| • Ms. Reema Chaudhary | • Ms. Monika Chaudhary | • Ms. Noshika Chandela |
| • Mr. Mohammed Rafiq | • Mr. Madan Lal Bajiya | • Mr. Sikander Tank |
| • Mr. Jhabar Mal Saini | | |

ORGANIZING COMMITTEE (Date : 23 Sept., 2026)

- | | | |
|---------------------------|--------------------------|------------------------|
| • Dr. Arti Gupta | • Dr. Bharti Sharma | • Dr. Tripti Saini |
| • Dr. Sunita Ku. Sharma | • Dr. Sunita Sharma | • Dr. Meenakshi Sharma |
| • Dr. Mukesh Ku Yadav | • Ms. Malti Saxena | • Ms. Sarita Pareek |
| • Ms. Sarita Sharma | • Ms. Pushpa Kumawat | • Ms. Vinita Sharma |
| • Ms. Priyanka Sharma | • Ms. Purva Gautam | • Dr. Shiv Jhalani |
| • Ms. Sarika Gupta | • Ms. Shaifali Vijay | • Ms. Sonia Sharma |
| • Ms. Kanishka Joshi | • Ms. Himanshi Sethi | • Ms. Surbhi Bakoliya |
| • Ms. Arti | • Ms. Tanushka Paliwal | • Dr. Madhuri Sharma |
| • Dr. Kusum Saini | • Dr. Vijay Kanwar | • Dr. Babita Choudhary |
| • Ms. Hemangini Shekhawat | • Ms. Anu Jangir | • Ms. Priyanshi Dhaka |
| • Ms. Chanchal Meena | • Mr. Abhishek Sinsinwar | • Mr. Preyas Haldar |
| • Ms. Anushka Sharma | • Ms. Arunika Kumawat | • Mr. Aditya Sharma |
| • Mr. Surendra Mathur | • Mr. Dinesh Prajapat | • Mr. Madhusudan Nagar |
| • Mr. Sandeep Tomar | | |

PROGRAMME AT A GLANCE**DAY 2: September 21, 2026 (Monday)*****Theme: The Future of Intelligent Healthcare and Scientific Innovation***

Time (IST)	Schedule
08:00 AM – 08:30 AM	Registration
08:30 AM – 09:00 AM	Flag Hoisting Ceremony
Inaugural Session (09:10 AM – 11:10 AM) Moderator : Ms. Kanchan Sharma, Asst. Prof., Biyani Girls College, Jaipur, INDIA	
09:10 AM - 09:20 AM	Introduction of BICON-2026: 21 th Anniversary Edition Glimpses
09:20 AM - 09:25 AM	Lighting of the Lamp
09:25 AM - 09:30 AM	Saraswati Vandana
09:30 AM - 09:50 AM	Welcome of Guests, Speakers and Japanese Delegates
09:50 AM - 10:00 AM	Welcome address by Organizing Chair BICON-2026 Prof. Manish BIYANI Director (Research & Development) Biyani Group of Colleges, INDIA
10:00 AM - 10:10 AM	Inaugural Address by Chief Guest IAS Shri Aakash TOMAR Executive Director at Rajasthan State Industrial Development and Investment Corporation (RIICO), Jaipur, INDIA
10:10 AM - 10:20 AM	Address by Special Guest Mr. Yasuyuki NAKAYAMA First Secretary, Embassy of Japan in India, INDIA
10:20 AM - 10:40 AM	Keynote Speaker (Online) Prof. Hidetoshi SATO Department of Biomedical Chemistry, Kwansei Gakuin University, JAPAN
10:40 AM – 10:50 AM	BICON-2026 Souvenir Release Ceremony
10:50 AM – 11:05 AM	Gulabi 2026 : Experience Sharing by Japanese Participants
11:05 AM – 11:10 AM	Vote of Thanks Dr. Sanjay BIYANI, Director (Acad.), Biyani Group of Colleges, Jaipur, INDIA
11:10 AM – 11:40 AM	High Tea

Invited Lectures (12:00 PM – 04:10 PM) Session Moderator: Ms. Kanchan Sharma, Assistant Professor, Biyani Girls College, Jaipur	
12:00 PM – 12:20 PM	IL-1, Prof. Yasunori BABA Asso. professor, Research Institute For Bioresources and Biotechnology, Ishikawa Prefectural University, JAPAN
12:20 PM – 12:40 PM	IL-2, Prof. Ikuko YAO Professor, Department of Biomedical Sciences, School of Biological and Environmental Sciences, Kwansei Gakuin University, JAPAN
12:40 PM – 01:00 PM	IL-3, Dr. (Mrs.) Rati BALACHANDRAN Professor, Dr. Ram Manohar Lohia Hospital College of Nursing, Delhi INDIA, (Govt. of India Ministry Of Health and Family Welfare)
01:00 PM – 01:20 PM	IL-4, Prof. Dhinakaran SHANMUG Professor, Department of Mechanical Engineering, IIT Indore, INDIA
01:20 PM – 01:40 PM	IL- 5, Prof. Gazala HABIB Department of Civil & Environment Engineering, IIT Delhi, INDIA
01:40 PM – 02:00 PM	IL-6, Prof. Amit Kumar GOYAL Professor, Central University, Ajmer, Rajasthan, INDIA
02:00 PM – 03:00 PM	Poster Presentation – Venue: A-104 & Lunch Break
03:10 PM – 03:25 PM	IL- 7, Dr. Sumit KALRA Associate Professor, Department of Computer Science & Engineering Indian Institute of Technology Jodhpur, INDIA
03:25 PM – 03:40 PM	IL-8, Prof. Junseok LEE Professor Doc Researcher, Research Institute For Bioresources and Biotechnology, Ishikawa Prefectural University, JAPAN
03:40 PM – 03:55 PM	IL-9, Dr. Jimmy KARLOOPIA Assistant Professor, Production and Industrial Engineering Department, Punjab Engineering College (Deemed to be University), Chandigarh, INDIA
03:55 PM – 04:10 PM	IL-10, Mr. Vivek PRAKASH Senior Vice President & Head, CSR, Bharat Impact, Jubilant Ingrevia Ltd
04:10 PM – 04:15 PM	Vote of Thanks & Group Photo Dr. Dhyan Singh GOTHWAL , Principal, Biyani Girls College, Jaipur, INDIA

Industrial Session & HR Conclave (04:15 PM – 05:20 PM) Session Moderator : Ms. Kanchan Sharma, Asst. Prof., Biyani Girls College, Jaipur, INDIA	
04:15 PM – 05:45 PM	Human Resource (HR) Conclave and Industry Panel Discussion Chair: Dr. Smriti Tiwari, Training & Placement Head Biyani Girls College, Jaipur Panellists Representing: <i>Mr. Balwinder Waliya (Narayana Health), Ms. Kato Tomoko (Naitei Bridge Co., Ltd., JAPAN), Mr. Vivek Chadha (Startupology), Mr. Sujinder (Jublyn), Mr. Nitin Gupta (Genenest Biotech), Ms. Shilpi Mishra (Infinita Biotech), Mr. Arvind Sankar (BASF), Ms. Sheenu Jhanwar (Apex Hospital)</i>
04:15 PM – 05:30 PM	Oral Presentation Venue: Manthan, Conference Hall (10 min. to each paper with Q & A) Dr. Vishnu Sharma (Research Head, Biyani Girls College, Jaipur)
05:45 PM – 05:50 PM	Award Ceremony, Memento Distribution and Group Photo
05:50 PM – 06:00 PM	Vote of Thanks Dr. Radhika Biyani Daga Convener, BICON 2026, Assistant Director – Research, Development & Global Affairs, Biyani Group of Colleges, Jaipur, INDIA
06:00 PM Onwards	High- Tea

PROGRAMME AT A GLANCE**DAY 3: September 22, 2026 (Tuesday)*****Theme:** Building the AI Powered Economy: Innovation, Strategy and Governance*

Time (IST)	Schedule
08:30 AM-09:00 AM	Registration
Inaugural Session, (09:10 AM-11:10 AM) Moderator: Dr. Priyanka Gupta HOD of Commerce & Management, Biyani Girls College, Jaipur, INDIA	
09:10 AM - 09:15 AM	Introduction of BICON-2026: 21 th Anniversary Edition Glimpses
09:15 AM - 09:20 AM	Lighting of the Lamp
09:20 AM - 09:25 AM	Krishna Vandana
09:25 AM - 09:35 AM	Welcome of Guests, Speakers and Japanese Delegates
09:35 AM – 09:45 AM	Welcome address by Organizing Chair BICON-2026 Prof. Manish BIYANI Director (Research & Development) Biyani Group of Colleges, INDIA
09:45 AM – 9:55 AM	Inaugural Address by Special Guest Dr. Dhaneshwar Sharma Director, Jaipuria Institute of Management, Jaipur, INDIA
09:55 AM – 10:15 AM	Keynote Speaker (Online) Prof. Krishna Kant DAVE Group Vice-Chancellor Shri Venkateshwara University, Uttar Pradesh, INDIA
10:15 AM – 10:30 AM	Introduction of Osaka Convention & Tourism Bureau, JAPAN by Mr. Kyou & Mr. Naveen
10:30 AM – 10:40 AM	MOU Signing Ceremony (Osaka Convention & Tourism Bureau, Japan & Biyani Girls College)
10:40 AM – 10:50 AM	Gulabi 2026 : Experience Sharing by Japanese Participants
10:50 AM- 11:00 AM	Vote of Thanks Dr. Sanjay BIYANI Director (Acad.), Biyani Group of Colleges, Jaipur, INDIA
11:00 AM- 11:10 AM	Group Photo & Memento Distribution
11:10 AM-11:40 AM	High Tea with Snacks

Invited Technical Session, (12:00 PM - 01:30 PM)	
Moderator: Ms. Sadaf Khan, Assistant Professor, Department of IT, Biyani Girls College, Jaipur	
12:00 PM – 12:20 PM	IL- 1, Mr. Nimay Kalyani Campus Director University of Wollongong (UOW) India, GIFT City, Gujarat, INDIA
12:20 PM – 12:40 PM	IL- 2, Vaishali Jayesh Padake Assistant Professor (S.G.), Department of Economics K J Somaiya Institute of Management, Mumbai, INDIA
12:40 PM – 01:00 PM	IL- 3, Dr. Pratistha Mathur Professor & Head, Department of Information & Technology Manipal University, Jaipur, INDIA
01:00 PM – 01:20 PM	IL- 4, Dr. Ritu Bhargava Associate Professor, Department of Computer Science Sophia College (Autonomous), Ajmer, INDIA
01:20 PM - 01:40 PM	IL- 5, Ms. Uma Sudhindra Chairperson & Board of Advisor, Strategic Research & Growth Foundation New Delhi, INDIA
01:40 PM - 01:45 PM	Vote of Thanks & Group Photo CA Sakshi BIYANI Assistant Director, Biyani Group of Colleges, Jaipur, INDIA
01:45 PM - 02:45 PM	Lunch Break
Human Resource (HR) Conclave and Panel Discussion (02:50 PM – 04:20 PM)	
Chair: Dr. Smriti Tiwari, Training & Placement Head	
02:50 PM - 04:20 PM	<i>Panelist(s) :Mr. Naveen Maheshwari (Zonal Head, HDFC Rajasthan), Ms. Uma Sudhindra (Strategic Research & Growth Foundation, Delhi), Ms. Bobby (HR Head, Metacube), Ms. Gunia Khurana (HR head, Wonder Home finance)</i>
04:20 PM - 05:20 PM	Oral Presentations Young Oral Presentations (10 min. to each paper with Q & A) Chair: Dr. Pawan Patodiya & Mr. Rahul Agarwal
05:20 PM - 05:30 PM	Award Ceremony for Oral Presentation Group Photo& Memento Distribution
05:30 PM - 05:40 PM	Closing Remarks & Vote of Thanks
05:40 PM Onwards	High Tea

PROGRAMME AT A GLANCE**DAY 4(FIRST HALF): September 23, 2026 (Wednesday)*****Theme:** Intelligent Societies: AI Transforming Social Systems,
Human Development, and Education*

Time (IST)	Schedule
08:30 AM - 09:00 AM	Registration
Inaugural Session (09:10 AM – 11:00 AM) Chair: Dr. Bharti Sharma, Asst. Professor, Biyani Girls B.Ed. College	
09:10 AM - 09:15 AM	Introduction of BICON-2026: 21 th Anniversary Edition Glimpses
09:15 AM - 09:20 AM	Lighting of Lamp
09:20 AM - 09:25 AM	Ganesh Vandana
09:25 AM - 09:35 AM	Welcome of Guests and Speakers
09:35 AM - 09:45 AM	Welcome Address by Organizing Host BICON-2026 Dr. Sanjay BIYANI Director (Acad.), Biyani Group of Colleges, Jaipur, INDIA
09:45 AM - 09:55 AM	Inaugural Address by Special Guest
09:55 AM - 10:15 AM	Gulabi 2026 : Experience Sharing by Japanese Participants
10:15 AM - 10:20 AM	Vote of Thanks Dr. Shipra GUPTA Principal, Biyani Girls B.Ed. College, Jaipur, INDIA
10:20 AM - 10:25 AM	Group Photo & Memento Distribution
10:25 AM - 11:00 AM	High Tea with Snacks
Invited Technical Session : (11:10 AM – 01:00 PM) Chair: Dr. Bharti Sharma, Asst. Professor, Biyani Girls B.Ed. College	
11:10 AM - 11:30 AM	IL-1, Prof. Dinesh CHAHAL Professor, Department of Teacher Education, Central University of Haryana, Pali, INDIA
11:30 AM - 11:50 AM	IL-2, Prof. Ajay SURANA Professor & Head, Department of Education Banasthali Vidyapith, Rajasthan, INDIA
11:50 AM - 12:10 PM	IL-3, Prof. (Dr.) Inderjeet Singh SODHI Professor (Public Administration), Department of Political Science Faculty of Social Sciences, Jamia Millia Islamia, New Delhi, INDIA

12:10 PM - 12:30 PM	IL-4, Dr. Chander Kanwar PALAWAT Nodel Officer, flagship Scheme, Swami Vivekanand Scholarship – Academic Excellence, Shiksha Sankul, Jaipur, INDIA
12:30 PM - 12:40 PM	Oral Presentation (10 min. to each paper with Q & A) Chair : Ms. Malti Saxsena, Assistant Professor, Biyani B.Ed. Girls College, Jaipur
12:40 PM - 12:45 PM	Closing Remark & Vote of Thanks Mr. Virender KUMAR Principal, BCSM, Kalwar, Jaipur, INDIA

DAY 4(SECOND HALF): September 23, 2026 (Wednesday)*Theme: The Future of Law & Governance in the Age of Artificial Intelligence*

Time (IST)	Schedule
01:00 PM – 01:20 PM	Registration
Session Opening of the Law & Governance (01:30 PM – 02:50 PM) Chair: Ms. Hemangini Shekhawat, Asst. Professor, Biyani LAW College, Jaipur, INDIA	
01:30 PM – 1:40 PM	Welcome Address by Organizing Host BICON-2026 Dr. Sanjay BIYANI Director (Acad.), Biyani Group of Colleges, Jaipur, INDIA
01:40 PM - 02:00 PM	IL-1, Prof. (Dr.) Saroj Sharma BOHRA Professor & Dean, School of Law Presidency University, Bengaluru, Karnataka, INDIA
02:00 PM - 02:20 PM	IL-2, Dr. Shilpa Rao RASTOGI Head, Department of Law Vivekananda Global University, Jaipur, Rajasthan, INDIA
02:20 PM – 02:40 PM	IL-3, Adv. Prateek KASLIWAL Founder & Proprietor, The Law Desk Jaipur, Rajasthan, INDIA
02:40 PM – 02:50 PM	Vote of Thanks & Closing Remark Dr. Rajesh Kumar Verma Principal, Biyani LAW College, Jaipur, INDIA

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DAY-2: (21 September, 2026)

Invited Lecture-1

Energy from Weeds: A Stand-Alone Methane Fermentation System Using Cow Rumen Microbes for Disaster Resilience and Rural Energy Self-Sufficiency



Dr. Yasunori Baba

Ishikawa Prefectural University, Nonoichi, Ishikawa, Japan

Environmental Microorganism research Institute Co., Ltd., Nonoichi, Ishikawa, Japan

Affiliation:

- Associate Professor, Research Institute for Bioresources and Biotechnology, Ishikawa Prefectural University, Japan
- President and CEO, Environmental Microorganism Research Institute Co., Ltd., Japan

Education:

- 2014 Ph.D. in Agricultural Science, Graduate School of Agricultural Science, Tohoku University, Japan

Professional Appointments

- 2014 Postdoctoral Research Fellow (PD), Japan Society for the Promotion of Science(JSPS)
- 2016 Assistant Professor, Research Institute for Bioresources and Biotechnology, Ishikawa Prefectural University
- 2020 Lecturer, Ishikawa Prefectural University
- 2024 – present Associate Professor, Ishikawa Prefectural University
- 2022 – present Founder, President and CEO, Environmental Microorganism Research Institute, Co., Ltd.

Awards

- 2013 Tohoku University President's Award
- 2019 Young Researcher Award, Ministry of Agriculture, Forestry and Fisheries, (MAFF), Japan

Abstract**Energy from Weeds: A Stand-Alone Methane Fermentation System Using Cow Rumen Microbes for Disaster Resilience and Rural Energy Self-Sufficiency****Dr. Yasunori Baba***Ishikawa Prefectural University, Nonoichi, Ishikawa, Japan**Environmental Microorganism research Institute Co., Ltd., Nonoichi, Ishikawa, Japan**Corresponding Email ID: ybaba@ishikawa-pu.ac.jp***Abstract:**

After the Great East Japan Earthquake of March 2011, evacuation shelters in the affected region lost three essentials at once: hot food, light, and electricity to charge mobile phones. Centralized power and gas networks took weeks to recover. The author, who was in an evacuation shelter at the time, noticed that even when almost no supplies were available, weeds alone were still present all around. This led to a simple question: can biomass that is always available on site be converted into gas and electricity without external input? Plant residues, including weeds, crop residues and vegetable waste, are the most abundant biomass on earth, yet they are difficult to digest because the plant cell wall is highly recalcitrant. Conventional methane fermentation therefore depends on livestock manure or food waste. To overcome this limitation, we focused on the rumen of cattle, where a specialized microbial community degrades fibrous plant material every day. Rumen-derived microorganisms were cultivated in an artificial tank and applied to the anaerobic digestion of plant residues. The effect differed among plant species, but the use of rumen microorganisms increased methane production by approximately four to thirty times. The first paper describing this system was published in 2013. After more than ten years of basic research, the technology is now ready for practical use. Weeds and vegetable residues are loaded directly into the digester; no pretreatment and no skilled operation are required. The methane can be used directly as cooking gas, or converted into electricity by a small generator, providing enough power for lighting and mobile-phone charging at an evacuation site. Importantly, the unit operates without grid electricity and continues to function during a blackout.

The process also yields a liquid digestate: plant residues dissolve during fermentation, and the effluent can be applied directly as a liquid fertilizer. In paddy rice trials comparing no fertilizer, chemical fertilizer and digestate, the yield with digestate was comparable to that with chemical fertilizer. The system has been operating commercially in Japan since January 2024 at a supermarket in Ishikawa Prefecture, treating in-store vegetable waste. Two further installations, at a waste-treatment operator and at another supermarket, are scheduled for 2026. This work has been supported by Japan, Ministry of Economy, Trade and Industry, NEDO, the reconstruction Agency and Ishikawa Prefecture. Joint research with the University of Management and Economics (UME), the Royal University of Agriculture (RUA) and the Government of Cambodia has recently started

under the Science and Technology Research Partnership for Sustainable Development (SATREPS), a programme funded by the Japan International Cooperation Agency (JICA) and the Japan Science and Technology Agency (JST). The aim is to introduce the system to demined agricultural land in rural Cambodia. Farmers there have newly cleared farmland but cannot afford fertilizer or fuel. A mid-sized digester would allow them to produce gas, electricity and fertilizer from their own crop residues, reducing cash inputs and raising household income.

Our aim is to bring this technology into practical use in two directions: as a means of securing electricity during disaster-related blackouts and in regions where stable energy supply is difficult, and, by producing both fuel and fertilizer from plant residues, as a way to raise the income of agricultural businesses.

Keywords: Cow Rumen, Biomass, Fermentation, Electricity, Fuel, Fertilizer



Invited Lecture-2

Applications of Computational Fluid Dynamics in Biomedical Engineering

**Prof. Dhinakaran Shanmugam**

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Affiliation:

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Prof. Dhinakaran Shanmugam is a Professor of Mechanical Engineering at IIT Indore. His research interests include computational fluid dynamics, heat transfer, Multiphysics modelling, porous media, bluff-body flows and microfluidics. He obtained his Ph.D. in CFD and Heat Transfer from IIT Kharagpur and subsequently carried out postdoctoral research in France and Portugal.

He joined IIT Indore as an Assistant Professor in 2012. Over the years, his research has covered a wide range of thermal and fluid engineering problems, including porous-media heat transfer, lattice Boltzmann methods, nanofluids, solar thermal systems, microfluidics and biomedical applications. He has published 32 papers in SCI-indexed journals, including International Journal of Heat and Mass Transfer, Renewable Energy, International Journal of Mechanical Sciences, Chemical Engineering Science and Theoretical and Computational Fluid Dynamics. He has also authored the undergraduate textbook Thermal Engineering – A Unified Approach, published by World Scientific in 2026.

He has guided five Ph.D. scholars to completion in areas related to heat transfer, bluff-body flows, porous media, lattice Boltzmann methods and solar thermal systems. He has been the Principal Investigator or Co-Principal Investigator of several externally funded research projects supported by SERB, CSIR, DST and ICMR. He has also coordinated a number of GIAN courses involving international experts from institutions such as Imperial College London, the University of Calgary, Loughborough University, the University of Nevada and the University of California, Riverside.

In addition to teaching and research, he has served as Head of the Department of Mechanical Engineering at IIT Indore and has been actively involved in academic administration, faculty training and research mentoring.

Abstract**Applications of Computational Fluid Dynamics in Biomedical Engineering****Dhinakaran Shanmugam***Department of Mechanical Engineering, IIT Indore***Abstract**

Computational Fluid Dynamics (CFD) has become an important tool in biomedical engineering for understanding fluid flow and transport phenomena in the human body and in medical devices. Many biological systems involve complex interactions between fluid flow, heat transfer, mass transport and deformable biological tissues and these processes are often difficult to study directly through experiments alone. CFD provides a useful framework to analyse such systems in a controlled and quantitative manner.

This talk will present an overview of the applications of CFD in selected areas of biomedical engineering, with emphasis on how numerical simulations can support both basic understanding and practical design. Typical examples include blood flow through arteries, stenosed vessels, aneurysms and heart valves; airflow in the respiratory tract; transport of drugs and biological species; flow through porous biological tissues; and fluid motion in biomedical and diagnostic devices. The use of CFD in microfluidic systems, artificial organs, dialysis systems and other medical devices will also be discussed.

An important advantage of CFD is its ability to provide detailed information on quantities such as velocity, pressure, wall shear stress, recirculation zones and transport rates, which may be difficult to measure experimentally. In cardiovascular applications, for example, local haemodynamic parameters can be related to disease progression and vascular abnormalities. Similarly, respiratory flow simulations can help in understanding particle deposition and inhaled drug delivery. CFD can also be used to compare design alternatives in medical devices before prototype development, thereby reducing the number of experiments required.

The talk will also briefly discuss patient-specific CFD, where medical images such as CT or MRI data are used to reconstruct realistic geometries for simulation. This approach has considerable potential for personalised diagnosis, treatment planning and medical device development. At the same time, challenges related to geometric reconstruction, boundary conditions, rheological models, fluid–structure interaction, experimental validation and computational cost need to be carefully addressed.

Overall, CFD should be viewed not as a replacement for experiments or clinical observations, but as a complementary engineering tool that can improve our understanding of biological flows and assist in the development of safer and more effective biomedical technologies.

Keywords: Fluid Dynamics; Biomedical Engineering; Medical Devices; Geometric Reconstruction



Invited Lecture-3**Pioneering Next-Gen Materials: Synergizing Advanced Manufacturing, and Artificial Intelligence****Dr. Jimmy Karloopia****Affiliation:**

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About:

Dr. Jimmy Karloopia is presently working as an Assistant Professor in the Department of Production & Industrial Engineering at Punjab Engineering College (Deemed to be University), Chandigarh, India. He holds Ph.D. in Mechanical Engineering and M.Tech. in Metallurgical and Materials Engineering both from the Indian Institute of Technology Roorkee, along with a B.E. in Mechanical Engineering from Government College of Engineering and Technology, Jammu.

After completing his M.Tech., Dr. Karloopia began his professional journey as a Senior Engineer in a petroleum valve manufacturing industry at Qatar, where he gained industrial experience in precision manufacturing and quality assurance within the oil and gas sector. He later transitioned into academia, serving as a faculty member at various institutions including National Institute of Technology, Srinagar and Dr. B.R. Ambedkar National Institute of Technology, Jalandhar.

Dr. Karloopia is a recognized researcher in the areas of advanced materials and composites, materials processing and characterization, metal casting, recycling of metals and alloys, surface engineering, tribology and wear, machining and process optimization, additive manufacturing, biomedical implant materials, and sustainable manufacturing, with a focus on developing high-performance and application-oriented materials for emerging technological needs.

He has published extensively in peer-reviewed international journals and has presented his work at renowned conferences in India, Australia, and the United States of America. He holds five Indian and two international patents, and has authored and edited multiple books in the field of Advanced Materials and Manufacturing. His ongoing research focuses on the development and recyclability of high-performance Aluminium and Magnesium-based composites.

He has been honoured with multiple awards, including the Best Faculty Award consecutively from 2022 to 2024 by PEC Chandigarh and the Intellectual Property Right and Innovation Award 2024 by Wegrow Pvt. Ltd. He currently leads major research projects funded by the Anusandhan National Research Foundation (ANRF), Department of Science & Technology (DST), and PEC, with a cumulative grant of over ₹3 crores, focused on advanced composites, laser surface texturing, and defense applications.

He is also a Senate Member of Punjab Engineering College (Deemed to be University), Chandigarh. For the past three years, he has been serving as the Professor-in-Charge of Alumni, Corporate, and International Relations at PEC, where he oversees strategic partnerships, industry collaborations, and alumni engagement. With his continuous effort and leadership, the institute has mobilized over ₹8 crores through corporate tie-ups, endowments, and international partnerships.

Dr. Karloopia actively contributes as a reviewer to several reputed international journals, including Journal of Materials Science and Engineering: A, Journal of Hybrid Advances, Journal of Alloys and Compounds, International Journal of Biological Macromolecules, Journal of Metal Casting, Journal of Advances in Materials and Processing Technologies, and Journal of Mechanical Behavior of Materials, among others.

He has served as a National Advisory Committee Member and chaired multiple sessions for various international conferences hosted by IITs, NITs, and reputed private institutions across India, contributing significantly to academic discourse and research leadership in materials and manufacturing.

Dr. Karloopia is a Life Member of the Institution of Engineers (India) and the Indian Institute of Metals, and has been conferred with the Chartered Engineer certificate by the Institution of Engineers. He is also affiliated with leading international professional bodies including TMS, ASM International, ACerS, and AIST (USA).

Abstract

Pioneering Next-Gen Materials: Synergizing Advanced Manufacturing, and Artificial Intelligence

Jimmy Karloopia

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Abstract

The continuous progression of engineering demands has driven a fundamental transition from conventional monolithic alloys to tailored, multi-constituent material systems. While traditional metals served as the backbone of modern industry, their monolithic nature cannot satisfy the

combined requirements of extreme strength, lightweighting, thermal stability, and wear resistance dictated by modern technological environments. Tracing the historical evolution of materials from bulk metals through the micro-to-nano scale, composite systems-most notably Metal Matrix Composites (MMCs) have emerged as indispensable solutions. By reinforcing metallic matrices such as aluminum, magnesium, and titanium with ceramic particles, whiskers, or fibers, MMCs achieve superior specific stiffness, corrosion resistance, and high-temperature capability over their monolithic counterparts.

Achieving these engineered properties relies on advanced manufacturing routes, encompassing solid-state processes like powder metallurgy, additive manufacturing, and friction stir processing, as well as liquid-state methods including stir casting, liquid infiltration, disintegrated melt deposition, and in-situ reaction synthesis. These methods enable tailored components across key industries, including aerospace airframes, high-efficiency automotive powertrains, biocompatible orthopaedic implants, electronic thermal management systems, and marine structures. To overcome the inefficiencies of traditional empirical development, modern material science converges with advanced modeling, and Artificial Intelligence (AI). By integrating high-throughput virtual screening, Bayesian optimization, digital twins, and generative design, AI-driven frameworks compress decades of trial-and-error R&D into streamlined cycles optimizing synthesis parameters, predicting in-service performance, and powering intelligent, defect-free manufacturing..

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Invited Lecture-4

Real-World Emission Characterization of Heavy-Duty Vehicles Using the Versatile Source Sampling System (VS3) for Improved Emission Inventory Development in India



Prof. Gazala Habib

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Educational Background

- Post Doctoral Research in "Emissions and Loading of Climate-Forcing Aerosols from Biofuel Combustion". Fellowship funded by National Science Foundation, USA.
- Ph.D. in Aerosol Emission and Characterization (2005), Indian Institute of Technology Bombay.
- M.Tech. in Environmental Engineering (2000) from Visveswaraya National Institute of Technology, Nagpur.
- B.E. in Civil Engineering (1997) from National Institute of Technology, Raipur.

Professional Career

- Associate Professor (September 2018 - Present): Department of Civil Engineering, Indian Institute of Technology Delhi (IIT Delhi), New Delhi, India
- Assistant Professor (June 2008 - September 2018): Department of Civil Engineering, Indian Institute of Technology Delhi (IIT Delhi), New Delhi, India
- Research Associate (January 2007 - March 2008): University of California San Diego, California, USA.
- Research Associate (July 2005-December 2006): University of Illinois Urbana Champaign, Illinois, USA.
- Research Associate (February 2005 - May 2005): Indian Institute of Technology Bombay (IIT Bombay), Mumbai, India.

Publication:

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- Nandi I, Ganguly D, Habib G, Dey S (2026) Delhi cannot clean its air alone: airshed-scale mitigation outperforms local controls even under unfavourable winter meteorology. npj Clean Air 2:27
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Abstract**Real-World Emission Characterization of Heavy-Duty Vehicles Using the Versatile Source Sampling System (VS3) for Improved Emission Inventory Development in India****Gazala Habib**

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Abstract

Heavy-duty vehicles (HDVs) are important contributors to urban particulate and gaseous emissions; however, emission inventories in India remain uncertain because of limited emission factors representative of real-world driving conditions. This study presents an integrated approach for in-field characterization of HDV emissions and development of improved emission inventories using the indigenous Versatile Source Sampling System (VS3) developed at IIT Delhi. VS3 enables simultaneous measurement of diluted exhaust under actual on-road operation, facilitating characterization of PM_{2.5}, particle number and size distribution, black carbon, light-scattering properties, and gaseous pollutants. Measurements conducted on in-use HDVs capture emission variability associated with vehicle characteristics and transient driving conditions, including changes in speed, acceleration, deceleration, traffic and road conditions. Real-world emission factors derived from these measurements provide an improved alternative to generic or laboratory-

derived factors commonly employed in conventional inventories. The field-derived emission factors are integrated with updated vehicle activity data and spatial information to strengthen bottom-up emission estimates for the transport sector. The study demonstrates how indigenous source-sampling technology, real-world emission measurements and activity-based inventory development can reduce uncertainties in vehicular emission estimates, improve identification of high-emitting vehicle categories and provide a stronger scientific basis for air-quality modelling and targeted transport-emission control strategies in Indian cities.

Keywords: Air-Quality; Traffic; HDVs; Gaseous Emissions; Air Particulate



Invited Lecture- 5**Noninvasive Analysis of Submucosal and Subcutaneous Tissues
for Diagnosis and Presymptomatic Analysis****Prof. Hidetoshi SATO**

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Affiliation:

Apr. 2021-now	Professor School of Biological and Environmental Sciences Kwansei Gakuin University, Japan
Apr. 2009-Mar. 2021	Professor, School of Science and Technology, Kwansei Gakuin University, Japan
Nov. 2004-Mar. 2009	Research Unit Leader (Additional post), RIKEN
Apr. 2001-Mar. 2009	Researcher, RIKEN
Apr. 2000-Mar. 2001	Postdoctoral Researcher, RIKEN
Apr. 1997-Mar. 2000	Special Postdoctoral Researcher, RIKEN

Educations:

Doctor of Science (Apr. 1994-Mar. 1997)	School of Science, Kwansei Gakuin University
Master course Apr. 1992-Mar. 1994	School of Science, Kwansei Gakuin University
Graduate School Apr. 1988-Mar. 1992	School of Science, Kwansei Gakuin University
School Apr. 1985-Mar. 1988	Kwansei Gakuin High School

Abstract

Noninvasive Analysis of Submucosal and Subcutaneous Tissues for Diagnosis and Presymptomatic Analysis

Hidetoshi Sato

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Abstract:

The main component of fat in a body is triacylglycerol (TG). The TG molecule consists of three fatty acid (FA) chains and glycerol which are connected with ester bonding. A several types of FA are found in mammals, such as myristic acid (MA, 14:0), palmitic acid (PA, 16:0), stearic acid (SA, 18:0), oleic acid (OA, 18:1) linoleic acid (LA, 18:2) and so on. In our previous study, it was suggested that LA as well as saturated FAs, such as PA and SA, induced cell death of a liver model cell, HepG2 cell. The fact that some FAs can be toxic to specific cells, suggesting that the FA composition in body would give effects to the health of total body. The purpose of the present study is to develop techniques to estimate the quantitative compositions of the FAs in body fat based on Raman spectroscopy.

Methodology: For the purpose, it was necessary to develop two technologies: one was calibration models for fatty acyl composition in TG, and the other was a Raman probe for acquiring Raman spectra of subcutaneous fat.

Result and Discussion: It was quite difficult to develop the calibration model for Raman spectra because there were no standard materials for calibration dataset. Usually, chromatographic methods are used to identify the FA concentrations in calibration samples to build calibration models. However, it is quite difficult to obtain human samples. Furthermore, pure TG reagents are quite expensive and it is difficult to obtain sufficient quantities to prepare many calibration samples with high concentration accuracy. We used measured data of fatty acid methyl esters (FAMES) mixtures and successfully created calibration models by constructing the spectra of TG mixtures from that data through simulation. We developed a ball lens top hollow optical fiber Raman probe (BHRP) with a long working distance. Because the numerical aperture of the hollow optical fiber is small ($NA \leq 0.07$), BHRP exhibits confocal like optical property. Therefore, spectra of subcutaneous fat layer could be obtained without interference from the skin surface.

Conclusion: Raman spectroscopy is a powerful technique for quantitative analysis of fat species in live cells and tissues, as well as human body.

Keywords: Fat, Raman spectroscopy, Chemometrics, In situ analysis, Quantitative analysis

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Invited Lecture -6

From Bedside to Digital Frontline: Empowering Nurses to lead Smart, Safe and Human Centered Care



Dr. (Mrs) Rathi Balachandran

Affiliation: Former, ADG Nursing, MoHFW, Govt. of India and Associate Professor, College of Nursing, Atal Bihari Vajpayee Institute of Medical Sciences and Dr. Ram Manohar Lohia Hospital, New Delhi-110001, India

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Research / Professional Areas of Interest: Midwifery, Quality Management, Public Health, Nursing Research

Educational Qualifications

- B.Sc. Nursing, Calicut University/ Government College of Nursing, Calicut. Kerala in 1993
- MBA (HR) IGNoU in 2002
- M.Sc. Nursing (Community Health Nursing), Delhi University RAK College of Nursing
- PhD Nursing, Rajiv Gandhi University of Health Sciences, from INC- WHO Consortium in 2017

Professional Experience / Current Position

- Associate Professor in College of Nursing, ABVIMS & Dr RML Hospital for four years
- ADG Nursing, Ministry of Health and Family Welfare, Government of India for Seven years
- Tutor in College of Nursing, Dr RML Hospital for 18 years
- Lecturer in Calicut University for one year
- Clinical Instructor cum Tutor in St Martin De Pores School of Nursing, Kannur, Kerala for two years

Key Achievements / Awards / International Collaborations

- Certified National level External Quality assessor of Public Health facility under National Quality Assurance Standards (NQAS), Kayakalp, LaQshya, Muskan.

- Certified Quality Coach and facilitator under National Quality of Care Network (NQoCN).
- Global Nursing Leadership Institute Alumini, International Council of Nurses, Geneva,
- Fellow of Indo American on Evidence Based Practice Academy in collaboration with Johns Hopkins Nursing Center for Evidence-Based Practice, USA

Publications / Patents / Books

- Development and evaluation of a training and trainers' intervention for Nursing professionals during COVID -19 pandemic in India in Lancet Series
- A Study to Determine the Managerial and Supervisory Competencies of Ward Sisters with a View to Develop and Evaluate an In-Service Education Program in a selected hospital in Delhi
- Guidebook for Nurses on Tobacco Cessation and Drug Dependence Treatment-2019
- Training Module and Facilitator Module on National Emergency Life Support for Nurses2022
- Mental Health Self-care- A Step-by-Step training package for Nurses and A Step-by-Step guide for Health professionals- 2022

Abstract**From Bedside to Digital Frontline: Empowering Nurses to lead Smart, Safe and Human Centered Care****Rathi Balachandran**

College of Nursing, Atal Bihari Vajpayee Institute of Medical Sciences, Guru Gobind Singh Indraprastha University, India

Abstract: Nursing is at a pivotal point of transformation. Globally, nurses are increasingly moving from traditional task-oriented roles towards competency-based practice, advanced clinical roles, leadership, innovation and technology-enabled care. The *State of the World's Nursing 2025* highlights the importance of investing in nursing education, advanced practice, leadership and workforce development to strengthen health systems. In parallel, digital health is creating new opportunities for safer, more connected and patient-centered care through electronic health records, telehealth, artificial intelligence, interoperable information systems and smart technologies.

Objective: To examine the evolution of nursing reforms in India and propose Smart Nursing and Digital Patient Care Systems as a strategic pathway for strengthening nursing practice, patient safety, clinical decision-making and health-system performance.

Methods: A narrative review was undertaken using the nursing reforms documented in the contemporary national and international evidence on advanced nursing practice and digital health. Reforms were examined across education, competency development, advanced practice, career progression, midwifery, quality improvement and digital transformation.

Results: India's nursing reforms demonstrate a progressive transition towards competency-based education, simulation-based learning, advanced practice, continuing professional development, expanded community roles and structured career progression. Nurse Practitioner programmes, Nurse-Midwife-Led Units, Community Health Officer roles and participation in national quality-assurance programmes demonstrate the expanding professional contribution of nurses and midwives. The next frontier is Smart Nursing—integrating nursing expertise with digital technologies to deliver timely, evidence-based and personalized care. Digital patient-care systems can support electronic nursing documentation, real-time vital-sign monitoring, clinical decision support, medication safety, electronic care plans, tele-nursing, remote monitoring, predictive analytics, digital patient education and seamless communication across the continuum of care. India's ABDM provides an important foundation for interoperable digital health systems and secure exchange of health information.

Conclusion: The future of nursing is not technology replacing nurses, but technology empowering nurses. Smart Nursing should combine human compassion, clinical judgement and professional accountability with digital intelligence. Successful transformation requires digital competencies in nursing education, interoperable systems, cybersecurity and data privacy, user-friendly technology, leadership and continuous workforce development.

Implications: India is moving from “Nursing Reform” to “Smart Nursing Transformation” by preparing digitally competent nurses who can function as clinicians, innovators, care coordinators, data-informed decision-makers and leaders of digital patient care.

Keywords: Smart Nursing; Digital Health; Digital Patient Care; Advanced Nursing Practice; Nursing Informatics; Patient Safety



Invited Lecture -7

Tiny Particles, Powerful Medicine: The Future of Nanomedicine and Advanced Drug Delivery Systems



Prof. Amit Kumar Goyal

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Areas of Interest: Nanotechnology; Formulation and Delivery of Drugs, Vaccines, and Herbal Bioactive.

Educational Qualifications

- Ph.D. in Pharmacy, Dr. H.S. Gour University, 2009
- M. Pharm., Dr. H.S. Gour University, 2003

Professional Experience / Current Position

- Professor, Central University of Rajasthan, Since June 2019
- Scientist E, National Institute of Animal Biotech., Hyderabad

Key Achievements / Awards / International Collaborations

- Recognition under top 2% scientists by Stanford University Elsevier BV
- Sir C. V. Raman Young Scientist Award 2020 from SPIHER, Chennai
- APTI Young Teacher Award 2017 by APTI
- PTU's Best Teacher Award-2013 by IKGPTU, Jalandhar
- OPPI Young Scientist Award-2012 by OPPI
- DBT's Innovative Young Biotechnologist Award-2009 from DBT, New Delhi
- MPCST Young Scientist by MPCST

Publications:

- Rath, G., Hussain, T., Chauhan, G., Garg, T., & Goyal, A. K. (2016). Collagen nanofiber containing silver nanoparticles for improved wound-healing applications. *Journal of Drug Targeting*, 24(6), 520–529.
- Johal, H. S., Garg, T., Rath, G., & Goyal, A. K. (2016). Advanced topical drug delivery system for the management of vaginal candidiasis. *Drug Delivery*, 23(2), 550–563.
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Abstract**Tiny Particles, Powerful Medicine: The Future of Nanomedicine and Advanced Drug Delivery Systems****Prof. Amit Kumar Goyal***Department of Pharmacy, Central University of Rajasthan, Bandar Sindri, Ajmer, Rajasthan, India*

Abstract: Nanomedicine is increasingly influencing the development of modern pharmaceutical therapies by offering new ways to improve how drugs are formulated, transported, and released in the body. Many therapeutic molecules have limitations such as poor solubility, inadequate stability, low bioavailability, or rapid elimination, which can reduce their clinical effectiveness. Nanotechnology provides several approaches to address these challenges. Systems such as nanoparticles, liposomes, nanoemulsions, nanogels, and lipid-based carriers can be designed to protect therapeutic molecules, improve their delivery, and control the rate at which drugs are released. These approaches may also help increase drug accumulation at desired sites while limiting unnecessary exposure to healthy tissues.

Methodology: Different formulation and manufacturing techniques are available for preparing nanoscale drug-delivery systems. Depending on the properties of the drug and the intended application, methods such as electrospinning, solvent evaporation, emulsification, and nanoprecipitation can be employed. The choice of technique is influenced by several factors, including the physicochemical characteristics of the drug, the type of carrier material, the desired particle properties, and the intended route of administration.

Results and Discussion: Advanced drug-delivery systems have shown considerable potential for improving the performance of therapeutic agents. At the nanoscale, formulation strategies can enhance drug solubility and stability, protect sensitive compounds from premature degradation, and provide more sustained drug release. Some nanocarriers can also improve cellular uptake and facilitate delivery to specific tissues or cells. These characteristics may allow therapeutic effects to be maintained for longer periods while potentially reducing unwanted systemic exposure.

An additional advantage of nanomedicine is its potential to support more individualized approaches to treatment. By modifying the composition, size, surface characteristics, and release properties of a carrier, researchers can tailor drug-delivery systems to particular therapeutic requirements. Nevertheless, promising laboratory findings do not automatically translate into successful clinical products. Issues related to toxicity, biocompatibility, long-term safety, batch-to-batch consistency, large-scale manufacturing, stability, regulatory approval, and quality control remain important challenges.

Conclusion: Nanomedicine represents an exciting direction in pharmaceutical research and drug-delivery science. Its greatest potential lies not simply in making drug particles smaller, but in using nanoscale materials to solve specific problems associated with conventional therapy. Better control over drug stability, distribution, cellular uptake, and release could contribute to safer and more effective treatments. At the same time, continued research is essential to establish the long-term safety, reproducibility, scalability, and clinical value of these systems. A balanced approach combining pharmaceutical science, nanotechnology, biology, and rigorous clinical evaluation will be essential for translating promising nanomedicine concepts into practical therapies.

Keywords: Nanomedicine, Nanoparticles, Nanofibers, Nanoemulsions, Nanogels, Liposomes, Advanced Drug Delivery, Targeted Drug Delivery, Controlled Drug Release



Invited Lecture -8

How a White-Rot Fungus Adapts to Toxic Compounds Produced during Lignin Degradation



Dr. LEE Junseok

Affiliation:

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Research Areas of Interest: Methane fermentation; bioenergy production; lignocellulosic biomass degradation; biological pretreatment using white-rot fungi; agricultural residue valorisation; sustainable biomass utilization

Educational Qualifications

- PhD, Applied Life Sciences, Kyoto University, Japan, 2026
- MSc, Applied Life Sciences, Kyoto University, Japan, 2020

Professional Experience

- Research Fellow, Ishikawa Prefectural University, Japan, May 2026–Present

Key Achievements:

- Japan–Korea Joint Scholarship Program for Science and Engineering Students (Undergraduate Program), 2009–2014
- Research Contributor, SATREPS Project on agricultural residue conversion into renewable energy and biofertilizers in Cambodia, May 2026–Present

Publications:

- Lee J., et al. (2026). Diversity of Aromatic Aldehyde Dehydrogenases in Ceriporiopsis subvermispora: Insights into Fungal Vanillin Metabolism. Applied Biochemistry and Biotechnology, 198(1):472–491.
- Watanabe T., et al. (2017). Preparation of intracellular proteins from a white-rot fungus surrounded by polysaccharide sheath and optimization of their two-dimensional electrophoresis for proteomic studies. Journal of Microbiological Methods, 142:63–70.

Abstract**How a White-Rot Fungus Adapts to Toxic Compounds Produced during Lignin Degradation****Junseok LEE***Ishikawa Prefectural University, Japan***Abstract:**

Lignocellulosic biomass, including wood and agricultural residues, is an abundant renewable resource that can be used for the production of fuels, chemicals, and other useful materials. However, its efficient utilization is limited by lignin, a complex aromatic component of plant cell walls that protects cellulose and other carbohydrates from degradation. White-rot fungi are microorganisms capable of efficiently degrading lignin and therefore have potential applications in the biological pretreatment of lignocellulosic biomass. During lignin degradation, however, various aromatic compounds are produced as intermediates. Some of these compounds, such as vanillin, can be toxic and inhibit the growth and metabolism of many microorganisms. Interestingly, the selective white-rot fungus *Ceriporiopsis subvermispora* shows high tolerance to vanillin. This study investigated how this fungus detoxifies and adapts to lignin-derived aromatic compounds, with a particular focus on its response to vanillin.

Methodology: The response of *C. subvermispora* to vanillin was investigated at three biological levels. First, aldehyde dehydrogenases, enzymes that can convert toxic aromatic aldehydes into less toxic organic acids, were identified and characterized. Their activities toward several lignin-derived aromatic aldehydes were examined to evaluate their functional diversity. Second, RNA sequencing was used to investigate changes in gene expression after exposure to vanillin and to identify cellular processes involved in the fungal response. Third, GC–MS analysis was used to examine changes in metabolites and to investigate how vanillin was transformed by the fungus. Together, these approaches allowed the response to vanillin to be examined from individual detoxification enzymes to broader changes in cellular metabolism.

Results and Discussion: Sixteen aldehyde dehydrogenases were identified in *C. subvermispora*. These enzymes showed different activities toward lignin-derived aromatic aldehydes, indicating that the fungus possesses multiple enzymes with complementary functions for detoxifying a variety of aromatic compounds. Vanillin exposure also caused broad changes in gene expression. Genes associated with detoxification and stress adaptation were activated, while several pathways related to lipid biosynthesis were suppressed. Metabolite analysis further demonstrated that vanillin was transformed into less toxic compounds, including aromatic acids. Dark-brown pigments were also formed during cultivation, suggesting that additional, as-yet-uncharacterized responses may contribute to the alleviation of vanillin-induced stress. Taken together, these findings indicate that *C. subvermispora* does not rely on a single detoxification pathway. Instead, the fungus coordinates

multiple enzymatic and metabolic responses to tolerate and transform potentially toxic aromatic compounds generated during lignin degradation.

Conclusion: *C. subvermispora* adapts to lignin-derived aromatic compounds through a coordinated response involving detoxification enzymes, changes in gene expression, and metabolic reorganization. This ability may help the fungus maintain its growth and lignin-degrading activity even in the presence of inhibitory compounds. Understanding these natural detoxification mechanisms provides further insight into how white-rot fungi survive during lignin degradation and may contribute to the development of more effective biological pretreatment strategies for the sustainable utilization of lignocellulosic biomass.

Keywords: White-rot fungus; Lignin degradation; Vanillin; Detoxification; Lignocellulosic biomass



Invited Lecture-9**Visualizing Brain Structures Using Advanced Imaging Technologies****Prof. Ikuko Yao****Affiliation:**

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- Position, Institution / Organization, Duration: Assistant/Associate Professor, Department of Biochemistry, Kansai Medical University, Japan (2009–2013)
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Key Achievements:

- Young Investigator Award, Japanese Society for Medical Mass Spectrometry (2013)
- Medical Research Encouragement Grant, Takeda Science Foundation (2012)
- Kiyoko Wada Award, Kansai Medical University (2010)

Publications:

- Sasano Y et al., Biomedical Research, 44(4), 173-179 (2023).
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Abstract**Visualizing Brain Structures using Advanced Imaging Technologies****Ikuko Yao***School of Biological and Environmental Sciences, Kwansei Gakuin University**Corresponding Email: yaoik@kwansei.ac.jp***Abstract:**

Neurons communicate through excitatory and inhibitory synaptic transmission, which are primarily mediated by neurotransmitters such as glutamate and gamma-aminobutyric acid (GABA). Altered levels and distributions of these neurotransmitters in specific brain regions are closely associated with neurological and psychiatric disorders, including schizophrenia and obsessive-compulsive disorder. Therefore, visualizing neurotransmitters within biological tissues is essential for understanding brain function and disease mechanisms.

In recent years, matrix-assisted laser desorption/ionization imaging mass spectrometry (MALDI-IMS) has emerged as a powerful technique for mapping the spatial distribution of biomolecules directly in tissue sections. Although low-molecular-weight compounds such as amino acid neurotransmitters are difficult to detect by conventional MALDI-IMS, recent advances in chemical derivatization strategies have significantly improved their visualization. In this presentation, we will introduce several approaches for neurotransmitter imaging and demonstrate representative applications of these methods in brain tissue analysis.

In parallel with advances in mass spectrometry imaging, optical microscopy has made remarkable progress. Super-resolution microscopy now enables the visualization of cellular and subcellular structures beyond the diffraction limit of light, providing unprecedented insights into the organization of neural circuits and synapses.

Although these imaging modalities reveal different aspects of biological systems, their integration has the potential to provide a more comprehensive understanding of brain structure and function. Future developments combining molecular imaging, mass spectrometry, and super-resolution microscopy are expected to enable multi-scale analyses linking molecular distributions with cellular architecture and neural activity.

Keywords: neurotransmitter, mass spectrometry, super resolution, microscopy



Invited Lecture -10

Integrating Computational Intelligence, Digital Health, and Machine Learning into Ayurveda and Yoga: An Interdisciplinary Framework for Modern Healthcare



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International Collaborations:

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- Teaching Innovation Award - 2025, Teaching Excellence Award - 2024

Publications:

- Patent, Automatic Speech Generation, Dr. Sumit Kalra & Dr. Arpit Khandelwal (IIT Jodhpur), Dr. Abhinav Dixit, Dr. Amit Goyal & Dr. Nithin (AIIMS Jodhpur) India Patent 380040(2021)
- Patent, Smartphone with detachable input and output (I/O) components (DIOC), Sumit Kalra, Chinmoy Mukherjee, R Nallusamy US Patent 8639299 (2014)
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- A Vashisht, G C Gandhi, S Kalra, D K Saini, Hybrid robot navigation: Integrating monocular depth estimation and visual odometry for efficient navigation on low-resource hardware Computers and Electrical Engineering 2025

Abstract

Integrating Computational Intelligence, Digital Health, and Machine Learning into Ayurveda and Yoga: An Interdisciplinary Framework for Modern Healthcare

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Abstract:

The integration of traditional Indian Knowledge Systems—such as Ayurveda and Yoga—into mainstream healthcare requires modern computational frameworks, evidence-based validation, and user-centric digital architecture. This work presents an interdisciplinary research domain at the intersection of software engineering, artificial intelligence (AI), mobile health (mHealth), and traditional medicine systems. Our research encompasses three primary pillars: Digital Health & Quality Benchmarking: Systematic architectural evaluations and quality assessments of mobile applications dedicated to Ayurveda, identifying challenges in software design, usability, and health information accuracy in the digital AYUSH ecosystem. Clinical & Integrative Yoga Interventions: Rigorous clinical investigations—such as randomized controlled trials evaluating Nada Yoga (sound music therapy)—demonstrating the efficacy of non-invasive complementary mind-body therapies in reducing anxiety and enhancing quality of life for oncology patients. AI/ML for Traditional Medicine Analytics: Application of machine learning algorithms, voice analysis, and sensor-based telemetry to classical Ayurvedic protocols, including therapeutic bio-purification procedures (Vamana Karma) and personalized phenotypic profiling (Prakriti assessment). By bridging traditional wisdom with data-driven intelligence, this body of work establishes standardized, scalable, and evidence-based methodologies for digitizing Indian Systems of Medicine and translating holistic healthcare interventions into global clinical and digital health contexts.

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CONTRIBUTED PAPERS**Abstract****AI in Healthcare Sciences****Kushagra Jain¹ and Rekha Mithal²**¹*Department of Electronics and Communication Engineering, JECRC Foundation, Jaipur*²*Department of Chemistry, JECRC Foundation, Jaipur, Rajasthan, India**Corresponding Email ID: kushagrajain.ece29@jecrc.ac.in***Abstract:**

Generation Z is coming of age at the intersection of ubiquitous digital technology and a healthcare landscape increasingly shaped by Artificial Intelligence (AI). Unlike earlier generations, Gen Z has grown up with smartphones, social media, and AI-driven recommendation systems as default sources of information, including information about health. This raises important questions about how young adults are actually managing their physical and mental well-being: whether they rely on formal medical guidance, informal digital sources, or a mix of both, and whether growing health awareness is translating into consistent, healthy behaviour. Understanding these patterns is essential for designing AI-based healthcare tools, such as chatbots, telemedicine platforms, and mental health apps, that genuinely fit how this generation seeks and acts on health information.

A mixed-mode survey was conducted among 50-100 respondents aged 18-24, combining in-person interviews with an online questionnaire to capture a representative cross-section of Gen Z participants. The survey instrument covered three areas: the primary sources consulted for health-related information, awareness and prioritisation of mental health, and consistency between stated health awareness and actual day-to-day health behaviour. Responses were analysed to identify recurring patterns in information-seeking behaviour and self-reported health practices, with particular attention to the role that digital and AI-driven platforms play in shaping these patterns.

Social media emerged as the dominant source of health-related information and advice among the respondents, frequently outweighing formal medical consultation or verified health resources. This reliance reflects both the accessibility and immediacy of social platforms, but also raises concerns about the accuracy and reliability of health guidance obtained this way. In parallel, respondents demonstrated notably higher awareness of mental health as a legitimate concern, with strong recognition of stress, anxiety, and burnout compared to earlier generational benchmarks. However, this awareness did not consistently translate into follow-through: many respondents acknowledged recognising mental health issues without acting on them, whether through professional help-seeking or sustained self-care practices. These findings point to an awareness-action gap that represents a clear opportunity for AI-driven interventions, such as personalised reminders, accessible AI-based mental health chatbots, and credibility-verified health content curation, to help close the space between what Gen Z knows and what Gen Z actually does

The findings indicate that Gen Z's healthcare behaviour is shaped less by traditional medical channels and more by digital and social ecosystems, with mental health awareness running ahead of consistent action. This awareness-action gap presents a clear opportunity for AI-integrated healthcare solutions, from verified health information embedded in social platforms to AI-powered mental health support tools, to convert passive awareness into active, sustained health practices. Future research should evaluate specific AI interventions designed for this demographic, measuring not just engagement but genuine improvements in behaviour and health outcomes over time.

Keywords: Artificial Intelligence, Generation Z, Digital Health Behaviour, Mental Health Awareness, Health Information Seeking.



Efficacy of *Cascabela thevetia* Leaf Extract against *Helicoverpa armigera*

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Abstract:

The present investigation evaluated the biological activity of an acetone leaf extract of *Cascabela thevetia* against the economically important lepidopteran pest *Helicoverpa armigera*. Laboratory bioassays were conducted using fourth- and fifth-instar larvae exposed through feeding, topical, and contact application methods. In the feeding assay, corrected mortality in fourth-instar larvae increased from 36.17% at 25 ppm to 48.94% at 75 ppm and reached 100% at 100 ppm. In fifth-instar larvae, corrected mortality was 50.00%, 52.17%, and 58.70% at 25, 50, and 75 ppm, respectively, and reached 100% at 100 ppm. Topical and contact treatments also produced concentration-related mortality and reductions in adult emergence. The data indicate that *C. thevetia* leaf extract has laboratory bioactivity against *H. armigera*; additional replicated trials, solvent-control results, and complete statistical reporting are needed before practical application can be inferred.

Keywords: *Cascabela thevetia*, *Helicoverpa armigera*, botanical insecticide, acetone extract, larval mortality, adult emergence

Introduction: *Cascabela thevetia* is a biologically active plant that has been investigated for several pharmacological and pesticidal properties. Previous studies have also indicated insecticidal potential associated with different preparations of the plant. The present study was therefore undertaken to assess the efficacy of an acetone leaf extract of *C. thevetia* against fourth- and fifth-instar larvae of

H. armigera, with particular emphasis on larval mortality, developmental duration, adult emergence, fecundity, and egg hatchability.



Figure 2: Fresh leaves of *Cascabela thevetia*



Figure 1: Pod hole with Pod borer (*Helicoverpa armigera*)

Plant-derived products have gained increasing attention as potential components of sustainable pest management. Botanical insecticides may contain several biologically active secondary metabolites and can produce insecticidal, antifeedant, growth-regulating, developmental, and reproductive effects. Their diverse biological activity makes plant extracts promising candidates for screening against economically important insect pests. Isman (2006) emphasized the continuing importance of botanical products as sources of insecticides, deterrents, and repellents in pest management.

Materials and Methods: Collection and Preparation of Plant Material: Healthy leaves of *Cascabela thevetia* were collected and washed thoroughly with distilled water to remove adhering dust and contaminants. Diseased or infected portions were discarded. The healthy material was dried in the shade at $27 \pm 2^\circ\text{C}$ for approximately 20 days until completely dry. The dried leaves were powdered using a mixer grinder and sieved to obtain a fine powder.

Preparation of Acetone Extract: The powdered leaves were subjected to Soxhlet extraction using analytical-grade acetone. Twenty grams of dried powder were placed in a cellulose thimble and extracted using acetone in a Soxhlet apparatus. The extraction was continued for approximately 6–8 h. The resulting extract was filtered and concentrated under reduced pressure using a rotary evaporator at a temperature below 40°C . The concentrated crude extract was transferred to sterilized, airtight glass vials and stored at 4°C until use.

Preparation of Test Solutions: A 5% (w/v) stock solution was prepared by dissolving 5 g of concentrated crude extract in analytical-grade acetone and making the final volume up to 100 mL. Working concentrations were prepared by serial dilution from the stock solution.

Rearing of *Helicoverpa armigera*: The laboratory culture of *H. armigera* was maintained under controlled conditions of approximately $27 \pm 3^\circ\text{C}$ temperature, $75 \pm 5\%$ relative humidity, and a 14:10 h light: dark photoperiod. Neonate larvae were initially reared in groups and subsequently

transferred individually to avoid cannibalism. Fresh natural food was supplied regularly, and rearing containers were cleaned to maintain hygienic conditions. Adults were maintained in cages and supplied with 10% sucrose solution.

Experimental Design and Bioassay: Only fourth- and fifth-instar larvae were selected for the experimental bioassays. Each treatment consisted of 25 larvae. Three application methods were employed: feeding, topical, and contact. For feeding bioassays, treated food was supplied after complete evaporation of acetone. In topical assays, measured doses were applied directly to the larval body using a micro-applicator. Contact exposure was conducted according to the experimental protocol used for the study. The feeding treatments were tested at 25, 50, 75, and 100 ppm, whereas topical and contact treatments were evaluated at 10, 20, 30, 40, and 50 ppm. Appropriate untreated controls were maintained simultaneously.

Parameters Recorded: Larval mortality, larval duration, pupal duration, adult emergence, fecundity, and egg hatchability were recorded. Developmental abnormalities associated with larval-pupal and pupal-adult transitions were also documented.

Statistical Analysis: Larval mortality data were expressed as corrected mortality using Abbott's formula. Statistical comparisons among treatment groups were performed using one-way Analysis of Variance (ANOVA) followed by Tukey's HSD test, with significance evaluated at $p < 0.05$.

Results:

Effect of Feeding Treatment on Fourth-Instar Larvae: Feeding exposure to *C. thevetia* leaf extract produced a concentration-dependent increase in larval mortality. Corrected mortality in fourth-instar larvae was 36.17%, 42.55%, and 48.94% at 25, 50, and 75 ppm, respectively, and reached 100% at 100 ppm. Adult emergence declined from 60% at 25 ppm to 54% at 50 ppm and 48% at 75 ppm; the untreated control recorded 94% adult emergence. For fourth-instar larvae, mean larval durations were 17.20, 18.00, and 17.20 days at 25, 50, and 75 ppm, respectively, compared with 16.00 days in the control. Corresponding pupal durations were 11.02, 11.90, and 12.00 days, compared with 10.20 days in the control.

Adult emergence declined with increasing concentration. Emergence was 60% at 25 ppm, 54% at 50 ppm, and 48% at 75 ppm, while no adult emergence was recorded at 100 ppm. The control showed 94% adult emergence. Among adults emerging from treated fourth-instar larvae, fecundity was 81 eggs per female at 50 ppm and 75 eggs per female at 75 ppm, compared with 92 eggs per female in the control. Egg hatchability was 92.51% at 50 ppm and 74.69% at 75 ppm, compared with 86.95% in the control. Thus, a lower fecundity was observed at both reported treatment concentrations, whereas hatchability was lower only at 75 ppm.

Effect of Feeding Treatment on Fifth-Instar Larvae: Fifth-instar larvae of *Helicoverpa armigera* showed a concentration-dependent response to feeding exposure. Corrected mortality was 50.00% at 25 ppm, 52.17% at 50 ppm, and 58.70% at 75 ppm, while complete mortality was recorded at 100 ppm. For surviving fifth-instar larvae, mean larval durations were 14.60, 13.20, and 13.00 days at 25, 50, and 75 ppm, respectively, compared with 15.01 days in the control. Corresponding pupal

durations were 9.01, 9.14, and 8.20 days, compared with 8.63 days in the control. Adult emergence declined to 46%, 44%, and 38% at 25, 50, and 75 ppm, respectively, and was completely suppressed at 100 ppm. The untreated control recorded 92% adult emergence. Among adults emerging from treated fifth-instar larvae, fecundity declined to 81 eggs per female at 50 ppm and 75 eggs per female at 75 ppm, compared with 94 eggs per female in the control. Egg hatchability declined to 60.00% and 52.40%, respectively, compared with 88.00% in the control.

Effect of Topical Treatment on Fourth-Instar Larvae: Topical treatment of fourth-instar larvae resulted in a concentration-dependent response. Corrected mortality was 28.26%, 28.26%, 30.43%, 36.96%, and 43.48% at 10, 20, 30, 40, and 50 ppm, respectively. Adult emergence was 66%, 66%, 64%, 58%, and 52%, respectively, compared with 92% in the control. The mean larval periods in the topical fourth-instar treatment were 15.00, 16.01, 16.00, 17.00, and 17.20 days at 10, 20, 30, 40, and 50 ppm, respectively, compared with 20.01 days in the control. The corresponding pupal periods were 10.00, 9.17, 9.06, 10.00, and 9.20 days, compared with 12.00 days in the control. Reproductive performance of adults emerging from topical-treated fourth-instar larvae was lower at the higher reported doses. Fecundity was 70, 66, and 60 eggs per female at 30, 40, and 50 ppm, respectively, compared with 90 eggs per female in the control. Egg hatchability was 62.00%, 60.00%, and 56.00%, respectively, compared with 86.95% in the control.

Effect of Contact Treatment on Fifth-Instar Larvae: Contact exposure of fifth-instar larvae produced a progressive increase in corrected mortality from 21.62% at 10 ppm and 29.72% at 20 ppm to 35.13%, 39.18%, and 48.64% at 30, 40, and 50 ppm, respectively. Mortality in the control group was 8%. Adult emergence in the fifth-instar contact treatment was 72%, 65%, 60%, 56%, and 48% at 10, 20, 30, 40, and 50 ppm, respectively, compared with 92% in the control. The reproductive capacity of surviving adults was also reduced. Fecundity was 115, 108, and 94 eggs per female at 30, 40, and 50 ppm, respectively, compared with 230 eggs per female in the control. Egg hatchability was 52.60%, 46.00%, and 40.50%, respectively, compared with 90.00% in the control.

Developmental Abnormalities: In addition to mortality, developmental abnormalities were observed following treatment. Treated larvae subsequently produced malformed or reduced-size pupae, including individuals showing retained larval exuviae and abnormalities during larval-pupal transition. Deformed adults with crumpled, incompletely expanded, or otherwise abnormal wings were also observed after larval treatment, indicating that the effects of the extract extended beyond direct larval mortality.

Discussion: The present investigation indicates that the acetone leaf extract of *C. thevetia* produced concentration-related effects on *H. armigera* larvae under the reported laboratory conditions. Feeding exposure produced complete mortality at 100 ppm in both fourth- and fifth-instar larvae. At 75 ppm, corrected mortality was 48.94% in fourth instars and 58.70% in fifth instars. The reduction in adult emergence indicates that larval exposure affected the ability of some individuals to complete development. Adult emergence declined as concentration increased in the feeding, topical, and contact assays. Developmental abnormalities, including malformed pupae and deformed adults,

were observed following larval treatment; these observations should be supported by labeled images and counts of affected insects.

The extract altered developmental duration, although the direction and magnitude of change varied by instar, treatment method, and concentration. The data should therefore be interpreted as treatment-related developmental effects rather than as uniformly prolonged development. Another reported finding was a reduction in reproductive performance among surviving adults, particularly at higher concentrations. Fecundity and egg hatchability generally declined in the fifth-instar feeding, topical, and contact treatments. However, hatchability in the fourth-instar feeding assay at 50 ppm was higher than the control, so the pattern should not be described as uniform across all treatments.

The study is relevant to botanical pest-management research because insecticide resistance has been reported in Indian *H. armigera* populations (Kranthi et al., 2002). However, plant-derived products can only be considered supplementary integrated-pest-management tools after replicated laboratory studies, chemical characterization, formulation work, field evaluation, and non-target safety testing.

The present study did not include phytochemical characterization or biochemical investigations. Therefore, although the observed effects may be associated with bioactive constituents of *C. thevetia*, the present data do not permit assignment of the response to a specific compound or physiological mechanism. Further studies involving chemical characterization, formulation, field evaluation, persistence, and non-target safety would be necessary before practical application.

Conclusion: Under the reported laboratory conditions, acetone leaf extract of *Cascabela thevetia* showed concentration-related effects on *H. armigera* mortality and adult emergence. Feeding treatment produced complete mortality at 100 ppm in both instars, while topical and contact treatments also reduced survival and reproductive outcomes at higher concentrations. The study should be presented as preliminary laboratory evidence. Replicate-level reporting, solvent controls, defined dose units, complete statistical outputs, chemical characterization, and safety evaluation are needed before any practical application is proposed.

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Comparative RSM-ANN Optimisation of Microwave-Assisted Esterification Reaction Using Acid-Treated Fly Ash Solid Acid Catalyst

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Abstract:

The conversion of coal fly ash into a functional solid acid catalyst offers an attractive waste-valorisation approach for sustainable chemical synthesis. Acid-treated fly ash can provide heterogeneous acidic active sites while enabling the beneficial utilisation of an industrial waste material. Esterification reactions are one of the most industrially important reactions. However, esterification performance is strongly influenced by reaction temperature, reaction time, catalyst loading, and reactant molar ratio. Therefore, systematic optimisation is required to achieve high ester yield with minimum resource consumption. Esterification performance is affected by several reaction variables and their interactions, making reliable modelling and optimization essential. Therefore, Response Surface Methodology (RSM) and Artificial Neural Network (ANN) modelling were comparatively investigated to establish relationships between reaction parameters and esterification performance and to identify favourable operating conditions.

Fly ash was treated with sulphuric acid to modify its surface properties and increase the concentration of catalytically active acidic sites. The sulphuric acid-treated fly ash (SAF) was characterised by XRD, N₂ adsorption-desorption, SEM-EDX, FTIR, and pyridine FTIR. The esterification reaction was performed under controlled laboratory conditions, including reaction temperature, reaction time, catalyst loading, and reactant molar ratio. Experimental data were used to develop both RSM and ANN models for prediction of ester conversion and yield. RSM was employed to evaluate the individual and interactive effects of the process variables and to identify suitable operating conditions through response surface analysis. In parallel, an ANN model was developed to capture nonlinear relationships between the experimental input variables and esterification responses. Finally, the optimum reaction conditions predicted using the developed RSM model were validated by experimental results.

The optimised esterification process demonstrated 95% conversion and 89% ester yield using the acid-treated SAF catalyst under microwave irradiation. The optimum reaction conditions were achieved at a temperature of 90 °C and a reaction time of only 10 min, with a substrate-to-catalyst ratio of 5:1. The high conversion obtained within a short reaction period demonstrates the effectiveness of microwave irradiation in promoting rapid esterification and highlights the catalytic potential of FAS. The relatively high ester yield of 89% further indicates that the acid treatment of fly ash generated catalytically active acidic sites capable of facilitating the esterification reaction. Comparative modelling using RSM and ANN provided insight into the relationship between the selected reaction parameters and esterification performance. RSM offered an interpretable statistical

approach for evaluating parameter effects and interactions, while ANN provided a flexible data-driven approach for describing nonlinear reaction behaviour. The experimental validation at the optimized conditions confirmed the practical feasibility of the developed catalytic process.

The study demonstrates the potential of SAF as a sustainable solid acid catalyst for microwave-assisted esterification. RSM modelling enabled systematic optimisation of the reaction parameters and identification of suitable operating conditions. Under optimised conditions of 90 °C, 10 min, and a substrate-to-catalyst ratio of 5:1, the reaction achieved 95% conversion and 89% ester yield. The short reaction time and high conversion demonstrate the effectiveness of combining a waste-derived heterogeneous catalyst with microwave irradiation. The proposed approach provides a promising strategy for fly ash valorisation and development of more sustainable esterification processes.

Keywords: Esterification; Acid-treated fly ash; Solid acid catalyst; RSM and ANN Modelling; Waste valorisation; Microwave irradiation



Development and Evaluation of Bioplastic Formulations from Metroxylonsagu Starch

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Abstract:

The present research focused on use of Metroxylonsagu (sago) starch as the primary polymer to obtain bioplastic films. Sago starch was used due to its renewable nature, availability, and high starch content that includes amylose and amylopectin, providing good film-forming characteristics. The tensile strength of the material was studied to determine the ability of the films to resist stretching and mechanical forces. The addition of plasticizers to the film had an effect on the strength and flexibility of the material. The bioplastic that was synthesized exhibited properties such that it could be used as an alternative to regular petroleum-based plastics.

Methodology:

- **Extraction of Starch from Sago:** Transfer the washed sago into beaker and add 800-1000ml distilled water. Leave it to soak for 4-5hours. Filter the slurry through muslin cloth into clean beaker. The dried starch is then crushed into a fine powder using a mortar and pestle. It is stored in an airtight container at room temperature to avoid moisture absorption.

- **Formulation of Bioplastic:** Different combinations of bioplastic with sago and additives like acetic acid, chitosan, agar- agar, and glycerine to develop the bioplastics result in an improvement in mechanical strength, hydrophobicity, and environmental friendliness of the developed materials compared to conventional plastics.
- **Biodegradability Test:** Cut the bioplastic samples film into pieces of 2×2 cm. Weigh the dried sample and record its initial weight (W_1). Bury the bioplastic samples approximately deep in the soil. Leave the samples buried for selected period, such as 15 days. Carefully take the samples out and remove the soil particles from the samples without damaging them. Weigh the dried sample and record it as W_2 . Calculate the biodegradability percentage using formula: $W_1 - W_2 / W_t \text{ of sample} \times 100$
- **Tensile Strength Test:** Tensile strength is the maximum pulling force that a bioplastic film can withstand before it breaks. It indicates the strength and durability of the bioplastic. Tensile strength measures in MPa (megapascal) or N/mm^2 . Cut the bioplastic film into a standard rectangular strip. Measure its length, width, and thickness. Place the strip (film) between the grips of a Universal Testing Machine (UTM). Record the maximum force (N) at which the film breaks. Calculate tensile strength using formula: $\text{Tensile Strength} = \text{Maximum Force} / \text{Cross-sectional Area}$

Conclusion: The present study successfully demonstrated the formation of biodegradable bioplastic films using sago starch as the main polymer. Sago starch was combined with chitosan, acetic acid, glycerol, sorbitol, and agar-agar to improve the flexibility, strength, film-forming ability, and overall properties of the bioplastic. The prepared films showed good film formation and can serve as a potential alternative to conventional petroleum-based plastics.

Keywords: Sago Starch, Bioplastic, Biodegradability, Mechanical Strength, Solubility



Diagnostic Challenges of Artificial Intelligence in Pathology and Radiology: A Healthcare Perspective

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Abstract:

Artificial intelligence (AI) has emerged as a transformative technology in modern healthcare, particularly in the fields of pathology and radiology, where accurate and timely diagnosis is essential. AI-based tools have demonstrated significant potential to improve diagnostic accuracy, streamline clinical workflows, and support medical decision-making. Despite these advantages,

several challenges continue to limit their widespread adoption. This research examines key diagnostic challenges associated with AI, including issues related to data quality, model generalizability, interpretability of results, and hardware constraints. It also discusses important ethical mapping and regulatory concerns, such as algorithmic bias, accountability, and transparency in clinical practice. Furthermore, the paper explores potential strategies to address these limitations, including the standardization of AI algorithms, enhanced data-sharing frameworks, explainable AI techniques such as saliency mapping, adversarial training methods, and the use of cloud, edge, and hybrid computing architectures. The review also emphasizes the importance of fostering effective collaboration between healthcare professionals and AI systems. Addressing these challenges is crucial for ensuring the safe, reliable, and ethical integration of AI into pathology and radiology, ultimately leading to improved patient outcomes and quality of care.

Keywords: Artificial intelligence, Diagnostic Challenges, Algorithms, Cloud Computing



Isolation, Identification and Characterization of Amylase Producing Microorganism in Soil

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Abstract:

Amylase has been widely used as an enzyme for many decades now. It hydrolyses starch molecules to glucose units and oligosaccharides. α -amylase has widely been used in the food, textile, baking and detergents industries hence it is the type of amylase that is frequently used. The enzyme is obtained from microbes, plants and animals. From among the listed sources above, microorganisms are considered major producers of the enzyme because of their fast growth rate, ease of cultivation and ability to secrete enzymes. The aim of this study was to isolate, identify and characterize the amylase enzyme produced by microorganisms. The microorganisms producing amylase were identified through starch hydrolysis test done on the agar plates. The microbes that had the largest zone of clearance were isolated and used in production and characterization of amylase enzyme. *Bacillus subtilis* was isolated using methods such as colony, culture, staining and biochemical tests. The microorganisms produced amylase enzyme using submerged fermentation method. The amylase activity was determined using 3,5-dinitrosalicylic acid (DNS) method. The enzyme was centrifuged and partially purified using ammonium sulfate. *Bacillus* amylase produced the highest quantity of amylase at 40°C and pH 6.5.

The crude amylase enzyme has many applications in the detergent industries. This study has shown that the soil microorganisms can act as a good source of extracellular amylase and economic sources

of industrial enzymes. From the experiment, it has been established that the soil microflora can act as a major source of extra-cellular amylase enzyme and this enzyme would be useful in industrial application. The enzyme activity depended on the environmental conditions such as temperature and pH. The optimal conditions have been established to determine the best conditions for high enzyme activity. The partially purified enzyme possessed encouraging characteristics that could be studied further and may prove useful in industries dealing with starch processing. In conclusion, this study highlights the importance of microbial amylase as an important biotechnological product.

Keywords: Amylase, Enzyme, Submerged fermentation, 3,5-dinitrosalicylic acid technique, Ammonium sulfate.

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Linear Programming Applications for Profit Optimization in Operations Research

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Abstract:

Linear Programming (LP) remains a core mathematical approach within Operations Research (OR) for streamlining resource distribution under real-world operational constraints. This paper evaluates practical LP applications aimed at enhancing enterprise profitability across diverse managerial settings. A unified framework covering single- and multi-product LP models was constructed to maximize net revenue. The formulations account for operational bottlenecks, including raw material limits, equipment capacity, workforce availability, and market bounds. Solutions were generated using Graphical and Simplex computational methods. Post-optimality and sensitivity analyses were performed to assess how fluctuations in resource availability (right-hand side values) and profit margins (objective function coefficients) impact stability. Shadow prices were calculated to determine the economic value of acquiring additional constraint units. A practical manufacturing case study illustrates the actionable deployment of these models for optimal product-mix selection. The findings confirm that structured LP modelling significantly improves decision-making efficiency and profit margins in production, logistics, and supply chain management.

Keywords: Operations Research, Linear Programming, Profit Optimization, Simplex Method, Sensitivity Analysis.

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Polyherbal Antidiabetic Transdermal Patch Using Selected Antidiabetic Plants

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Abstract:

Diabetes mellitus, especially type 2 diabetes, calls for long-term treatment and continuous control of blood glucose levels, since oral administration can lead to degradation in the gastrointestinal tract, first-pass metabolism, variable drug concentrations, and difficulties in patient compliance. The current study was carried out with the aim of formulating and assessing a polyherbal anti-diabetic transdermal patch containing aqueous extracts of the seeds of *Syzygium cumini* (Java plum), the leaves of *Stevia rebaudiana*, and *Psidium guajava* (guava) as an alternative method for the controlled delivery of bioactive compounds derived from plants. The plant materials were dried, ground into a powder, and extracted by decoction with distilled water. The extracts were then tested qualitatively for phytochemicals and subjected to a DPPH radical-scavenging assay. The phytochemical analysis revealed the presence of a number of bioactive groups, such as anthocyanins, flavonoids, phenolic compounds, terpenoids, saponins, steviosides, rabaudiosides, carbohydrates, and reducing sugars.

The aqueous extracts showed antioxidant activity with the highest DPPH scavenging capacity being 82.38% for Java plum, 83.54% for Stevia, and 81.85% for guava at the most diluted concentration tested. Transdermal patches were made using chitosan and included PEG and glycerol as plasticizer, and were examined for their physicochemical, mechanical, drug-content, stability, and in vitro release properties. The different formulations had a fairly uniform appearance, with a surface pH between 4.41 and 5.57, a moisture content of 3.73–4.02%, and were found to be stable at 4°C, 25°C, and 35°C. Analysis of the drug content by UV spectroscopy showed that the extracts had been successfully incorporated, and the release studies indicated a gradual change in absorbance over a 24-hour period, which suggests a sustained release of the herbal components. The formulations had an average drug content of about 31.96 mg/mL and achieved a cumulative drug release of approximately 68% over 24 hours. The results show that it is feasible to develop a polyherbal transdermal formulation and lay the groundwork for further optimization, permeation studies, preclinical evaluation, and clinical validation.

Keywords: Polyherbal, diabetes mellitus, transdermal patch, antioxidant activity, In-vitro drug release.



Pharmacognostical Quality Assessment of Fenugreek Seeds (*Trigonella foenum-graecum* L.)

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Abstract:

Pharmacognosist is the scientific study of medicine derived from timber, and study of the surface activity, metabolic pathways, enzyme interaction, physicochemical properties on the drugs due to fibers, protein, manganese, magnesium, and iron. Physical assessment of *Trigonella foenum-graecum* seed was done by using powder, seed, leaf behaviourism, gleam study, material characterization appraise of organic substance, perseverance, phytochemical identification when extracted with *Trigonella foenum-graecum* is cultivated in a seed and leaf form and commonly used in healthcare, cosmetics, and gut health. Additionally, it is utilized in unconventional medicine to treat conditions like Diabetes mellitus, blood cholesterol, Menstrual cramps, and digestive issues. pharmacognostical study is included in detection of taste, medical assessment and physical and chemical evaluation characterization of *Trigonella foenum-graecum* seed. Sensory evaluation based on savour, shade, structure, manifestation and surface acceptable solvent. Outer shell made up of a thick layer of palisade like sclerenchyma fiber. The seeds are minor in size, diamond in shape, fallow in color, which had a nuanced bitter flavor. These pharmacognostical evaluations provide data for resemblance and serve as a basis for the quality satisfaction of *Trigonella foenum-graecum* in traditional and phytomedicine formulation. The diverse technical report showed that Fenugreek is known for its high blood sugar, disinfection, joint pain, and digestion. It is used as a medicinal herb. It can also generate thyroid dysfunction, turgidity and dysentery. The results of the study offer a crucial foundation for the progress, uniformity, and quality control of herbal medicines made from fenugreek.

Keywords: Gastronomy, Traditional, Diabetes, Menstrual Cramps, Phytomedicine.



AI-Driven Nanomedicine: Innovations in Therapeutic Design and Precision Healthcare

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Abstract:

Artificial intelligence (AI) has become a game-changing technology in nanomedicine that offers creative ways to get beyond the drawbacks of traditional nanoparticle structure, drug transport, diagnostics, and customized treatment. In order to administer therapeutic and diagnostic substances in a focused and regulated manner, nanomedicine uses nanoscale materials such as lipid-based, polymeric, carbon-based, and inorganic nanoparticles. However, the use of nanomedicine in clinical practice is still difficult because of the complex nature of biological systems, unpredictable behavior of nanoparticles inside the body, differences in nanocarrier formulations, manufacturing problems, and differences between preclinical and clinical results. The combination of Artificial Intelligence (AI) and Machine Learning (ML) can help overcome many of these problems. AI and ML can quickly analyze large and complex datasets and help in the design and optimization of nanocarriers. They can also be used to predict important properties such as particle size, stability, biodistribution, pharmacokinetics, cellular uptake, and therapeutic effects. Advanced AI methods such as deep learning, reinforcement learning, graph neural networks, and quantitative structure–activity relationship (QSAR) models can help researchers develop better nanocarriers and design more personalized treatments for patients. AI can also improve the development of intelligent nanobiosensors, assessment of nanoparticle safety, understanding of protein corona formation, and adjustment of drug doses according to individual patient needs. However, some challenges still limit the use of AI in nanomedicine. These include differences in data, lack of standardized data, and difficulty in understanding how AI models make decisions, limited ability of models to work with new datasets, problems with reproducibility, ethical issues, and the absence of well-defined regulatory guidelines. New approaches such as federated learning, explainable AI, standardized data-sharing systems, and proper experimental validation can help overcome these challenges. These developments may make AI-based nanomedicine safer, more reliable, and more useful for personalized healthcare.

Overall, AI-enabled nanomedicine offers a significant shift from empirical trial-and-error methods to precision-based, predictive, and personalized healthcare. Transforming these technological advancements into safe, efficient, and clinically practical nanomedicine solutions will require ongoing interdisciplinary cooperation between computational scientists, nanotechnologists, pharmaceutical researchers, clinicians, and regulatory agencies.

Keywords: Artificial Intelligence, Machine Learning, Nanomedicine, Drug Delivery, Healthcare.



Determinants of Bed Turnaround Time and their Impact on Hospital Operational Efficiency: A Retrospective Study

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Abstract:

Bed management is essential for an efficient hospital stay. Beds need to be prepared in the most optimal manner for faster patient turnover and easier transition from one procedure to another. Bed turnaround time is defined as the time it takes to prepare a bed for the next occupant. Therefore, factors that may delay the discharge of a patient, preparation of the bed, transfer of a patient to another bed, staff availability and communication, as well as admission to the hospital, contribute to the length of the turnaround time. In addition, poor communication and manual updating of the status of beds can also interfere with the proper bed management. The present study attempts to identify the various determinants of Bed Turn Around Time (TAT) which eventually influences the overall hospital operational efficiency. The present study is a secondary research, based on various research papers, articles and published literature. The paper is a review compilation of last two decades study on the determinants of Bed TAT which eventually influences hospital's operational efficiency, which has been carried out by various researchers.

Findings indicate that the Bed Turnaround Time (TAT) is a multifaceted inpatient activity, which involves a set of associated discharge-bed preparation procedures. Constraints identified in the reviewed literature include financial clearance, nursing discharge, billing and TPA clearance, doctor's rounds, nursing update, pharmacy, preparation of discharge summary, transportation, and housekeeping. The earliest works focus on length of stay (LOS), discharge timing, bed occupancy, and admission rates, with discharge timing influencing hospital bed availability. The body of literature on bed management emphasizes processes related to bed allocation, occupancy, transfers, and assignment. The application of dynamic bed assignment models is recommended to reduce emergency department boarding while accommodating differences in discharge timing. Forecasting of emergency department arrivals using machine learning and optimization techniques is considered to improve bed assignment. Discrete-event simulation is proposed to integrate surgical and emergency admission scheduling, bed capacity, occupancy, and LOS prediction to optimize inpatient bed capacity. The recent literature trends identify a shift toward real-time process improvement approaches, with the emergence of web-based hospital Bed Management Systems and associated information technology. Real-time bed availability information enables collaborative decision-making across departments and improves bed management practices.

Overall, the Bed TAT remains under-researched since most studies focus on separate processes. This study contributes to the body of literature by performing a literature review and proposing a set of evidence-based solutions, such as lounge beds, discharge red-flag tracking, QR codes for housekeeping logs, dashboards, discharge-rounding priority, and automated alerts. Therefore, Bed

TAT is a valuable process, which should be considered in a broader context of hospital operations to improve bed availability and occupancy while shortening patient access times.

Keywords: Bed Turn-Around-Time (TAT), Hospital, Healthcare, Hospital Bed Management, Operational Efficiency.

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Evaluation of Phytochemical Analysis, Antioxidant and Antibacterial Activity of Medicinal Plants *Prosopis cineraria* and *Cymbopogon citratus*

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Abstract:

Medicinal plants have been used in traditional medicines in India since ancient times for the management of various diseases and promotion of health. Their diverse phytochemical constituents and biological activities have made them important subjects of research in biotechnology and natural product science. These are now essential and foremost important topic for the research in Biotechnology due to their uses and benefits to the living beings. *Prosopis cineraria* commonly known as Khejri belongs to Leguminosae family. It is a multipurpose endemic tree commonly available in hot dessert areas of Rajasthan, India. It is used in ancient medicines as it contains several Phytochemicals and bioactive compounds that helps in biological function such as Anti-diabetic, Antimicrobial, Analgesic, Antibiotics etc. *Prosopis cineraria* contain several chemical constituents such as Protocatechuic acid, Chlorogenic acid, Ferulic acid, Gallic acid, Prosogerin, Luteolin etc.

Cymbopogon citratus commonly known as Lemongrass or Citronella grass belongs to Gramineae/Poaceae family. It is a medicinal and fragrant perennial tall grass with rhizomes and fibrous roots that are densely tufted. Citronella attracts a great interest due to its diverse and many pharmacological properties. It has several bioactive which dictate the anti-inflammatory, antiseptic, anti-dyspeptic, anti-fever effects etc. *Cymbopogon citratus* contains several chemical constituents such as Citral (principal compound of *Cymbopogon citratus*, a mixture of geranial/ α -citral and neral/ β -citral), Citronella, Linalool, Lutenol, Quercetin, Caffeic acid, p-Coumaric acid, Tannins, Saponins, Alkaloids etc. This particular Research paper has a purpose for the Evaluation of Phytochemical analysis, Antioxidant Activity and Antibacterial Activity of both plants. The plant extract was made by using Decoction method. The solvents used were different in each plant. *Prosopis cineraria* were extracted in Methanol. *Cymbopogon citratus* was extracted in Ethanol.

Different qualitative phytochemical analysis was done to determine the presence of these phytochemicals such as Alkaloids, Flavonoids, Saponins, Tannins and Terpenoids according to the phytochemical screening research paper. The phytochemicals found were then taken under the quantitative phytochemical analysis to determine the amount of this phytochemical is present in the plant individually. DPPH Radical Scavenging Assay was used to determine the Antioxidant activity of these plants. Antioxidant activity shows the defence mechanism of plants against oxidative stress caused by Harmful reactive oxygen species and environment pressure. This is done by calculating the value of the plant oxidation shows against DPPH radical scavenging assay. The amount of this is evaluated against the amount of oxidative stress shown by Ascorbic acid which is taken as the standard value for the calculation of Antioxidant activity. This value is taken in UV-Vis Spectrophotometer.

Antibacterial activity of these plants was done to evaluate the plants resistance against several bacteria. This is done by agar well diffusion method in which the agar plate is inoculated with certain bacterial lawn (*B. subtilis*) and then making a small well in the middle of the lawn and impregnating the well with the plant extract. When incubated the bacterial colony will grow but the plant extract will resist the growth of the bacteria. This antibacterial activity will then be assessed by the formation of Zone of Inhibition of which the radius is calculated and is determined that how much resistance did the plant showed against certain bacteria. Phytochemical constituents in qualitative analysis such as Alkaloids, Flavonoids, Terpenoids, Tannins and Saponins were found in the plant extract of *Prosopis cineraria* and *Cymbopogon citratus*. Which were then taken under the quantitative analysis to determine the amount of these certain phytochemicals present in the sample.

Antioxidant activity of *Prosopis cineraria* and *Cymbopogon citratus* was measured against Ascorbic acid which was taken as a standard. It was measured on Spectrophotometer and a graph was plotted of the same. Which tells us how well these extract stops cell damage over time or at different amounts. Antibacterial activity of *Prosopis cineraria* and *Cymbopogon citratus* tells us that how much bacterial resistance both the plant shows. Which can be taken as how much the plant can have a shelf life of because the more the antibacterial resistance the less it has chances of degradation due to bacteria.

The present study demonstrates the identification of the presence of individual bioactive compounds in both the plants and the amount of these compounds present. Advanced techniques can be used for a detailed characterization. The antioxidant of these plants protects the human beings from the damage caused by free radicals. The antibacterial property of these plants tells that how these plants protect them from bacteria present in the environment. The zone of inhibition tells the effectiveness of the antimicrobial in inhibiting microbial growth. The size of the zone can be used to determine the susceptibility of a bacteria to the plant concentration. The conclusion of this research tells the components, their amount and antioxidant and antibacterial activity of *Prosopis cineraria* and *Cymbopogon citratus*.

Keywords: *Prosopis cineraria*, *Cymbopogon citratus*, Phytochemical analysis, Antioxidant activity, Antibacterial Activity, Anti-diabetic, Analgesic, Antibiotics, DPPH



In vitro and in Silico Molecular Docking on Bioactive Compounds from Indian Medicinal Plant *Trigonella foenum-graecum* Against Digestive Enzymes: A Computational Approach

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Abstract:

Natural chemical compounds obtained from medicinal plants are increasingly explored for the management of diseases and disorders due to their therapeutic potential and comparatively fewer side effects. The current study was aimed at evaluating the antidiabetic potential of *Trigonella foenum-graecum* (fenugreek) using in vitro and in silico approaches. The ethanolic extract of *T. foenum-graecum*, a plant traditionally used in Indian medicine for diabetes management, was investigated for its biological activities using different in vitro assays. Additionally, bioactive compounds identified from the fenugreek extract through GC-MS analysis were subjected to molecular docking to investigate their interactions with digestive enzymes involved in glucose metabolism, including trypsin, pepsin, and peptidase. The molecular docking studies revealed strong binding affinities and favourable interactions of 9(E),11(E)-Conjugated linoleic acid and 2-hydroxy-1-(hydroxymethyl) ethyl compounds with the targeted enzymes. These findings indicate the potential of the identified phytocompounds as promising antidiabetic agents. Overall, the study supports the therapeutic potential of *Trigonella foenum-graecum* and its bioactive constituents as potential candidates for the development of natural antidiabetic treatments.

Keywords: Fenugreek, Diabetes, Phytochemical, Anti-oxidant, Anti-diabetic, Molecular docking, in-silico approach

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The Optimized Analysis for Early Detection of Skin Cancer using Artificial Intelligence

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Abstract:

Skin cancer is the most common cancer worldwide and can be life-threatening if not found and treated early. Catching it early is crucial for effective treatment and better results. Artificial Intelligence (AI) is becoming a valuable tool for detecting skin cancer at an early stage. AI

algorithms can help improve the accuracy of diagnoses by using automated image analysis methods like pattern recognition and machine learning. These AI systems also allow people without specialized training to evaluate the risk of skin cancer by classifying and analyzing images. Additionally, AI can automate tasks such as examining biopsy samples, which leads to faster and more accurate diagnoses. When combined with traditional tools, AI offers a more affordable and efficient way to screen and diagnose skin cancer in healthcare settings. This helps reduce the impact of skin cancer on both individuals and healthcare systems.

Keywords: Skin Cancer, Early Detection, Machine Learning, Artificial Intelligence, Pattern Recognition

Introduction: The potential of Artificial Intelligence (AI) to revolutionize how individuals protect themselves from skin cancer lies in its ability to detect the disease at an early stage. In the United States, skin cancer is the most frequently diagnosed form of the disease, with an estimated 3.5 million cases of non-melanoma skin cancer occurring each year. Furthermore, the incidence rate of the deadly melanoma has more than doubled over the past 30 years, reaching an estimated 78,560 cases in 2021. For many types of cancer, including skin cancer, early detection is crucial for survival [1]. However, the accuracy of human skin cancer diagnosis relies heavily on the diagnosing physician's expertise and their ability to correctly identify suspicious moles or skin lesions. In contrast, AI technologies can be programmed to identify and analyze skin lesions with an accuracy that far exceeds human capabilities. This creates a significant opportunity to detect skin cancer earlier and more accurately than is currently possible. The future of AI-driven early detection of skin cancer relies on computer vision algorithms and deep learning techniques [2]. These techniques can be trained to identify various characteristics of skin lesions, such as texture, color, and size, which can then be used to estimate the probability that a lesion is cancerous. This data can subsequently guide diagnostic decisions, potentially saving valuable time and resources. Another advantage of using AI for skin cancer detection is its potential to identify abnormalities that human doctors might overlook [3]. AI can identify suspicious patterns and subtle changes in skin lesions that might be challenging for a human doctor to detect. For example, a computer vision algorithm can be trained to detect rapid mole growth or irregular shapes, both of which may indicate skin cancer. In the future, AI can be integrated into consumer-facing products, such as smartphone applications and web-based platforms, to automate the early detection of skin cancer [4]. These applications could analyze a user's skin and offer feedback on which moles or spots warrant close monitoring. Leveraging AI for the early detection of skin cancer could fundamentally transform how individuals safeguard themselves against the disease. As AI technologies become more sophisticated, early detection of skin cancer will become increasingly accessible and easier to implement. Consequently, fewer individuals may receive a skin cancer diagnosis, as AI algorithms have become more capable of detecting and accurately identifying early signs of the disease. In recent years, artificial intelligence has made significant progress in the early detection of skin cancer. The advent of emerging technologies has expanded the horizons of medical science, enabling the development of more minimally invasive and highly precise diagnostic tools for skin cancer. The integration of machine learning algorithms with medical imaging has already demonstrated success in detecting skin cancer at earlier stages and is now being implemented in

dermatology clinics to deliver improved and earlier outcomes for patients. Historically, physicians primarily depended on visual examination of skin lesions to establish diagnoses [6]. However, as artificial intelligence and machine learning algorithms advance, the reliability of computer-aided detection and diagnosis for skin cancer has grown significantly. These systems can automatically identify abnormal skin lesions that could be cancerous or precancerous. By employing advanced imaging techniques like deep learning and machine learning algorithms, clinicians can accurately predict and detect potential skin cancer before it is identified through traditional clinical examination. By analyzing vast amounts of data, computer models are trained to identify potential skin cancer risks. This type of early detection enables physicians to treat skin cancer before it becomes a significant problem, thereby saving patients valuable time and money [7]. The construction diagram is shown in the following figure. 1.

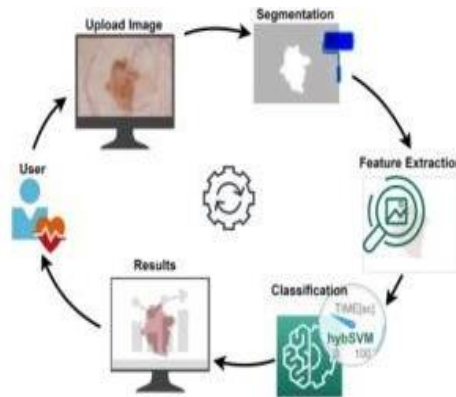


Fig 1: Construction Diagram

Moreover, deep learning algorithms have made it possible to diagnose skin cancer more accurately and sensitively than just looking at images manually. By combining high-definition imaging with machine learning, skin cancer can now be found earlier and more reliably. These advancements in technology mean more patients can receive the best care quickly, leading to better and earlier results. The use of artificial intelligence in skin cancer detection has changed how early diagnosis is done [8]. With greater accuracy and sensitivity, doctors can spot skin cancer sooner, giving patients better outcomes. In the future, these technologies will keep improving, helping to lower the death rate from skin cancer, even though it can be complex. The main contributions of the research are the following:

- **Automated Diagnosis:** AI systems can process large amounts of image data to detect skin cancer. This allows for faster and more accurate diagnosis than manual methods.
- **Real-Time Monitoring and Alerting:** AI can continuously monitor skin cancer and send alerts when changes are detected.
- **Increased Access to Detection:** AI-based systems make skin cancer detection available remotely or through autonomous scanning, helping people who might not otherwise have access.

- **Improved Risk Assessment and Prevention:** AI can better predict the risk of developing skin cancer, making prevention strategies more effective.
- **Cost-Effectiveness:** Automated systems reduce the cost of regular skin cancer screening and offer more accurate results than manual methods [9].

Proposed Model: Early detection of skin cancer with the help of artificial intelligence is a technology-based method that uses machine learning to spot changes in the skin that might signal cancer. The computer transforms visual images into numbers, which allows it to accurately sort and classify different skin lesion images. Because of this, AI can be used in electronic health records to help doctors give quicker diagnoses, treatments, and preventions. Additionally, AI models can clearly tell the difference between skin lesions and normal skin, which helps dermatologists spot possible cancerous areas faster. The functional block diagram is shown in Figure 2

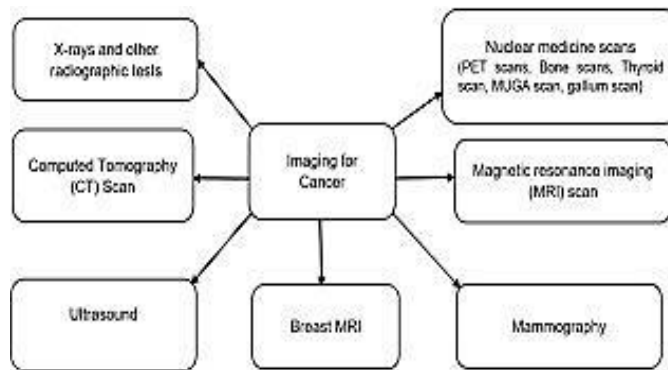


Fig 2: Functional Block Diagram

AI technology uses computer vision to closely look at skin images and find signs of cancer. These algorithms can spot patterns in the images that might point to cancer. By comparing these patterns with a big collection of images, the AI can tell which images are most likely to show cancer. Once suspicious areas are found, AI can make more accurate cancer type diagnoses by using computer vision along with other data like lab results, patient history, and other relevant information. With this extra data, the AI can give much more accurate diagnoses than traditional methods. Using AI for early skin cancer detection could greatly lower the number of cancer deaths by finding and treating the disease early. Early detection through AI can also help patients by reducing the time they have to wait for treatment. This can be life-saving if quick treatment is needed. AI has the potential to discover new treatments for skin cancer. By analysing a lot of digital information, the AI can find the best treatment options for each type of skin cancer. This can lower the cost of treatment and make the treatment process more efficient. The operational flow diagram has been shown in the following fig.3

Methodology: The operational flow diagram represents a deep-learning-based methodology for automated classification of thermoscopic skin-lesion images, particularly for distinguishing melanoma (MEL) from melanocytic nevi (NV). The methodology integrates image augmentation,

custom mini-batch processing, transfer learning, convolutional neural networks (CNNs), and binary classification.

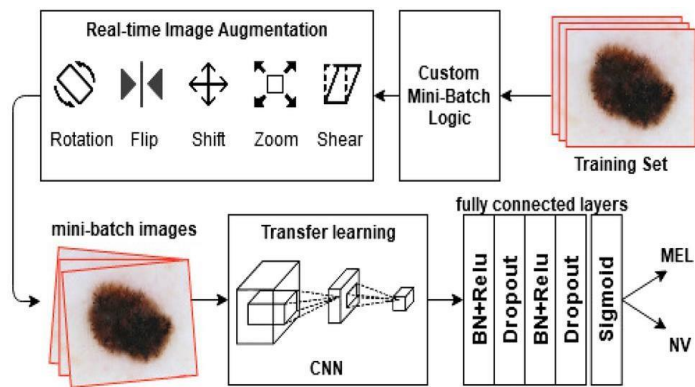


Fig 3: Operational Flow Diagram

Results and Discussion: Analysing the performance of AI in early skin cancer detection is a key step in developing an effective system for early diagnosis. AI models for skin cancer detection must be thoroughly tested to ensure accuracy and reliability. The performance of these models is typically evaluated using several metrics, like accuracy, sensitivity, specificity, recall, and precision. Accuracy shows how many predictions are correct, while sensitivity and specificity deal with how well the model identifies positive and negative cases. Recall and precision, on the other hand, help measure the number of true positives and false positives. It's also important to test how well an AI model works with different types of data. This is especially relevant when applying these models in real-world situations. Evaluating the model's performance in specific scenarios, like different weather conditions or among various patient groups, is crucial. The performance of AI models is largely influenced by the amount and quality of data used for training and testing. Models trained on large, diverse datasets usually perform better than those trained on smaller or less varied data. Similarly, models trained on high-resolution images tend to be more accurate than those using lower resolution images. It's also important to keep an eye on the model's performance over time. This is especially true for AI used in skin cancer detection. As new data, both healthy and cancerous, becomes available, it should be included in the training process to keep the model accurate. Regular testing and evaluation are necessary to prevent overtraining and to ensure that the model's performance doesn't decline over time. Detecting skin cancer early is a major medical challenge, as it is a leading cause of death in the United States. In recent years, AI has shown promise in automating and early detecting skin cancer. AI can quickly and accurately analyse large amounts of data at a lower cost, helping to reduce the complexity and cost of manual skin cancer detection. AI algorithms can examine radiographic images to create statistical and predictive models that help find unusual changes in skin tissues. These algorithms can also be used to divide specific parts of the skin to spot and categorize any suspicious spots. This process can involve a three-dimensional imaging method known as reflectance confocal microscopy, which produces detailed images of the skin and helps identify changes in its structure and makeup. AI can also be used to review images from biopsies or to look for patterns in patient data to predict the likelihood of skin cancer. Getting

the best performance from AI is essential for effective early detection of skin cancer and for making sure the models are accurate. To achieve this, AI algorithms should be trained on high-quality data sets that include examples of both positive and negative results from different groups of people. The overall comparison of performance is shown in figure 4.

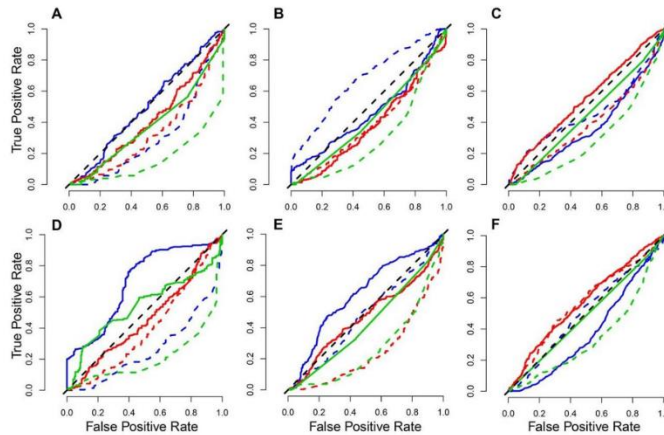


Fig.4: Overall performance comparison

This data should include medical images, patient features, and their results. Data sets should also be kept up to date, as changes in skin cancer screening techniques may affect the performance of existing AI entrained models. The evaluation of AI models for early skin cancer detection should be carried out using standard metrics, such as accuracy, precision, or sensitivity. Tests should be conducted over a number of data sets to assess the model's performance against different populations, environments, and data sets. The implementation of AI for early skin cancer detection has shown promise, and it can provide healthcare professionals with greater insight into the disease. To ensure optimal performance and accuracy, AI algorithms must be trained with high-quality data sets and tested with standard metrics. The main approaches to AI-based skin cancer detection include deep learning, computer vision, and machine learning algorithms. Each of these approaches employs different techniques to extract and interpret data, such as the classification of lesions from a photograph or biopsy sample, feature detection, and texture analysis. Deep learning typically employs convolutional neural networks (CNNs) and recurrent neural networks (RNNs) to analyse large images. With CNNs, images are presented to a computer algorithm that can detect features and classify lesions. Techniques such as segmentation and edge detection can be used to identify lesions in images. Machine learning algorithms are also used to detect and classify lesions and offer a more robust analysis of images compared to computer vision techniques

Conclusion: Early detection of skin cancer using Artificial Intelligence (AI) is a technology that uses a combination of machine learning, computer vision, and image analysis algorithms to detect and diagnose possible cases of skin cancer. AI-powered tools are able to examine a person's skin more accurately and with much greater speed than a human doctor or dermatologist can. The technology can identify abnormalities that are too small for the human eye to detect, and will alert

doctors to further investigate or take action. AI can also help identify patterns in the patient's medical history that may signal the need for further testing or treatment. AI can provide very accurate diagnoses and recommendations in a much shorter time frame than traditional methods. AI-assisted diagnosis can be an invaluable tool in reducing skin cancer mortality rates, especially in early detection before the disease spreads. The emergence of AI-driven technologies has made it easier and faster to detect early signs of skin cancer. By enabling automated analysis of digital images and the development of intelligent decision-support tools, AI has the potential to significantly improve the accuracy and speed of diagnosis for skin cancer. By leveraging the capabilities of AI to detect and diagnose skin cancer at earlier stages, medical professionals can take proactive steps to ensure that a patient is receiving treatment in a timely and appropriate manner.

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Women in Life Sciences as Catalysts of Innovation and Entrepreneurship in the Era of AI-Driven Transformation

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Abstract:

Women have played a pivotal role in advancing the life sciences through groundbreaking discoveries, scientific leadership, innovation, and entrepreneurship to tackle critical global challenges in health, biotechnology and sustainability. In the emerging era of Artificial Intelligence (AI), the combination of life sciences with digital technologies is creating new opportunities for women scientists as innovators and entrepreneurs to address complex global challenges. AI-driven approaches are transforming life sciences by enabling faster drug discovery, precision medicine, genomic analysis, disease prediction, advanced diagnostics, clinical decision-making and the development of innovative biotechnological solutions. By using AI translating scientific discoveries into transformative solutions, they are reshaping industries and creating impactful ventures. Moreover, AI can facilitate data-driven entrepreneurship by supporting market analysis, personalized healthcare solutions, automation and efficient research and development. This abstract explores the contributions of women scientists to scientific advancement, technology translation, startup development and interdisciplinary collaboration. Strengthening inclusive innovation ecosystems, AI literacy, mentorship networks and access to entrepreneurial resources can empower more women to lead the next generation of life-science innovations. The integration of women's scientific expertise with AI-driven technologies therefore represents a significant opportunity for building a more innovative and sustainable future for life sciences.

Keywords: Artificial Intelligence, AI-Driven Innovation, Entrepreneurship, Drug discovery, Biotechnology, Genome analysis

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Role of Artificial Intelligence in Research and Sustainable Agriculture

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Abstract:

In the life sciences and agriculture, artificial intelligence (AI) is quickly becoming a potent instrument that offers fresh perspectives on comprehending intricate biological systems and

enhancing farming methods. Biological research, plant science, and sustainable agricultural production have all benefited greatly from AI and machine learning's (ML) capacity to handle massive datasets, find links, spot trends, and produce predictions. AI can improve research productivity and promote evidence-based decision-making when combined with traditional scientific approaches. These methods are frequently used in biological research in the fields of genomics, molecular biology, microbiology, metabolomics, microscopy, and ecology. In addition to analyzing complicated datasets, machine-learning algorithms can help forecast biological reactions and interactions. Image-based AI systems can be applied to plant identification, growth tracking, morphological evaluation, and early detection of physiological stress and disease indicators. AI has potential uses in research related to microbial communities, microbial interactions may be predicted, and microorganisms with the potential to promote plant development can be found using computational models. Understanding the functions of beneficial microbes in nutrition uptake, stress tolerance, and biological disease control. These uses could lessen reliance on overuse of chemical pesticides and fertilizers and promote the development of sustainable microbial technologies.

The agricultural sector is also benefiting from the integration of AI with remote sensing and precision-farming technologies. Data collected through satellites, drones, soil sensors, weather stations, and field-monitoring devices can be analysed using AI to assess crop conditions and environmental changes. Machine learning models can support early detection of diseases, pest infestations, nutrient deficiencies, and water stress. Timely identification of these problems enables targeted management practices, potentially reducing unnecessary use of irrigation water, fertilizers, and pesticides. AI-based predictive systems can further improve irrigation and nutrient management by integrating information related to soil moisture, weather conditions, crop requirements, and historical field data. In conclusion, AI represents an important emerging technology for advancing life-science research and promoting sustainable agriculture.

Keywords: Artificial Intelligence, Sustainable agriculture, Machine learning, Biological Research.



Targeting Plasmid Maintenance Mechanisms to Cure Antimicrobial Resistance Plasmids in Multidrug-Resistant Enterobacteriaceae

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Abstract:

Antimicrobial resistance (AMR) among Enterobacteriaceae is a major global health concern, particularly because resistance genes are frequently carried on plasmids that can be transferred

between bacterial cells. Conventional antimicrobial therapies exert selective pressure that may promote the persistence and dissemination of these resistance determinants. Therefore, strategies that eliminate resistance plasmids without killing the bacterial host represent a promising alternative approach to AMR management. Plasmid maintenance depends on several essential mechanisms, including toxin–antitoxin (TA) systems, partitioning machinery, and plasmid replication and stability factors. Disruption of these mechanisms may destabilize resistance plasmids and promote their loss during bacterial growth.

The proposed study aims to investigate plasmid maintenance mechanisms in multidrug-resistant Enterobacteriaceae, with particular emphasis on TA systems and partitioning proteins involved in the stable inheritance of antimicrobial resistance plasmids. MDR isolates of clinically relevant organisms, including *Escherichia coli* and *Klebsiella pneumoniae*, will be characterized for their antimicrobial resistance profiles and plasmid content. Molecular and bioinformatic approaches will be used to identify plasmid maintenance-associated genes, while targeted inhibition or disruption of selected maintenance mechanisms will be evaluated for its ability to induce plasmid loss. Plasmid curing will be assessed through phenotypic resistance testing, plasmid profiling, and molecular confirmation of resistance gene elimination. The effects of plasmid destabilization on bacterial growth, viability, and fitness will also be examined to determine whether resistance can be reduced without substantial host-cell killing.

This research may provide valuable insights into plasmid biology and support the development of plasmid-curing strategies that reduce the persistence and dissemination of AMR determinants. By targeting resistance plasmid maintenance rather than bacterial survival directly, the study could contribute to novel approaches for managing MDR Enterobacteriaceae and preserving the effectiveness of existing antibiotics.

Keywords: Antimicrobial resistance, plasmid curing, toxin–antitoxin systems, partition machinery, MDR Enterobacteriaceae, plasmid stability, *Escherichia coli*, *Klebsiella pneumoniae*.



AI-Healthcare Systems with Traditional Medicine Integration

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Abstract

Healthcare combination of Artificial Intelligence (AI) with conventional medicine presents new possibilities to enhance healthcare systems by merging contemporary technological innovations with established medical wisdom. AI technologies, including machine learning, natural language processing, and predictive analytics, hold the promise of facilitating disease diagnosis, treatment

planning, patient monitoring, and tailored healthcare. Traditional medicinal systems, such as Ayurveda, Traditional Chinese Medicine, and various indigenous healing practices, offer important insights into medicinal plants, holistic health, and preventive disease management strategies. Merging these traditional methods with AI-enhanced healthcare systems could enable the organized documentation, analysis, and scientific assessment of traditional medical wisdom. AI-driven tools may help in uncovering medicinal plant compounds, forecasting potential therapeutic benefits, and assessing possible interactions between traditional remedies and modern treatments. Nevertheless, successful integration requires reliable clinical evidence, standardized data, ethical considerations, and careful validation of AI-generated recommendations. Issues related to data privacy, cultural sensitivity, safety, and the preservation of indigenous knowledge must also be addressed. This paper explores the potential applications, benefits, challenges, and future prospects of AI-integrated traditional medicine in developing more personalized, accessible, and evidence-based healthcare systems. The integration of AI and traditional medicine may contribute to a more comprehensive approach to healthcare while ensuring that traditional knowledge is evaluated responsibly and applied alongside scientifically validated medical practices.

Keywords: Artificial Intelligence, Traditional Medicine, Healthcare Systems, Ayurveda, Machine Learning, Personalized Medicine, Digital Healthcare.



Climate Change and Biodiversity Conservation in the Aravalli Landscape: The Role of Artificial Intelligence

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Abstract

Climate change is increasingly affecting biodiversity through changes in temperature, precipitation, habitat suitability, species distribution and ecological interactions. These impacts become more complex in fragmented landscapes where climate stress occurs together with urbanisation, infrastructure development, habitat degradation and other anthropogenic pressures. The Aravalli landscape of north-western India represents an ecologically important mountain system that supports diverse habitats and wildlife while experiencing increasing human pressure. Effective conservation therefore requires continuous monitoring at both species and landscape scales. Artificial Intelligence (AI), including machine learning, deep learning, automated image recognition, acoustic analysis and remote sensing, provides new opportunities for biodiversity assessment and conservation planning. This review synthesises published literature on climate change, biodiversity conservation and AI-based ecological monitoring, with particular emphasis on the Aravalli landscape. AI-assisted camera-trap analysis can improve wildlife detection, while

acoustic models can support monitoring of species that are difficult to observe directly. Integration of satellite imagery, climatic variables and biodiversity observations can further assist habitat suitability and ecological-connectivity assessment. However, model accuracy depends on data quality, regional validation and ecological interpretation. An integrated field-based and AI-assisted framework is proposed for climate-resilient biodiversity monitoring in the Aravallis. Such integration can strengthen evidence-based conservation while retaining field ecology as the foundation of reliable biodiversity assessment.

Keywords: Aravalli; climate change; biodiversity conservation; artificial intelligence; wildlife monitoring



A Review on the Antibacterial Activity of Clove Against *Bacillus subtilis* and *Escherichia coli*

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Abstract

Clove (*Syzygium aromaticum*) is a widely used spice that has attracted scientific interest because of its antimicrobial and other biological properties. The dried flower buds contain several bioactive compounds, with eugenol being one of the major constituents associated with antimicrobial activity. Bacterial contamination is an important concern in food, environmental and laboratory settings, and plant-derived substances are being studied as possible sources of natural antibacterial agents. *Bacillus subtilis* is a Gram-positive bacterium, whereas *Escherichia coli* is a Gram-negative bacterium. Their different cell-envelope structures may influence their response to clove-derived compounds. This review summarizes available information on the antibacterial activity of clove against these two bacterial species and considers factors that can influence the observed activity.

Published scientific literature concerning clove, clove extracts, clove essential oil, eugenol, *B. subtilis* and *E. coli* was reviewed. Attention was given to studies using commonly applied antibacterial tests, including agar well diffusion, disc diffusion and minimum inhibitory concentration (MIC) measurements. The review also considered the influence of extraction solvent, concentration, bacterial strain and experimental conditions on antibacterial performance. Reported observations were compared descriptively rather than treating results from different experimental designs as directly equivalent.

The reviewed literature indicates that clove preparations can inhibit the growth of both *B. subtilis* and *E. coli*, although the magnitude of inhibition differs among studies. Clove essential oil and extracts contain eugenol and other phenolic constituents that may contribute to antibacterial effects.

Proposed actions include interaction with the bacterial cell membrane, alteration of membrane permeability and interference with essential cellular processes. Gram-positive and Gram-negative bacteria do not always respond in the same way, and therefore a difference in inhibition between *B. subtilis* and *E. coli* may occur. Concentration is another major factor: stronger preparations may produce larger inhibition zones or lower MIC values, but such measurements depend on the test system and cannot be compared without considering the experimental method. The type of plant material, extraction procedure and chemical composition of the resulting preparation can also affect activity. These findings support continued investigation of clove as a source of natural antibacterial compounds, while highlighting the need for standardized laboratory procedures.

Clove shows promising antibacterial potential against both *B. subtilis* and *E. coli*. Eugenol and other bioactive constituents are likely to contribute to this activity, but the strength of the effect depends on several experimental and chemical factors. Further work using standardized extracts, clearly defined concentrations and reproducible antibacterial assays is needed to establish reliable comparisons and better understand the mechanism of action. The available evidence supports the value of clove for further study in natural antimicrobial research, including possible applications in food preservation and microbiological investigations.

Keywords: Clove; *Syzygium aromaticum*; Eugenol; Antibacterial activity; *Bacillus subtilis*; *Escherichia coli*

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Anti-inflammatory Activity of Ethanolic Leaf Extract of Tulsi

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Abstract:

Tulsi (*Ocimum sanctum*, also known as *Ocimum tenuiflorum*) is a medicinal plant widely studied for its diverse biological properties. Its leaves contain several naturally occurring phytochemicals, including phenolic compounds, flavonoids and other constituents that may contribute to antioxidant and anti-inflammatory effects. Inflammation is a protective biological response, but prolonged or excessive inflammation can contribute to tissue damage and several chronic conditions. Plant-based extracts are therefore being investigated as potential sources of compounds with anti-inflammatory activity.

This review focuses on the reported anti-inflammatory potential of ethanolic extracts prepared from Tulsi leaves. Relevant studies describing extraction of leaf material with ethanol and assessment of anti-inflammatory activity were considered. Common experimental approaches used in this area include inhibition of protein denaturation, membrane stabilization, inhibition of inflammatory

mediators and other in-vitro models. Attention was given to the concentration of extract, extraction conditions and assay method because these factors can influence the observed activity. The available findings were considered descriptively to understand the overall potential of the ethanolic leaf extract.

Studies on Tulsi indicate that ethanolic leaf extracts can show measurable anti-inflammatory activity in laboratory models. The activity is generally associated with the presence of bioactive phytochemicals such as eugenol, rosmarinic acid, flavonoids and other phenolic constituents. These compounds may influence pathways involved in inflammatory responses and may also provide antioxidant effects that are relevant to inflammation. Experimental findings commonly show that the inhibitory effect varies with extract concentration and the method used for evaluation. Ethanolic extraction may help recover a range of moderately polar bioactive compounds from the leaves. However, results obtained from different studies should be compared carefully because plant variety, growing conditions, extraction procedure, solvent concentration and assay conditions can alter the chemical composition and biological response. In-vitro activity provides useful preliminary evidence, but it does not by itself establish clinical effectiveness in humans. Further research using standardized extracts and well-defined experimental models is needed to identify the active constituents and clarify their mechanisms of action.

The available evidence suggests that the ethanolic leaf extract of Tulsi has promising anti-inflammatory potential. Its phytochemical constituents may contribute to inhibition of processes associated with inflammation. Standardized extraction methods, concentration-dependent studies and additional biological investigations are needed to establish the activity more reliably. Tulsi therefore represents a useful plant material for further research into natural anti-inflammatory agents.

Keywords: *Ocimum sanctum*; Ethanolic leaf extract; Anti-inflammatory activity; Phytochemicals



Artificial Intelligence for Protein Structure Prediction and Protein Engineering: An Emerging Paradigm Shift in Protein Science

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Abstract:

Proteins are essential biomolecules that determine a variety of cellular functions; their three-dimensional structure is often related to their functional role. Protein structure prediction and protein

engineering are typically difficult and time-consuming processes. Recent innovations in Artificial Intelligence (AI) empower computational chemistry and structural biology to address these challenges by enabling fast but highly accurate predictions of protein structure and function. AI-driven methods can identify patterns in amino-acid sequences, predict protein-protein and protein-ligand interactions, and elucidate biological mechanisms. Notably and other similar algorithms have contributed to an unprecedented increase in our capacity to predict protein structures.

In addition, AI can be leveraged to engineer protein structures and facilitate protein design. For instance, machine learning can be used to recognize patterns in amino-acid sequences and structures, which can then be used to identify beneficial mutations that improve a protein's stability, functionality, or specificity. Generative AI can also be utilized in conjunction with protein language models to propose new protein sequences, resulting in unprecedented opportunities in enzymology, therapeutics, biotechnology, and related fields. Nevertheless, there are still significant limitations and barriers to overcome, such as the availability of experimental data, prediction accuracy, model interpretability, and computational performance, among others. This paper focuses on the basic principles and recent advances in AI-driven protein structure prediction and protein engineering while commenting on current limitations and opportunities that lie ahead.

The present review was conducted by performing a literature search and data extraction from the selected articles that focused on the application of Artificial Intelligence (AI) for protein structure prediction and protein engineering. The manuscripts were retrieved from databases and publications by searching keywords such as artificial intelligence, machine learning, deep learning, protein structure prediction, protein engineering, protein design, protein language models, and generative AI.

The articles that were retrieved were screened based on their titles and abstracts for inclusion criteria. The inclusion criteria comprised of manuscripts that discussed AI-based protein structure prediction and analysis, protein-protein interactions, mutations, and designs. The research articles and reviews that discussed and compared the leading techniques, tools, and approaches such as AlphaFold and other machine learning-based tools were included for the present review. The key information was extracted from the included articles and organized based on the following themes: (i) AI-based approaches for protein structure prediction, (ii) AI-based analysis of protein sequences and functions, (iii) In-silico identification of beneficial mutations, (iv) AI-based design of protein sequences, and (v) applications and limitations. The data was qualitatively compared and synthesized to highlight the key findings and trends in the field. The critical findings comprised of the need for validating the AI-predicted and designed protein sequences and structures experimentally and the emergence of AI-based engineering and design of proteins for various applications.

Artificial intelligence is becoming an increasingly powerful tool in modern peptidology and protein biology, enabling unprecedented opportunities for studying the structure of biomolecules, screening and analyzing protein sequences. The described approaches allow researchers to complement traditional strategies and techniques with highly efficient computational methods that are based on machine learning algorithms and generative models. In particular, predictive methods allow for

rapid and reliable characterization and identification of promising protein structures by computer. At the same time, learning-based algorithms open up the possibility of exploring new amino acid sequences with the desired properties.

Keywords: Artificial Intelligence, Protein Structure Prediction, Protein Engineering, Deep Learning, Protein Design, Machine Learning, Generative AI.

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Advanced Therapeutics and Global Health: The Power of Collaborative Pathways

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Abstract:

The rapid advancement of medical sciences and therapeutic interventions presents unprecedented opportunities to improve global health outcomes. However, achieving global wellbeing requires more than technological innovation; it demands collaborative pathways that integrate diverse disciplines, sectors, institutions, and stakeholders. Contemporary health challenges are complex and multidimensional, requiring coordinated approaches that combine scientific innovation, effective healthcare systems, equitable access, and sustainable public health strategies. Advanced therapeutics, including genomics, personalized medicine, artificial intelligence, and regenerative medicine, are transforming healthcare by enabling targeted therapies, precision treatments, improved disease management, and early diagnostic capabilities.

This abstract presents a conceptual and integrative overview of collaborative pathways that support the development, implementation, and equitable distribution of advanced therapeutics for global wellbeing. It emphasizes interdisciplinary cooperation among academic and research institutions, biotechnology and pharmaceutical industries, healthcare providers, governments, global health organizations, and non-governmental organizations. The approach connects scientific research, technological innovation, clinical application, public health policy, and social determinants of health to identify comprehensive and sustainable healthcare solutions. Particular attention is given to mechanisms that facilitate knowledge sharing, technology transfer, regulatory coordination, clinical translation, and wider access to innovative treatments across different populations and regions.

Collaborative partnerships play a critical role in translating laboratory discoveries into effective real-world applications. Academic institutions contribute fundamental research and scientific expertise, while biotechnology companies facilitate technological development, innovation, and therapeutic production. Healthcare providers support clinical implementation, evidence-based practice, and patient-centered care, whereas governments establish regulatory frameworks, allocate

resources, and promote equitable access. Global health organizations and non-governmental organizations further address disparities in healthcare delivery, particularly in low- and middle-income countries. The integration of advanced therapeutics with public health strategies can strengthen prevention, diagnosis, treatment, rehabilitation, and long-term disease management. Nevertheless, global wellbeing is also influenced by broader social, economic, and environmental determinants, including access to clean water, nutrition, education, sanitation, healthcare infrastructure, and financial security. Therefore, technological progress alone cannot ensure improved health outcomes unless supported by inclusive policies, ethical frameworks, sustainable financing, skilled human resources, and strong collaborative systems. International cooperation is particularly important for sharing research, reducing duplication, strengthening health systems, and ensuring that innovations reach underserved communities without creating additional inequalities.

Collaborative pathways are essential for maximizing the potential of advanced therapeutics and promoting global wellbeing. Partnerships across scientific disciplines, healthcare sectors, industries, governments, and international organizations can accelerate discovery, improve clinical translation, and support efficient and equitable distribution of transformative therapies. Such collaboration can reduce health disparities, strengthen healthcare systems, and expand access to life-saving interventions. A holistic approach that integrates advanced therapeutics with public health initiatives and addresses broader determinants of health is necessary for sustainable progress. Continued investment in research, capacity building, ethical governance, international cooperation, and inclusive healthcare policies will help ensure that scientific innovations benefit diverse populations. By combining technological advancement with collective responsibility and equity, the global community can build a healthier, more resilient, and prosperous future for all across generations, communities, and geographic boundaries worldwide.

Keywords: Advanced Therapeutics; Global Wellbeing; Collaborative Healthcare; Personalized Medicine; Health Equity.



AI-Guided Crop Genome Editing

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Abstract:

Agriculture plays an important role in meeting the food needs of a growing population, but crop production is being affected by many problems such as climate change, drought, high temperature, poor soil quality, pests, and plant diseases. Conventional methods of crop improvement can take many years because plants have to be selected and grown through several generations. Genome editing has provided a faster way to make specific changes in the genetic material of plants. Among

the different genome editing methods, CRISPR-Cas technology has become an important tool in crop research. Recently, the use of Artificial Intelligence (AI) with genome editing has attracted attention because it can help researchers study large amounts of genetic information and choose suitable targets for editing. AI-based methods can be used to identify genes that are related to useful characteristics such as better yield, disease resistance, drought tolerance, salt tolerance, and improved nutritional quality. AI can also assist in designing guide RNAs for CRISPR-Cas systems and predicting how effectively a particular site may be edited. Another important use is the identification of possible off-target sites, where unwanted changes could occur. By predicting these sites before carrying out laboratory experiments, researchers can select more suitable targets and improve the accuracy of genome editing. The use of AI-guided genome editing has been studied in several crops, including rice, wheat, maize, tomato, and soybean. It may help in developing crop varieties that can perform better under difficult environmental conditions and require fewer resources such as water and fertilizers. This approach can also reduce the time and effort involved in searching for suitable genes and editing sites. However, it is not free from limitations. The accuracy of AI predictions depends on the quality and amount of genetic data available. Results predicted by computer models also need to be confirmed through laboratory and field experiments. Issues related to biosafety, unintended genetic changes, regulations, data availability, and public acceptance also need attention. This review focuses on the role of AI in crop genome editing, particularly in the identification of target genes, guide RNA design, prediction of editing efficiency, and detection of possible off-target effects. It also discusses the major applications, limitations, and future scope of this approach. The combination of AI and genome editing has considerable potential in crop improvement, but careful testing and responsible use will be necessary for its successful application in agriculture.

Keywords: Artificial Intelligence, Crop Genome Editing, CRISPR-Cas, Crop Improvement, Machine Learning, Guide RNA, Off-target Effects, Crop Genomics, Sustainable Agriculture.

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Artificial Intelligence in Biological and Medical Research: Applications, Advances and Challenges

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Abstract:

Artificial Intelligence (AI) is becoming an important part of modern biological and medical research. In recent years, researchers have started using AI to handle the large amount of information generated from biological experiments, genetic studies, medical records and clinical research. Biological and medical research often involves complex data that can be difficult and

time-consuming to analyse using traditional methods. AI can help researchers find useful patterns in such data and support faster and more informed scientific work. Its applications are being explored in areas such as genomics, drug discovery, disease diagnosis, medical imaging, protein analysis and personalized medicine. The increasing use of AI has created new opportunities for understanding diseases and improving the way research is carried out.

The present review was prepared by studying and comparing previously published research articles and scientific literature related to the use of AI in biological and medical research. Literature related to machine learning, deep learning and other AI-based approaches was considered. The review mainly focuses on the applications of AI in genomics, drug discovery, medical imaging, disease prediction, protein research and personalized medicine. The available studies were examined to understand the major developments, benefits, limitations and future possibilities of AI in these fields. The information from different studies was organized according to their major areas of application to provide a clear understanding of the current role of AI in research.

The reviewed literature shows that AI can provide valuable support in both biological and medical research. In genomics, AI can help researchers analyse large genetic datasets and identify patterns that may be associated with diseases or biological functions. In drug discovery, AI can be used to study molecules, predict possible drug-target interactions and help identify promising drug candidates. This may reduce the time required during the early stages of drug development. AI is also being used in medical imaging, where it can assist in examining X-rays, CT scans, MRI images and microscopic images to identify patterns related to different diseases. In addition, AI-based methods are being explored for disease prediction and personalized medicine, where information from individual patients can be analysed to support more suitable treatment approaches. In biological research, AI can also assist in protein structure prediction and understanding complex molecular processes. However, the use of AI also has certain limitations. The quality of the results depends strongly on the quality and amount of data used. Inaccurate or biased data may lead to unreliable results. Data privacy, ethical concerns, lack of transparency and the difficulty of understanding some AI-generated results are other important challenges. Therefore, AI should be used carefully and together with proper scientific validation and human expertise.

AI has the potential to make biological and medical research faster, more organized and more efficient. It can help researchers analyze complex datasets, understand disease mechanisms, support drug discovery and explore new approaches to diagnosis and treatment. However, AI should not be considered a replacement for researchers, doctors or scientific judgment. Proper validation, good-quality data, ethical practices and human supervision are important for its safe and meaningful use. Further research is needed to improve the accuracy, reliability, transparency and practical application of AI in biological and medical fields. Overall, the combination of AI with human scientific knowledge may open new possibilities for future research and healthcare.

Keywords: Artificial Intelligence; Machine Learning; Biological Research; Medical Research; Drug Discovery.



Tsunami Hazard in Odisha: A Review of Its Impact, Vulnerability and Disaster Management

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Abstract:

Tsunamis are a series of powerful ocean waves generated mainly by sudden disturbances beneath the sea, particularly undersea earthquakes, volcanic eruptions, and submarine landslides. The coastal state of Odisha, situated along the Bay of Bengal, has a long and densely populated coastline and is therefore exposed to various coastal hazards, including the potential threat of tsunamis. Although tsunamis are less frequent in Odisha than cyclones, their sudden occurrence and destructive potential make them an important subject for disaster-risk assessment and management. This review examines the impact, vulnerability, and disaster-management measures associated with tsunami hazards in Odisha. The 2004 Indian Ocean tsunami demonstrated the destructive capacity of tsunami waves in the Indian Ocean region and increased awareness about tsunami preparedness along India's eastern coastline. Odisha's low-lying coastal plains, river deltas, estuaries, beaches, and coastal settlements contribute to its vulnerability to coastal inundation, strong currents, erosion, and damage to infrastructure.

Coastal districts such as Balasore, Bhadrak, Kendrapara, Jagatsinghpur, Puri, and Ganjam may be particularly important in tsunami-risk assessment because of their geographical and demographic characteristics. A tsunami can have significant environmental and socio-economic consequences. Coastal ecosystems, agricultural land, freshwater resources, fisheries, settlements, roads, communication networks, and other infrastructure may be affected by flooding and saltwater intrusion. Natural ecosystems such as mangroves, coastal vegetation, wetlands, and sand dunes can provide a degree of protection by reducing wave energy and coastal erosion. Conservation and restoration of these ecosystems can therefore contribute to overall coastal resilience. Effective disaster management is essential for reducing tsunami-related risks.

Earlywarning systems, continuous monitoring of earthquakes and sea-level changes, hazard mapping, public awareness, evacuation planning, emergency shelters, community participation, and regular disaster-response drills are important components of tsunami preparedness. Coordination between scientific agencies, government authorities, local communities, and disaster-management organizations is also necessary for an effective response. Overall, this review emphasizes that, despite the relatively low frequency of tsunamis in Odisha compared with other coastal hazards, preparedness should remain an important part of coastal disaster management. Combining scientific early-warning systems with appropriate land-use planning, protection of natural coastal barriers,

public education, and community-based preparedness can help reduce potential loss of life, property, and environmental resources. Strengthening tsunami awareness and preparedness can contribute to a safer and more resilient coastal Odisha.

Keywords: Tsunami, Odisha, Bay of Bengal, Coastal Hazard, Vulnerability, Disaster Management, Early Warning System, Coastal Resilience.



The Climate Cascade: Rising Temperatures, Glacier Loss and Flash-Flood Hazards in Nepal and Assam

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Abstract:

Flash floods are among the most sudden and destructive natural hazards, particularly in mountainous and riverine regions where intense rainfall and rapid changes in water flow can quickly threaten human life, settlements, and infrastructure. In recent years, increasing attention has been given to the relationship between flash floods and climate change. The rise in greenhouse gases, including carbon dioxide and methane, has strengthened the greenhouse effect and contributed to a steady increase in global temperatures. This warming is influencing rainfall patterns, snow cover, glacier behaviour, and the overall water cycle, creating new challenges for regions already exposed to floods. Temperature rise is especially important in the Himalayan region, where glaciers and snow provide a major source of freshwater.

Continuous warming is causing glaciers to lose mass and retreat, while some glacial lakes are expanding. The accumulation of water in unstable glacial lakes can increase the possibility of glacial lake outburst floods, in which large quantities of water are released suddenly and travel rapidly downstream. Heavy rainfall can further increase this danger by producing intense runoff and triggering landslides, debris flows, and sudden rises in river levels. However, climate change is not the only factor responsible for increasing flood damage. Deforestation, changing land use, road construction, urban expansion, soil degradation, and settlements near rivers can reduce the ability of natural landscapes to absorb excess water. Nepal represents an important example of these interconnected environmental changes. Its steep mountain terrain, glaciers, glacial lakes, and monsoon rainfall make many communities vulnerable to sudden flooding.

Changes in temperature and precipitation can interact with unstable slopes and rapidly changing water systems, increasing risks to settlements, agriculture, roads, bridges, and other infrastructure. Downstream, the effects of changing climate and river conditions can also be observed in Assam,

where the Brahmaputra and its tributaries regularly overflow during the monsoon season. Intense rainfall, riverbank erosion, sediment deposition, wetland changes, and human settlement patterns contribute to the severity of flooding in the state. This review examines the connections between the greenhouse effect, rising temperature, climate change, glacier melting, extreme rainfall, and flash-flood hazards, with particular attention to Nepal and Assam. It also discusses the social and environmental consequences of flooding, including loss of life, displacement, crop damage, infrastructure destruction, and disruption of livelihoods. The review suggests that reducing future risks requires more than emergency response. Improved rainfall and river monitoring, glacier and glacial-lake assessment, effective early-warning systems, careful land-use planning, ecosystem conservation, and community participation are essential. A better understanding of how climatic and human factors interact can help vulnerable communities prepare for changing flood conditions and build greater long-term resilience.

Keywords: Flash floods; Climate change; Glacier melting; Brahmaputra River; Disaster management; Climate resilience.



Climate Change and Human Health Integration

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Abstract:

Climate change is one of the major environmental problems affecting human health across the world. Changes in temperature, rainfall, humidity and the increasing frequency of heat waves, floods, droughts and other extreme weather events can directly or indirectly affect human health. The present review focuses on the relationship between climate change and human health and discusses the different health problems associated with changing climatic conditions. Increased temperature can cause heat stress, dehydration, heat exhaustion and other heat-related health problems, especially among children, older people and outdoor workers. Changes in climate can also affect air quality and may increase respiratory problems such as asthma and other breathing disorders. Climate change can influence the spread and distribution of infectious diseases by creating suitable conditions for disease-causing organisms and their vectors. Diseases transmitted by mosquitoes and other vectors may become more common in areas where climatic conditions become favourable for their growth and survival.

Changes in rainfall, flooding and water availability can also increase the risk of water-borne diseases and affect access to safe drinking water. Climate change has an important effect on food production and can contribute to food insecurity and nutritional problems through changes in crop production, water availability and agricultural conditions. Extreme weather events may also cause

injuries, displacement and loss of basic health facilities, which can make healthcare services difficult to access. In addition to physical health, climate change can affect mental and social well-being. People experiencing natural disasters, displacement, loss of livelihood or changes in their living conditions may face stress, anxiety and other psychological difficulties. The health effects of climate change are not equal for all populations. People living in poor and highly exposed communities may face greater risks because of limited resources, poor housing, lack of clean water and limited access to healthcare services. Therefore, understanding the connection between climate change and human health is important for developing effective public health strategies.

Adaptation measures such as early warning systems, heat action plans, disease surveillance, better sanitation, access to clean water and climate-resilient healthcare facilities can help reduce health risks. At the same time, reducing greenhouse gas emissions through cleaner energy, sustainable transportation, improved waste management and protection of natural resources can provide additional health benefits. This review highlights the need for greater cooperation between environmental science, healthcare, public health and communities to reduce the health effects of climate change. Integrating climate change considerations into health planning and policies can help protect vulnerable populations and support a healthier and more resilient society.

Keywords: Climate Change, Human Health, Public Health, Heat Stress, Infectious Diseases, Air Pollution, Food Security



Applications of Polymer Nanocomposite Membrane Derived from Waste Plastics in Dye Degradation

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Abstract:

Polymer nanocomposite membranes have emerged as a promising strategy for sustainable wastewater treatment, particularly for the removal of persistent industrial dyes. By incorporating nanoparticles into polymer matrices, these membranes exhibit improved properties such as enhanced permeability, selectivity, mechanical strength, and antifouling performance. An additional advantage lies in the potential to fabricate such membranes from waste plastics, transforming environmental pollutants into high-value functional materials. Despite their potential, challenges such as achieving uniform nanoparticle dispersion, ensuring long-term stability, and optimizing fabrication methods limit the practical application of polymer nanocomposite membranes. Addressing these issues is essential for the development of cost-effective, durable, and eco-friendly

nanocomposite membranes capable of efficiently treating dye-contaminated wastewater. This work includes the separation of pure polymer from waste plastic wrapper (icon 7) by solvent extraction method. Furthermore, AgNPs prepared by the green synthesis method were incorporated into the pure polymer matrix to create a polyethylene membrane (PEM-Ag) via the solvent casting technique. PEM-Ag was used as a catalyst for the degradation of methylene blue, methyl green and crystal violet dyes.

Keywords: Waste Plastics, Polymer Membranes, Nanotechnology, Dye Degradation



Design and Development of Ionophores for Selective Cation and Anion Transport

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Abstract:

Ionophores, which are sophisticated molecular systems, can selectively transport ions through membranes due to their unique host-guest interactions. The use of aromatic anion-binding elements in ionophores is particularly useful for the purpose of modifying anion bindings, optimizing their affinity, and enhancing their transport capacities. Due to multiple capabilities of aromatic functionalization, including hydrogen and electrostatic bonding, π -acceptor interaction, and halogen bonding, one can easily achieve the recognition of many types of ions such as chloride, bromide, nitrate, and bicarbonate. The various physical and chemical characteristics associated with the aromatic framework can be altered to modify the efficiency of the transport process. When combined with co-transporting capabilities of the cation-binding regions, the new technology can promote the co-transport of cations and anions and the ion exchange processes that can help in creating ionic gradients through membranes. The behavior of transport is shaped by parameters like lipophilicity of ionophores, composition of the membrane, size of ions, binding affinity, and the interplay between ion identification and release. These systems provide an excellent opportunity for the study of certain key aspects concerning supramolecular ion recognition and transport across membranes. At the same time, ionophores containing aromatic anion-recognizing groups can be employed in synthetic ion channels, molecular sensors, drugs with membrane activity as well as synthetic transport systems. So, the rational design of these ionophores serves as an important approach to obtain cation and anion transport regulated and selected over membranes.

Keywords: Transport, Ion recognition, Sensors, Co-transport.



Green-Synthesized Nanoparticles for Sustainable Environmental Remediation

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Abstract:

The problem of water bodies contamination with toxic heavy metals, dyes, pesticides, and pharmaceuticals is very pressing and the need for novel remediation methods that are both effective and environmentally friendly is obvious. In this regard, green synthesis of nanoparticles (NPs) has become a good alternative to traditional methods, offering less energy consumption and avoiding hazardous chemical agents and toxic side products. Biological matter, such as plant extracts, microorganisms, algae, and biomaterials of natural origin, can serve as reducing agents, stabilizing agents, and capping agents, for the synthesis of nanoparticles with desired physical and chemical characteristics. Green-synthesized nanoparticles, including metal, metal oxide, and composite nanomaterials, have superior characteristics, such as large surface area, improved absorption capacity, and catalytical or photocatalytic properties, making their application in environmental remediation possible. Their use in wastewater treatments may enhance the effectiveness of techniques like adsorption, photocatalytic degradation, reduction, and antimicrobial processes. However, aspects such as stability, clustering, retrieval, toxicity, environmental behavior, and scaling of nanoparticles must be considered. Thus, the use of green nanotechnology in environmental remediation enables pollution control by providing a more sustainable approach to it. This method corresponds to the achievement of United Nations Sustainable Development Goal 6 (SDG 6): Clean Water and Sanitation, since it helps improve water quality and decrease the release of dangerous pollutants in the water bodies.

Keywords: Green synthesis, NPs, Remediation, SDG 6, Catalytic.



Enzymatic Degradation of Petroleum Hydrocarbons

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Abstract:

A significant and expanding worldwide environmental problem is soil pollution, especially from persistent organic pollutants including polycyclic aromatic hydrocarbons (PAHs), different insecticides, and complicated petroleum product mixes. The ecological balance, food safety, and eventually human health are all seriously threatened by this widespread problem. The development and use of efficient, ecologically friendly, and sustainable clean up technology is imperative due to the pressing nature of this environmental issue. Enzymatic bioremediation is an ecological and sustainable replacement of traditional bioremediation by using naturally occurring or engineered manufactured enzymes. This high-tech process disintegrates and detoxifies the harmful organic pollutants directly in the soil structure through the catalytic potential of enzymes naturally occurring or of carefully created design. Along with commenting on the latest technological achievements, such as the nano biocatalysts and the immobilization of enzymes, this review article critically analyses the key enzymatic processes in the detoxification of soil. It covers such questions as the stability of enzymes and delivery and takes into account the possible future trends that will integrate synthetic biology with nanotechnology. It particularly lays emphasis onto practical applications, relevant case studies, and how the strategies can be integrated into sustainable systems such as the circular economy. This study provides an interdisciplinary insight into scaling the enzymatic bioremediation process of the lab to the field with the ultimate objective of enhancing the restoration of soil health and lengthy ecological resilience.

Keywords: Enzymatic bioremediation, soil pollution, polycyclic aromatic hydrocarbons (PAHs), nano biocatalysts, enzyme immobilization



Next-Generation Drug Delivery: The Role of Artificial Intelligence and Machine Learning in Precision Nanomedicine and Targeted Delivery

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Abstract

Conventional pharmaceutical formulation and nanocarrier design have traditionally relied on empirical, resource-intensive, time taking and trial-and-error methodologies. Optimizing critical properties such as bioavailability, targeting specificity, controlled release kinetics and systemic toxicity remain a major bottleneck in advancing therapeutics to the clinic. The integration of artificial intelligence (AI), machine learning (ML), deep learning architectures and big data analytics is shifting pharmaceutical sciences toward a predictive, data-centric paradigm. This synthesis evaluates AI applications across the drug delivery development process focusing on active pharmaceutical ingredient (API) manufacturing and engineering of diverse nanocarriers like lipid nanoparticles, polymeric micelles, liposomes and dendrimers.

AI and predictive computational modelling improve formulation efficiency by accurately forecasting critical quality attributes (CQAs), encapsulation efficiency, physicochemical stability, release profiles of therapeutics and early-stage nanotoxicity. Furthermore, the convergence of AI with nanoarchitecture enables the design of programmable, stimuli responsive and patient specific precision nanomedicine that are capable of crossing complex biological barriers. Despite significant preclinical success, lab to medical translation is constrained by data standardization gaps, scalable manufacturing challenges, model interpretability limits and evolving regulatory pathways. Overcoming these barriers are essential and therefore requires an integrated framework that combines computational intelligence with experimental validation and regular clinical feedback. In conclusion, AI-guided formulation can serve as a guided cornerstone for scalable, safe and precise development of next-generation nanotherapeutics.

Keywords: Artificial Intelligence, Machine Learning, Nanocarriers, Drug Delivery Systems and Precision Nanomedicine.



Biotechnology Approaches for Environmental Pollution Control

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Abstract:

Environmental pollution has become a serious problem because of increasing industrial activities, urban growth, agricultural practices, and improper disposal of waste. Pollutants released into the environment can affect soil, water, air, plants, animals, and human health. Industrial chemicals, pesticides, heavy metals, plastics, and untreated wastewater can remain in the environment for a long time and may disturb natural ecosystems. Traditional methods are available for pollution control, but some of them require high energy, expensive equipment, and regular maintenance. Biotechnology provides biological methods that can be used to reduce pollution in a more natural and sustainable way. The use of microorganisms, plants, enzymes, and other biological materials has therefore received increasing attention in environmental management.

The present work is a review based on published scientific literature related to biotechnology and environmental pollution control. Information was collected and studied on major biological methods, including bioremediation, phytoremediation, microbial degradation, enzyme-based treatment, and biological wastewater treatment. The role of bacteria and fungi in breaking down organic pollutants was considered along with the ability of selected plants to remove or stabilize contaminants from soil and water. Different applications of biotechnology in the treatment of domestic and industrial wastewater, solid waste, and contaminated sites were also examined. Recent developments such as biosensors, genetically modified microorganisms, and integrated biological treatment systems were considered to understand their future possibilities.

The review shows that microorganisms can play an important role in reducing several types of environmental pollutants. Certain bacteria and fungi are capable of using organic pollutants as a source of energy and converting them into simpler and less harmful substances. Phytoremediation is another useful approach in which plants help to absorb, accumulate, stabilize, or transform pollutants. It can be particularly useful in areas affected by heavy metals and other contaminants. Enzymes made by microorganisms can also be useful in breaking down some complex pollutants that are difficult to remove by normal treatment methods. Microorganisms are commonly used in wastewater treatment to reduce organic matter and other harmful substances before the water is discharged. Biological methods are generally safer for the environment and can also be economical when locally available microorganisms and plants are used. However, their efficiency is affected by conditions such as temperature, pH, nutrients, amount of pollution, and the availability of suitable microorganisms or plants. Maintaining proper conditions is therefore important for getting better treatment results.

Biotechnology can be a useful approach for reducing environmental pollution and improving the condition of polluted areas. Methods such as bioremediation, phytoremediation, microbial

degradation, enzyme treatment, and biological wastewater treatment can be used along with conventional pollution-control methods. New technologies such as biosensors may also help in detecting pollutants more quickly and improving environmental monitoring. However, more practical and field-based studies are required to understand how effective these methods are under different environmental conditions. The combined use of biological and conventional methods can provide a simple and sustainable way to manage pollution and protect the environment.

Keywords: Biotechnology, Bioremediation, Phytoremediation, Microbial Degradation, Wastewater Treatment



Climate Change and Human Health Integration

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Abstract:

Climate change is one of the major environmental problems affecting human health across the world. Changes in temperature, rainfall, humidity and the increasing frequency of heat waves, floods, droughts and other extreme weather events can directly or indirectly affect human health. The present review focuses on the relationship between climate change and human health and discusses the different health problems associated with changing climatic conditions. Increased temperature can cause heat stress, dehydration, heat exhaustion and other heat-related health problems, especially among children, older people and outdoor workers. Changes in climate can also affect air quality and may increase respiratory problems such as asthma and other breathing disorders. Climate change can influence the spread and distribution of infectious diseases by creating suitable conditions for disease-causing organisms and their vectors.

Diseases transmitted by mosquitoes and other vectors may become more common in areas where climatic conditions become favourable for their growth and survival. Changes in rainfall, flooding and water availability can also increase the risk of water-borne diseases and affect access to safe drinking water. Climate change has an important effect on food production and can contribute to food insecurity and nutritional problems through changes in crop production, water availability and agricultural conditions. Extreme weather events may also cause injuries, displacement and loss of basic health facilities, which can make healthcare services difficult to access. In addition to physical health, climate change can affect mental and social well-being. People experiencing natural disasters, displacement, loss of livelihood or changes in their living conditions may face stress, anxiety and other psychological difficulties. The health effects of climate change are not equal for all populations. People living in poor and highly exposed communities may face greater risks because of limited resources, poor housing, lack of clean water and limited access to healthcare

services. Therefore, understanding the connection between climate change and human health is important for developing effective public health strategies. Adaptation measures such as early warning systems, heat action plans, disease surveillance, better sanitation, access to clean water and climate-resilient healthcare facilities can help reduce health risks. At the same time, reducing greenhouse gas emissions through cleaner energy, sustainable transportation, improved waste management and protection of natural resources can provide additional health benefits. This review highlights the need for greater cooperation between environmental science, healthcare, public health and communities to reduce the health effects of climate change. Integrating climate change considerations into health planning and policies can help protect vulnerable populations and support a healthier and more resilient society.

Keywords: Climate Change, Human Health, Public Health, Heat Stress, Infectious Diseases



Evaluating the Effectiveness of AI-Driven Medication Adherence Tools in Reducing Psychiatric Rehospitalization

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Abstract:

Medication non-adherence is common in serious psychiatric disorders and can contribute to relapse, emergency care, and rehospitalization. Digital tools may help identify missed medication earlier and support timely clinical intervention. The present study emphasis on assessment of technology-assisted medication adherence monitoring whether that can improve medication-taking behaviour and reduce psychiatric rehospitalization.

Methods: Adults with serious mental illness was processed with routine psychiatric care or routine care alternatively supplemented with a digital adherence tool, such as a smart pillbox or medication application. The system used reminders and record medication-taking patterns. Repeated missed doses were promptly reviewed by psychiatric nurses, who contacted patients, explored barriers, and arranged appropriate support. Medication adherence, emergency visits, treatment engagement, rehospitalization, and time to first rehospitalization also was compared between groups.

Results: Digital adherence tools found to be improved regular system with medication to be used through reminders and early recognition of missed doses. Present study also has shown encouraging reductions in psychiatric hospitalization with some digital medication systems, although benefits have varied across patients and technologies. Patient acceptance, usability, digital literacy, and timely professional follow-up appear important for successful implementation.

Conclusion: Digital medication monitoring can be a useful adjunct to psychiatric care, particularly when combined with nursing support, patient education, counselling, and early intervention. Further well-designed studies are needed to determine whether these tools consistently reduce psychiatric rehospitalization and provide good value in routine practice.

Keywords: Medication Adherence; Psychiatric Rehospitalization; Digital Health; Medication Monitoring; Smart Pillbox; Digital Medicine; Psychiatric Nursing; Patient Safety.

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Applications of Convolutional Neural Networks in Biometric Measurement, Anatomical Segmentation, and Congenital Anomaly Detection

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Background: Prenatal ultrasound and fetal MRI play an important role in assessing fetal growth and identifying congenital abnormalities. However, accurate interpretation often depends on the experience of the operator, and small differences in image quality or fetal anatomy can make assessment difficult. Convolutional Neural Networks (CNNs) offer an opportunity to assist clinicians by automating repetitive and technically demanding imaging tasks. This study evaluated the potential of CNN-based methods to support fetal biometric measurements, anatomical segmentation, and the detection of major congenital abnormalities.

Methods: A multicentre deep-learning framework was assessed using 2D and 3D ultrasound and fetal MRI images. CNN models were used to identify appropriate fetal imaging planes and measure head circumference, biparietal diameter, abdominal circumference, and femur length. Segmentation models were then applied to structures such as the fetal skull, brain ventricles, and cardiac chambers. Finally, selected anatomical regions were analysed to identify features suggestive of central nervous system abnormalities, congenital heart disease, and skeletal disorders.

Results: CNN-based biometric measurements showed more than 96% agreement with measurements made by experienced clinicians and reduced variation between observers by over 30%. Anatomical segmentation produced a mean Dice Similarity Coefficient greater than 0.88. For detection of major congenital abnormalities, the models achieved AUROC values ranging from 0.85 to 0.91.

Conclusion: CNN-based imaging tools show promising potential for supporting routine prenatal assessment. By providing consistent measurements, clearer anatomical delineation, and early alerts for suspicious findings, these systems may reduce workload and support clinicians in making timely

decisions. However, they should be viewed as supportive tools rather than replacements for clinical expertise, and further prospective validation is needed before widespread clinical use.

Keywords: Convolutional Neural Networks; Deep Learning; Fetal Biometry; Anatomical Segmentation; Congenital Anomalies; Prenatal Imaging; Ultrasound; Fetal MRI.

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Tools Guiding Home-Visiting Nurses Through Multi-Variable Environmental and Family Health Screenings

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Background: Home-visiting nurses often assess patients in complex household settings where clinical conditions, environmental hazards, and social factors may interact. Conventional paper-based and static electronic screening forms can increase documentation time and may not adequately identify interconnected risks during a home visit. The study examined whether AI-supported clinical decision tools could help home-visiting nurses improve risk identification, reduce documentation time, and support more efficient environmental and family health screening.

Methods: A mixed-methods implementation study was conducted using mobile AI-based screening tools incorporating adaptive questioning, natural language processing, and risk-scoring features. Nurses recorded clinical, environmental, and family health information during home visits. The system generated additional questions according to the information entered—for example, prompting respiratory health assessment when dampness or mold was reported. Screening performance, risk identification, documentation time, and nurse usability were assessed over 12 months.

Results: Use of the AI-supported system was associated with a 34% increase in identification of combined environmental and social risks compared with static screening forms. Documentation time was reduced by approximately 28% per visit, largely through voice-to-text documentation and adaptive questioning. False-negative identification of family mental health concerns and household safety hazards decreased by 22%.

Conclusion: AI-supported screening tools may help home-visiting nurses recognize interconnected health and environmental risks more effectively while reducing the time spent on documentation. Context-sensitive prompts can support earlier recognition of problems and may help nurses provide more focused interventions during routine home visits.

Keywords: Artificial Intelligence; Clinical Decision Support; Home-Visiting Nurses; Environmental Health; Social Determinants of Health

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Isolation, Characterization, Optimization, and Genetic Transformation of Oil-Degrading Microorganisms for Enhanced Bioremediation

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Abstract:

Oil contamination is a major environmental concern that adversely affects terrestrial and aquatic ecosystems. Bioremediation using oil-degrading microorganisms provides an eco-friendly and cost-effective approach for the removal of petroleum hydrocarbons from contaminated environments. The present study was undertaken to isolate and characterize oil-degrading microorganisms from oil-contaminated sites and to evaluate their potential for oil degradation and biosurfactant production. The bacterial isolates *Bacillus megaterium*, *Pseudomonas fluorescens*, and *Staphylococcus aureus* were isolated and identified according to Bergey's Manual. The isolated microorganisms were screened for their ability to degrade oil and produce biosurfactants using different experimental approaches, including the shake-flask method, agar well diffusion method, and spread plate method. Further, optimization studies were performed to determine the most suitable carbon and nitrogen sources and the optimum pH and temperature conditions for enhanced microbial growth, oil degradation, and biosurfactant production.

In addition, plasmid DNA was isolated from the selected production cultures and subjected to restriction digestion and ligation. The resulting genetic material was subsequently introduced into non-oil-degrading microorganisms through transformation to investigate the transfer of oil-degrading genetic determinants. The study provides an integrated approach combining microbial isolation, biodegradation assessment, process optimization, and genetic techniques for improving the potential of microorganisms in petroleum hydrocarbon degradation. The findings may contribute to the development of effective microbial strategies for the bioremediation of oil-contaminated environments.

Keywords: Environmental problem Molecular study, Microorganisms isolated, Bergey's Manual, Biosurfactant production, Optimization, restriction digestion and ligation, Genetic transformation

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Bioremediation Potential of Indigenous Microorganisms Isolated from Semi-Arid Soils of Alwar, Rajasthan

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Abstract:

Semi-arid soils constitute environmentally stressful microbial habitats characterized by limited water availability, fluctuating temperature, nutrient limitation, and variable physicochemical conditions, which may select for microorganisms with specialized metabolic and stress-adaptation mechanisms. The present study investigated indigenous microorganisms from semi-arid soils of Alwar, Rajasthan, India, for their potential to degrade petroleum-derived xenobiotic hydrocarbons. A total of 30 soil samples were collected from five representative locations of Alwar district, including agricultural, rhizospheric, barren, and anthropogenically influenced sites. Culture-dependent isolation resulted in the recovery of 141 microbial isolates, comprising 96 bacterial isolates, 27 actinomycetes, and 18 fungal isolates. Initial screening using hydrocarbon-supplemented selective media identified 43 isolates exhibiting significant hydrocarbon tolerance, of which 12 demonstrated comparatively higher degradation potential. Selected isolates were evaluated for their ability to degrade crude oil, diesel, and used engine oil under controlled laboratory conditions. The most efficient bacterial isolate exhibited $81.6 \pm 2.4\%$, $76.3 \pm 2.1\%$, and $72.8 \pm 2.6\%$ degradation of crude oil, diesel, and used engine oil, respectively, after 21 days of incubation. The most efficient actinomycete and fungal isolates demonstrated $74.2 \pm 2.3\%$ and $68.7 \pm 2.5\%$ degradation, respectively. Optimization studies indicated maximum degradation at pH 7.0–7.5 and 30–35°C. The results demonstrate that semi-arid soils of Alwar harbor metabolically versatile indigenous microorganisms with considerable hydrocarbon-degrading potential. These locally adapted microbial strains may serve as promising candidates for developing sustainable and environmentally compatible bioremediation strategies for petroleum-contaminated environments.

Keywords: Semi-arid soil; Alwar, Rajasthan; Xenobiotic biodegradation; Hydrocarbon-degrading microorganisms; Bioremediation.



Ethical, Legal, and Regulatory Challenges of the Use of Artificial Intelligence in Robotic Surgery

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Background: Artificial intelligence (AI) is becoming increasingly involved in robotic surgery, assisting with surgical planning, image interpretation, tissue identification, intraoperative guidance, and postoperative care. While these developments may improve precision and support surgeons during complex procedures, they also raise important questions about patient autonomy, privacy, safety, accountability, and professional responsibility. The objective of study was to examine the major ethical, legal, and regulatory issues associated with the use of AI-assisted robotic surgery and identify principles for its safe and responsible clinical adoption.

Methods: A descriptive review of published literature and available evidence was undertaken, focusing on informed consent, patient-data protection, algorithmic bias, transparency, cybersecurity, liability, human oversight, professional responsibility, and regulatory evaluation. Particular attention was given to the responsibilities of surgeons, hospitals, technology developers, and regulatory authorities throughout the life cycle of AI-enabled surgical systems.

Results: The review identified informed consent and patient understanding of AI involvement as important ethical considerations. Concerns also include biased algorithms, protection of sensitive clinical data, cyber threats, limited explainability, software changes after approval, and uncertainty regarding liability when an AI-assisted system contributes to an adverse event. Effective governance therefore requires clear allocation of responsibility, continuous performance monitoring, appropriate validation, and meaningful human supervision.

Conclusion: AI-assisted robotic surgery offers considerable potential to improve surgical care, but technological capability must be matched by appropriate safeguards. Transparent consent, secure data practices, bias assessment, cybersecurity, post-deployment monitoring, clear liability frameworks, and continuing professional training are essential. At present, AI should strengthen—not replace—surgical expertise, clinical judgment, and patient-centered decision-making. Responsible integration will depend on maintaining a practical balance between innovation, safety, and human accountability.

Keywords: Artificial Intelligence; Robotic Surgery; Medical Ethics; Informed Consent; Patient Safety; Data Privacy; Cybersecurity; Algorithmic Bias; Liability; Human Oversight.

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Early Warning Systems for Detecting Clinical Deterioration in Hospitalized Patients

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Background: Clinical deterioration in hospitalized patients may be preceded by subtle changes in vital signs and laboratory parameters. Conventional Early Warning Scores (EWS) depend on periodic observations and manual calculations, which may delay recognition and escalation of care. The study objective was to evaluate the effectiveness of an automated Early Warning System integrating continuous physiological monitoring, Electronic Health Records (EHR), and machine-learning algorithms for predicting clinical deterioration and improving inpatient outcomes.

Methods: A multicentre cohort study was evaluated as an EHR-integrated EWS across general medical-surgical wards. Heart rate, blood pressure, respiratory rate, oxygen saturation, temperature, and routine laboratory data were continuously or periodically incorporated into the system. Machine-learning models, including gradient-boosted trees and multivariable predictive logic, generated real-time deterioration risk scores. High-risk thresholds triggered automated alerts to nurses and the Medical Emergency Team. Outcomes were compared with historical pre-implementation controls, including unplanned ICU transfers, ward-based cardiac arrests, 30-day mortality, and time to clinical review.

Results: The machine-learning-enhanced EWS demonstrated higher discriminatory performance than conventional manual scoring, with an AUROC of 0.86 versus 0.72. Following implementation, unplanned ICU transfers decreased by 21%, ward-based cardiac arrests decreased by 18%, and time from physiological deterioration to bedside clinical review was reduced by approximately 35 minutes.

Conclusion: Automated, EHR-integrated EWS combining continuous monitoring with machine-learning risk prediction may facilitate earlier detection of clinical deterioration and faster clinical intervention. Such systems can strengthen patient safety and potentially reduce preventable adverse events in general wards. Further prospective validation across diverse healthcare settings is recommended.

Keywords: Early Warning System; Clinical Deterioration; Machine Learning; Electronic Health Records; Vital Sign Monitoring; Patient Safety

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A study to assess the knowledge of staff nurses regarding Future of Artificial Intelligence in Paediatric Emergency Care

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Background: Artificial Intelligence (AI) is an emerging technology with the potential to transform pediatric emergency care. It can support healthcare professionals in early identification of critically ill children, clinical decision-making, patient monitoring, triage, prediction of complications, and efficient management of emergency resources. AI-based systems can analyze large amounts of clinical data rapidly and assist nurses and other healthcare professionals in providing timely and evidence-based care. Staff nurses play an important role in pediatric emergency departments because they are directly involved in patient assessment, monitoring, emergency interventions, medication administration, documentation, and communication with the healthcare team. Knowledge regarding the future applications, benefits, limitations, ethical concerns, and challenges of AI is therefore essential for nurses working in pediatric emergency settings.

Method: A quantitative research approach with a descriptive research design was adopted to assess the knowledge of staff nurses regarding the future of Artificial Intelligence in pediatric emergency care. The study was conducted among staff nurses working in a selected pediatric emergency care setting. Participants were selected using a convenient sampling technique. Data were collected using a structured knowledge questionnaire covering areas such as the concept of AI, applications of AI in pediatric emergency care, benefits, limitations, ethical considerations, patient safety, and future prospects. The collected data were analyzed using descriptive statistics such as frequency, percentage, mean, and standard deviation.

Result: The findings of the study indicated that staff nurses had varying levels of knowledge regarding the future of Artificial Intelligence in pediatric emergency care. A considerable proportion of staff nurses demonstrated moderate knowledge, while some had adequate knowledge and others had inadequate knowledge. The results highlighted the need for regular educational programs, workshops, and continuing nursing education related to AI and its applications in pediatric emergency care.

Conclusion: The study concluded that knowledge regarding Artificial Intelligence is important for staff nurses working in pediatric emergency care. Although some nurses possessed adequate knowledge, gaps were identified in understanding the future applications, ethical issues, limitations, and safe use of AI. Regular training and continuing education programs can improve nurses' knowledge and confidence in using AI-based technologies. Proper integration of AI with nursing practice may enhance the quality, efficiency, safety, and timeliness of pediatric emergency care.

Key Words: Artificial Intelligence, Staff Nurses, Pediatric Emergency Care, Knowledge, Emergency Nursing



A Pre-Experimental Study to Assess the Effectiveness of Structured Teaching Program on Knowledge Regarding Respiratory Distress Syndrome in Newborn among Nursing Officers Working at Paediatric Unit of Selected Hospitals in Jodhpur

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Background: Respiratory Distress Syndrome (RDS) is a major cause of morbidity and mortality among newborns, particularly preterm infants. Early recognition and appropriate management are essential for preventing complications and improving neonatal outcomes. Nursing officers working in paediatric units play an important role in identifying the signs and symptoms of respiratory distress, providing appropriate nursing care, and assisting in the management of newborns with RDS. Adequate knowledge among nursing officers is therefore essential for providing safe and effective neonatal care. A structured teaching program may help to improve their knowledge and strengthen their ability to provide appropriate care to newborns with RDS.

Methodology: A pre-experimental one-group pre-test and post-test research design was adopted to assess the effectiveness of a structured teaching program on knowledge regarding respiratory distress syndrome in newborns among nursing officers working in paediatric units of selected hospitals in Jodhpur. A total of 110 nursing officers participated in the study. A structured knowledge questionnaire was used to assess their knowledge before and after the intervention. A structured teaching program was administered following the pre-test. Descriptive and inferential statistics were used for data analysis, including frequency, percentage, mean, standard deviation, and paired *t*-test.

Result and Discussion: The findings revealed that the mean pre-test knowledge score of nursing officers was 14.24 ± 6.67 , indicating insufficient knowledge regarding respiratory distress syndrome in newborns. Following the structured teaching program, the mean post-test knowledge score increased to 22.79 ± 6.76 . The improvement in knowledge was statistically significant ($p < 0.001$). The proportion of nursing officers having adequate knowledge increased from 9.09% in the pre-test to 72.72% in the post-test. The findings demonstrate a substantial improvement in knowledge following the structured teaching program and indicate that structured educational interventions can be effective in enhancing nursing officers' knowledge regarding RDS and its neonatal care.

Conclusion: The study concluded that the structured teaching program was effective in improving the knowledge of nursing officers regarding respiratory distress syndrome in newborns. Regular educational and training programs can strengthen the knowledge and preparedness of nursing officers and may contribute to improved recognition, management, and nursing care of newborns with RDS. Further studies may be undertaken to assess long-term knowledge retention and the application of acquired knowledge in clinical practice.

Keywords: Respiratory Distress Syndrome; Newborn; Nursing Officers; Structured Teaching Program; Neonatal Care



A Study to Assess the Effectiveness of Yoga Therapy to Reduce Pregnancy Related Anxiety and Depression during Pregnancy of Pregnant Mothers in Jaipur, Rajasthan

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Background: Pregnancy is a significant physiological and psychological period in a woman's life. Although it is often associated with happiness and anticipation, many pregnant women experience psychological problems such as anxiety, stress, and depression. These conditions may negatively affect maternal well-being, pregnancy outcomes, and the mother–infant relationship. Yoga therapy is a holistic, non-pharmacological intervention involving physical postures, breathing exercises, relaxation, and meditation. It may help improve emotional well-being and reduce anxiety and depressive symptoms during pregnancy.

Method: A quantitative, quasi-experimental research design was adopted. Pregnant mothers meeting the inclusion criteria were selected using a convenient sampling technique. A pre-test assessment of anxiety and depression was conducted using standardized assessment scales. The experimental group received a structured yoga therapy program consisting of gentle prenatal yoga, breathing exercises, relaxation techniques, and meditation for a specified period. Following the intervention, a post-test assessment was conducted. The pre-test and post-test scores were compared to determine the effectiveness of yoga therapy.

Result: The findings showed a reduction in the mean anxiety and depression scores among pregnant mothers after receiving yoga therapy. The post-test scores were significantly lower than the pre-test scores, indicating that yoga therapy was effective in reducing pregnancy-related anxiety and depressive symptoms. The improvement was more evident among mothers who participated regularly in the yoga therapy sessions.

Conclusion: The study concluded that yoga therapy is an effective, safe, and non-pharmacological approach for reducing pregnancy-related anxiety and depression among pregnant mothers. Incorporating appropriate prenatal yoga, breathing exercises, relaxation, and meditation into antenatal care may promote better psychological well-being and improve the overall pregnancy experience.

Key Words: Yoga Therapy, Pregnancy, Anxiety, Depression, Pregnant Mothers, Prenatal Care, Psychological Well-being.

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Evaluation of Medlife's Utrived Syrup on Quality of Patient's Life and Behavioral Changes during Leucorrhoea

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Background: There are multiple products in the herbal formulation segment in the market for Bacterial Vaginosis-Leucorrhoea, but with limited human researches. The objective of this study is to evaluate the change in the quality-of-life patients with Leucorrhoea when treated with Medlife's Utrived Syrup. It was an open label, single arm study. The study was conducted as per good clinical practices guidelines at Shree Ram Hospital, Meerut with approval from the Institutional EC.

Methodology: 60 subjects with mean age 30.35 years were enrolled in the study and assigned the treatment - Medlife's Utrived Syrup for three times a day. The evaluation was done on day 1 and day 30 for limitations of activities, social activities, energy & emotions, pain and general health as part of the SF-36 quality of life questionnaire.

Result and Discussion: Significant improvement was observed in the physical quality of life factors such as pain, and limitations on activities, along with good visible changes observed in social, emotional and general health.

Conclusion: The treatment was safe & tolerable, and no adverse events were reported during the treatment period. Medlife's Utrived syrup significantly improves overall quality of life for patients with Bacterial Vaginosis- Leucorrhoea in 30 days.

Keywords: Medlife's Utrived Syrup, Bacterial Vaginosis-Leucorrhoea, Herbal formulation.

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AI-Driven Healthcare: Integrating Traditional Medicine with Intelligent Tools

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Background: Artificial Intelligence (AI) is metamorphosing the healthcare ecosystem worldwide. The amalgamation of AI with traditional medicine systems—including Ayurveda, Homeopathy, Siddha, Unani, and other healing practices—offers promising opportunities to integrate computational innovation with historically acquired knowledge of health, disease prevention, diagnosis, and therapeutics. This abstract focuses on the major AI tools used in traditional medicine

and the merits they offer for clinical care, medicinal-plant research, pharmaceutical development, education, and healthcare planning.

Methodology: Machine learning, image-based systems, Natural Language Processing (NLP), deep learning, quantitative Structure–Activity Relationship (SAR) models, molecular docking, network pharmacology, multi-omics analysis, and AI-powered pharmacovigilance were considered for their applications in traditional medicine. Their potential roles in clinical decision-making, medicinal-plant identification, raw-material authentication, knowledge preservation, drug discovery, safety evaluation, and healthcare delivery were reviewed.

Result and Discussion: Machine learning can recognize and establish a relationship between symptoms, pulse pattern, tongue appearance, skin conditions, facial characteristics, lifestyle factors, and treatment outcomes. In Ayurveda, machine-learning models can support the classification of Prakriti, disease patterns, and treatment selection. Image-based systems can assist in the identification of medicinally valued plants by examining morphological and microscopical characteristics and can help distinguish closely related or adulterated botanical species. Computer screening can also be effective for authentication of raw materials, detection of foreign matter, and assessment of quality, purity, and manufacturing consistency. Natural Language Processing (NLP) models can convert traditional medical manuscripts, historical literature, case records, and ancient herbal medicine reference books into searchable digital resources. They can translate multilingual texts, give information about plants and formulations, identify therapeutic indications, and review scientific literature. Knowledge preservation can document valuable information from native and local communities for research and education, provided that consent, proprietorship, confidentiality, and benefit-sharing are respected. NLP can also bridge research gaps and link traditional claims with pharmacological, toxicological, and clinical evidence. AI supports discovery and safety evaluation of drugs through deep learning, SAR models, molecular docking, network pharmacology, and multi-omics analysis. These tools can help select promising bioactive compounds, predict pharmacological activity, explore mechanisms of action, and perceive toxicological risks, reducing the time and expenditure required for preliminary screening of medicinal plants and traditional formulations. AI-powered pharmacovigilance can analyze electronic health records, social-media reports, pathological data, and case reports to detect possible adverse reactions, incompatibility, or herb–drug interactions at an early stage. Mobile applications, teleconsultation, chatbots, and virtual assistants can extend healthcare benefits to remote and underserved populations through personalized health monitoring, reminders, symptom tracking, referrals, and decision-support tools.

Conclusion: The unified use of AI with traditional medicine caters opportunities to improve clinical care, medicinal-plant research, drug discovery, formulation development, knowledge preservation, and accessibility of healthcare services.

Keywords: Artificial Intelligence, Traditional Medicine, Machine Learning, Natural Language Processing, Drug Discovery



Formulation and Evaluation of Trans Labial Biostrip of Glipizide

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Background: Trans labial drug delivery is an alternative route for achieving sustained and consistent drug levels. It offers several advantages, including avoidance of first-pass metabolism, improved patient compliance, and reduced risk of dose dumping. The present investigation aimed to develop a bio adhesive strip for trans labial drug delivery using a novel biopolymer isolated from the ripe fruit pulp of *Prunus armeniaca* (Armenian plum), belonging to the family Rosaceae. Natural biopolymers are increasingly being explored as pharmaceutical excipients because of their advantages over synthetic polymers, including low toxicity, low cost, biocompatibility, biodegradability, and better acceptability.

Methodology: The biopolymer was isolated from the ripe fruit pulp of *Prunus armeniaca* using a simple and economical extraction process. The isolated biopolymer was subjected to phytochemical, physicochemical, and morphological characterization. Five formulations (F1–F5) of glipizide bioadhesive strips were prepared using varying concentrations of the isolated biopolymer along with sodium alginate, sodium carboxymethyl cellulose, and dextrose. The strips were prepared by the solvent-casting method. The prepared formulations were evaluated for physical appearance, weight uniformity, content uniformity, folding endurance, in-vitro drug release, ex-vivo skin permeation, and release kinetics.

Results: The prepared glipizide bioadhesive strips exhibited satisfactory physical characteristics. The evaluated parameters, including physical appearance, weight uniformity, content uniformity, and folding endurance, were found to be within acceptable limits. The in-vitro drug release and ex-vivo skin permeation studies demonstrated the potential of the formulations for sustained drug delivery. Kinetic analysis was also performed to determine the drug-release mechanism.

Discussion: The findings indicate that the biopolymer isolated from *Prunus armeniaca* fruit pulp possesses promising characteristics as a natural pharmaceutical excipient for the development of translabial bioadhesive drug delivery systems. Its biocompatibility, biodegradability, low cost, and ease of isolation make it a potential alternative to synthetic polymers. The developed glipizide bioadhesive strips may therefore provide a promising approach for sustained drug delivery through the translabial route.

Keywords: Translabial drug delivery, Sustained release, Biopolymer, *Prunus armeniaca*, Glipizide, Bioadhesive strip, Folding endurance.



Artificial Intelligence in Pharmacy: Transforming Drug Discovery and Patient Care

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Background: The pharmaceutical industry is undergoing a significant transformation with the advent of Artificial Intelligence (AI) which is bringing in new and sophisticated methods for drug discovery, development and patient care. The traditional drug discovery process is typically time-consuming, expensive, and has a significant failure rate. AI technologies, such as machine learning, deep learning, and predictive analytics, can process vast and intricate datasets to discover possible drug candidates, forecast drug–target interactions, tweak molecular structures, and aid in the prediction of drug safety and efficacy. These applications can be used to speed up the initial stages of drug development and enhance decision making.

Methodology: AI can assist in medication management, drug–drug interaction detection, adverse drug reaction monitoring, dose optimization, medication adherence, and personalized therapy in clinical and community pharmacy practice. AI-powered clinical decision-support systems can assist pharmacists and other healthcare professionals in analyzing patient-specific information and selecting appropriate therapeutic options. Moreover, AI can play a role in pharmacovigilance by identifying safety signals from vast healthcare data sets.

Result, Discussion and Conclusion: While AI has the potential to bring significant benefits, there are also challenges to implementation, including data privacy and security, algorithmic bias, limited data quality, lack of transparency, and the need for proper regulatory and ethical frameworks. Thus, AI should be used in conjunction with, not in place of, the expertise of pharmacists and healthcare professionals. In conclusion, the synergy between AI and pharmaceutical sciences and clinical pharmacy holds promise for greater efficiency, faster drug discovery, improved patient safety, and personalized care.

Keywords: Artificial Intelligence, Machine Learning, Drug Discovery, Clinical Pharmacy, Personalized, Medicine, Pharmacovigilance, Patient Care.

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A Review on Artificial Intelligence in Novel Drug Delivery Systems and Nanomedicine Design

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Background: Artificial Intelligence (AI) is a rapidly growing field that is increasingly influencing daily life and healthcare. AI plays an important role in pre-diagnosis, diagnosis, treatment management, post-diagnosis, and the development of machines involved in diagnosis and treatment. In pharmaceutical sciences, AI is transforming the development of novel drug delivery systems (NDDS) and nanomedicines through predictive and data-driven approaches. Machine learning (ML), deep learning (DL), artificial neural networks (ANNs), Bayesian optimization, and generative approaches are emerging as powerful tools for improving formulation development and nanomedicine design.

The development of NDDS and nanomedicines has transformed modern pharmaceutical science by enabling controlled drug release, improved bioavailability, site-specific targeting, and delivery of therapeutic modalities that are difficult to administer conventionally. Conventional formulation development largely depends on trial-and-error experimentation, which is time-consuming and resource-intensive and may not adequately capture complex relationships among formulation variables, physicochemical characteristics, and biological performance. AI provides a predictive and data-driven approach to overcome these limitations. It can contribute to nanomedicine design by predicting nanoparticle size, surface charge, cellular uptake, protein adsorption, transfection efficiency, tissue distribution, and toxicity.

Methodology: AI-based approaches, including ML, DL, ANNs, Bayesian optimization, and generative methods, can be applied to nanomedicine and drug delivery development. These approaches analyze formulation and biological data to identify relationships between physical, chemical, and biological properties and therapeutic performance. Rational nanocarrier design uses these approaches to optimize properties such as particle size, surface charge, and stimuli responsiveness. Predictive pharmacokinetic and ADMET modelling can forecast how a drug candidate is processed by the body and support early identification of unsafe or poorly absorbed compounds. AI can also support controlled and stimuli-responsive drug release and microfluidic fabrication involving precise manipulation of small fluid volumes.

Results, discussion and conclusion: AI has significant potential across major areas of nanomedicine. Rational nanocarrier design can improve pharmacokinetic properties, enhance cellular uptake, and minimize off-target toxicity. Predictive pharmacokinetics and ADMET assessment can support early screening and potentially reduce time and resource requirements in drug discovery. Controlled and stimuli-responsive delivery systems can release therapeutic payloads in response to specific internal or external signals, thereby improving precision and minimizing side effects. Microfluidic fabrication can enable precise manipulation of fluids through sub-millimeter

channels, with methods including PDMS-based soft lithography and thermoplastic materials such as PMMA and COC. Overall, AI-driven predictive and data-based strategies have strong potential to improve the efficiency, precision, and effectiveness of NDDS and nanomedicine development.

Keywords: Artificial intelligence, machine learning, nanomedicine, novel drug delivery systems, deep learning, biocompatibility, microenvironments, microfluidic, triggered.



Pharmacovigilance: Ensuring the Safety of Medicines

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Background: Medicines play an essential role in the prevention, diagnosis, and treatment of diseases. Although medicines provide significant therapeutic benefits, they may also cause unwanted and harmful effects known as adverse drug reactions (ADRs). Pharmacovigilance is the science and activities concerned with the detection, assessment, understanding, and prevention of adverse effects or other medicine-related problems. Effective pharmacovigilance helps in identifying previously unknown or rare adverse reactions and contributes to the safe and rational use of medicines. Pharmacists are important healthcare professionals in this process because of their knowledge of medicines, patient counselling, and regular interaction with patients and other healthcare professionals.

Methodology: This abstract presents an overview of the role of pharmacovigilance in improving medication safety, with particular emphasis on the contribution of pharmacists. Relevant information was considered from standard pharmacovigilance concepts, adverse drug reaction monitoring practices, and the role of healthcare professionals in adverse drug reaction reporting. Key areas considered include identification of suspected ADRs, documentation and reporting, patient counselling, medication review, and communication with healthcare professionals. The importance of developing awareness among patients and healthcare professionals regarding ADR reporting was also considered.

Result and Discussion: Pharmacovigilance provides an important mechanism for continuously monitoring the safety profile of medicines after their use in the general population. Spontaneous ADR reporting can help identify potential safety signals that may not have been detected during clinical trials because clinical trials generally involve selected patient populations and controlled conditions. Pharmacists can contribute significantly by identifying suspected ADRs, collecting relevant patient and medication information, encouraging appropriate reporting, and educating patients about the safe use of medicines. Improved ADR reporting can support early identification of safety concerns and help healthcare professionals make better-informed decisions regarding

medication therapy. Pharmacists can also promote medication adherence, identify possible drug-related problems, and educate patients about the importance of reporting unusual or unexpected effects associated with medicines. Therefore, strengthening the participation of pharmacists in pharmacovigilance can improve medication safety and support better patient care.

Conclusion: Pharmacovigilance is an essential component of modern healthcare and plays a major role in ensuring the safe and effective use of medicines. Pharmacists can act as an important link between patients, healthcare professionals, and pharmacovigilance systems. Increasing awareness, improving ADR reporting practices, providing patient counselling, and encouraging active participation of pharmacists can strengthen medicine-safety monitoring. A strong pharmacovigilance system ultimately contributes to safer medication use and improved quality of patient care.

Keywords: Pharmacovigilance; Adverse Drug Reactions; Medication Safety; Pharmacists; ADR Reporting



New Frontiers in *H. pylori* Treatment: Enhancing Outcomes with Advanced Gastro-Retentive Drug Delivery Systems

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Abstract:

Helicobacter pylori, identified in 1982, infects more than half of the global population and is a major etiological factor in gastrointestinal disorders, including chronic gastritis and peptic ulcers, and is associated with an increased risk of gastric cancer. Persistent infection induces chronic gastric inflammation through host immune responses and bacterial virulence factors such as VacA and CagA, which contribute to mucosal damage. Conventional eradication therapy commonly involves combination regimens containing a proton pump inhibitor and antibiotics; however, treatment efficacy is increasingly compromised by poor gastrointestinal drug retention, short drug half-lives, rapid drug elimination, and antibiotic resistance. This review evaluates the pathophysiology of *H. pylori* infection, its interaction with the gut microbiota, and currently available conventional and alternative treatment approaches. Particular emphasis is placed on gastro-retentive drug delivery systems (GRDDS) as a potential strategy for improving drug residence time in the gastrointestinal tract and enhancing local drug exposure. Relevant clinical trials and reported therapeutic approaches for *H. pylori* eradication were also reviewed to assess their potential efficacy and limitations.

The reviewed literature indicates that conventional antibiotic-based therapies may be limited by increasing antimicrobial resistance, inadequate drug exposure at the site of infection, and rapid gastrointestinal transit. Gastro-retentive drug delivery systems offer the potential to prolong gastric residence time, improve drug release and absorption, and maintain therapeutic drug concentrations at the site of *H. pylori* colonization. Combination therapy incorporating gastro-retentive systems may therefore provide an alternative approach for improving eradication outcomes while potentially reducing treatment-related limitations. Clinical studies further demonstrate continued efforts to develop and optimize therapeutic strategies against *H. pylori* infection.

The complex interaction between *H. pylori*, gastric physiology, antimicrobial resistance, and the gut microbiota highlight the need for more effective and targeted treatment strategies. GRDDS may address some limitations of conventional oral therapy by prolonging gastric retention and facilitating sustained drug delivery directly to the stomach. Such systems could improve therapeutic efficacy and patient compliance; however, their clinical effectiveness depends on formulation design, gastric retention characteristics, drug release profiles, patient variability, and the evolving antimicrobial resistance pattern of *H. pylori*. Further clinical investigation is required to establish their comparative efficacy and safety.

Gastro-retentive drug delivery systems represent a promising approach for enhancing the treatment of *H. pylori* infection by increasing gastric residence time and potentially improving local and sustained drug exposure. Integrating GRDDS with appropriate combination antimicrobial therapy may help overcome some limitations of conventional treatment. Further formulation development and well-designed clinical trials are warranted to determine their potential role in improving *H. pylori* eradication and treatment outcomes.

Keywords: *H. pylori*, Gut Microbiota, Gastro-retentive Drug Delivery System, Combination Therapy, Antimicrobial Resistance, Clinical Trials

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A Review on AI in Healthcare: Transforming Diagnostics, Treatment & Patient Care

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Abstract:

Artificial Intelligence (AI) has become increasingly important in healthcare, particularly in diagnostics, treatment management, predictive analytics, patient engagement, and telehealth. Although concerns exist that AI may replace healthcare professionals, research indicates that it can complement clinical expertise, support decision-making, improve diagnostic accuracy, and increase treatment efficiency. AI can analyze large volumes of structured and unstructured healthcare data,

identify disease patterns, assist in early detection, predict outcomes, and support personalized treatment. However, challenges involving data availability, algorithmic limitations must be addressed.

AI is increasingly integrated into healthcare through large medical databases that provide practitioners with rapid access to diagnostic information. By analyzing patient symptoms, genetic characteristics, clinical records, laboratory results, and imaging, AI can assist clinicians in identifying conditions more efficiently. Rather than replacing physicians, AI is more likely to enhance human judgment and support evidence-based clinical decisions. AI is also expected to transform the healthcare workforce by encouraging preventive care and early intervention. Healthcare professionals will require greater knowledge of data analytics.

AI applications process both structured and unstructured healthcare data. Structured data, including symptoms, medications, physical examination findings, laboratory results, diagnostic images, and genetic information, can be analyzed using Machine Learning (ML), Neural Networks, and Deep Learning. Unstructured information, such as clinical notes, laboratory reports, and speech-to-text records, can be processed using Natural Language Processing (NLP).

Machine learning identifies patterns within patient datasets and can generate predictions or classifications. Neural networks can combine multiple variables to improve disease detection. Deep Learning uses multilayer neural networks to process complex information and narrow potential diagnoses.

AI provides targeted diagnostic support across several major disease areas. In stroke detection, AI-based systems can identify abnormal physical activity and trigger earlier imaging. One reported study achieved 87.6% accuracy in diagnosis and prognosis evaluation, while machine learning demonstrated approximately 70% accuracy in predicting recurrent stroke within 48 hours after an initial stroke.

AI has also been used to predict acute kidney injury up to 48 hours earlier than traditional methods, potentially allowing earlier intervention. In cancer care, AI platforms can analyze patient data, imaging, treatment quality, and outcomes to support radiation-treatment decisions. AI applications can improve patient engagement through personalized recommendations and reminders while identifying potential treatment non-adherence. Despite these benefits, adoption is limited by insufficient data, algorithmic complexity, lack of transparency, privacy concerns, regulatory uncertainty.

AI has significant potential to improve healthcare by supporting clinical decisions, enabling early detection, facilitating personalized treatment, and increasing efficiency. Its successful implementation should emphasize collaboration between healthcare professionals and AI rather than replacing human clinical judgment. Responsible adoption supported by quality data, appropriate regulation, workforce training, and secure technology can contribute to more proactive, accurate, personalized, and efficient healthcare.

Keywords: Artificial Intelligence, AI in Healthcare, Healthcare Technology, Machine Learning, Deep Learning, Natural Language Processing, Clinical Decision Support, Telehealth.



Remote Patient Monitoring and Home-Based Care for Improved Chronic Disease Management

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Abstract:

Remote patient monitoring and home-based care are becoming increasingly important in modern healthcare as systems search for ways to improve access, reduce hospital burden, and provide more continuous support to patients. These approaches are especially valuable for people living with chronic illnesses such as diabetes, hypertension, heart failure, chronic obstructive pulmonary disease, and asthma. Such conditions often require regular follow-up, repeated measurement of vital signs, and timely adjustments in treatment. In many situations, frequent hospital visits can be difficult for patients because of travel distance, cost, physical weakness, work responsibilities, or family duties. Home-based care and remote monitoring offer a practical solution by allowing patients to receive medical support while remaining in their own homes. This model not only improves convenience but also helps healthcare professionals identify problems earlier and respond before the condition becomes severe.

The present study is based on a narrative review of current practices in remote patient monitoring and home-based healthcare delivery. The approach includes the use of simple digital devices and mobile health tools that can be operated at home by patients or their caregivers. Common examples include blood pressure monitors, glucometers, pulse oximeters, digital thermometers, wearable sensors, and smartphone applications. These tools make it possible to record daily health information and share it with doctors, nurses, or care teams through digital platforms. For example, an older adult with hypertension may measure blood pressure every morning before breakfast and send the readings to a clinic. If the values remain high for several days, the healthcare provider can advise dietary changes, medication adjustment, or an early review. Similarly, a patient with diabetes can monitor blood sugar at home, helping to avoid sudden complications and supporting better self-care. This method represents a simple and patient-friendly way of connecting daily life with medical supervision.

Remote patient monitoring improves early detection of worsening symptoms, support timely clinical intervention, and reduce unnecessary hospital visits. It also encourages patients to become more active in managing their own health, which may improve treatment adherence and long-term outcomes. From a daily life perspective, the model reduces stress for patients and families because routine care can happen without repeated travel to hospitals or clinics. For example, a person recovering after surgery can rest at home, continue normal family interaction, and still be observed by the care team through regular digital updates. This is especially helpful for elderly patients, people with mobility problems, and individuals living in remote areas where healthcare facilities may be limited. In addition, home-based care can reduce pressure on hospitals by reserving in-

person services for patients who truly need urgent attention. Overall, the approach promotes safety, comfort, and continuity of care.

By improving access, supporting early intervention, and reducing avoidable hospital visits, remote monitoring and home-based care can strengthen health outcomes while making care more convenient for patients and families. As healthcare continues to evolve, these models are likely to play an increasingly important role in building a more connected, efficient, and compassionate system of care.

Keywords: Healthcare, Patient Monitoring, Glucometers, Hypertension, Remote Patient Monitoring



Water Fluoride Levels and Dental Fluorosis Prevalence among Indian School Children: A Synthesis of Evidence

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Background: Fluoride, the most electronegative halogen, occurs naturally in groundwater as fluoride ions are released by weathering of fluoride-rich rocks. At trace concentrations of 0.5-1.5 mg/L, it is beneficial for enamel remineralization, but chronic exposure above 1.0-1.5 mg/L during tooth development (typically <8 years) leads to dental fluorosis, an irreversible mottling of enamel ranging from white opacities to brown stains and pitting as graded by Dean's Index. India is among the most fluoride-affected countries, with more than 66 million people at risk. States including Rajasthan, Haryana, Gujarat, Andhra Pradesh and West Bengal repeatedly report high groundwater fluoride. While water-quality monitoring data are available, epidemiological coverage is uneven. Prior work in Rajasthan has focused on Central Rajasthan, Northern Rajasthan, Nagaur and industrial Jaipur, leaving fluoride-endemic blocks such as Sambhar block of Jaipur district without a dedicated field study despite similar geogenic and anthropogenic risk factors.

Methodology: A structured narrative synthesis was conducted. Literature was searched across PubMed, Scopus and Google Scholar for studies published between 2009 and 2023 using keywords fluoride, drinking water, groundwater, dental fluorosis, school children, and India. Reference lists were manually screened. Inclusion criteria were (a) measured fluoride concentration in drinking water sources and (b) clinically assessed prevalence of dental fluorosis in school-age population using Dean's Index. Nineteen epidemiological studies and two contextual reviews formed the evidence base. Data extracted were author, year, location,

sample size, age group, fluoride range and key finding. Due to heterogeneity, quantitative meta-analysis was not undertaken; instead, a narrative synthesis grouped by geographic region was performed.

Result and Discussion: Prevalence ranged from ~12% in non-endemic villages of Una, Himachal Pradesh to 94.85% in high-fluoride villages of Jhajjar, Haryana, and 51.9% in Rohtak where fluoride ranged 0.532-8.802 mg/L. In Vadodara, Gujarat, prevalence was 59.3% in high-fluoride versus 39.2% in normal-fluoride villages. In Durg, Chhattisgarh it was 18.75%. Bankura, West Bengal reported fluoride up to 9.15 mg/L. Rajasthan emerged as persistently high-risk, with industrial Jaipur showing contamination linked to untreated effluents. Critically, similar fluoride concentrations produced 2–3-fold differences in prevalence, indicating effect modification by nutritional status, calcium intake, toothpaste swallowing behavior, indoor wood-stove use and health-literacy gaps. International studies from Iran, China and Colombia supported this pattern.

Conclusion: Evidence confirms a consistent, concentration-dependent association between drinking-water fluoride and dental fluorosis among Indian school children, moderated by nutrition, behaviour and awareness. Rajasthan remains most affected, yet evidence is geographically skewed, leaving blocks like Sambhar unstudied. The synthesis supports the need for integrated, block-level cross-sectional studies combining water testing with clinical examination and assessment of covariates to prioritize defluoridation and health-literacy interventions.

Keywords: Fluoride, Drinking Water, Dental Fluorosis, School Children, and Rajasthan



Green Synthesis of Nanoparticle Using Different Plant Extract

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Abstract:

The present internship work focuses on the green synthesis and characterization of zinc oxide nanoparticles (ZnO NPs) using *Amaranthus tricolor* leaf extract. Green synthesis is an environmentally sustainable approach that employs biological material as alternative to hazardous chemical reducing and stabilizing agents. Plant derived photochemical serve as natural reducing and stabilizing agents. Since phytochemicals obtained from plants function as natural reducing and stabilizing agents, the process of synthesizing nanoparticles is simple, inexpensive, and environmentally friendly. Flavonoids, phenols, alkaloids, and terpenoids all play a role in reducing metal ions and in stabilizing the nanoparticles.

This technique decreases the need for toxic chemicals and helps to minimize environmental pollution. The phytochemicals also affect the size, shape, and stability of the nanoparticles produced, which is why plant-based synthesis represents a promising strategy for sustainable nanotechnology. In this study, ZnO NPs were synthesized using aqueous extract of *Amaranthus tricolor* leaves and Zinc salt as precursor, while sodium hydroxide (NaOH) was used to create alkaline conditions and to help bring about the formation of the zinc-containing precipitate. The synthesized nanoparticle was purified dried and subjected to physio-chemical characterization. The prepared nanoparticle were characterized X-Ray diffraction (XRD) to determine their functional group and crystalline structure.

The characterization results were interpreted in relation to established ZnO structural and optical characteristics and compared with relevant published literature. The properties of nanoparticle depend on the plant species, extract concentration, precursor ratio, PH, temperature and reaction time. Green synthesized nanoparticle has considerable potential for applications in antimicrobial treatment, photo-catalysis, environmental remediations, biosensors, agricultural and biomedical research. The study demonstrates the practical application of a plant-mediated approach for ZnO nanoparticle synthesis and provides an understanding of the relationship between synthesis conditions and nanoparticle properties.

Keywords: Nanotechnology, Green synthesis, nanomaterials, Zinc oxide, *Amaranthus tricolor* leaf extract, phytochemicals



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Invited Lecture-1**Artificial Intelligence for Smart and Resilient Societies****Dr. Nimay Kalyani****Affiliation:**

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About:

Nimay Kalyani is an international higher education executive, transnational education specialist and institutional growth leader with more than 20 years of experience spanning university leadership, internationalisation, business transformation, governance, strategic partnerships and cross-border education across Australia, India and the Asia-Pacific region.

He currently serves as Campus Director and Head of Institution for the University of Wollongong India, one of India's pioneering International Branch Campuses established under the country's transnational education framework. As the founding leader of the campus, Nimay led the institution from regulatory approval and establishment through commissioning, operational launch and growth, with responsibility for strategy, governance, academic operations, financial stewardship, student recruitment, stakeholder engagement and long-term institutional sustainability.

Prior to his current role, Nimay served as Project Director – Commissioning for the University of Wollongong India and held academic and international leadership appointments at the University of Newcastle, Australia, where he led partnership development, internationalisation initiatives and transnational education collaborations across South Asia. Throughout his career, he has developed and managed strategic partnerships across higher education, industry and government sectors, supporting student mobility, employability, research collaboration and institutional growth.

Nimay's professional experience extends beyond higher education into business leadership, market intelligence, organisational transformation and entrepreneurship. He has led large-scale business improvement initiatives, managed multi-million-dollar budgets, advised organisations across multiple sectors and successfully established and scaled businesses in healthcare and international trade.

A recognised contributor to the international education sector, Nimay actively engages with government agencies, regulators, industry bodies and academic institutions to advance the role of international higher education in economic development, workforce capability and innovation. He serves on advisory committees and industry forums and is a regular speaker on topics including transnational education, international branch campuses, higher education strategy, university-industry partnerships, student employability, institutional growth and the future of global education.

Nimay holds a Master of Business Administration, Master of Applied Finance, Graduate Certificate in Investment Analysis and a Bachelor of Engineering. He is also a Project Management Professional (PMP), Six Sigma Master Black Belt and published author.

Areas of Expertise:

International Branch Campuses • Transnational Education • Higher Education Strategy • Institutional Leadership • Internationalisation • Student Recruitment & Growth • University-Industry Partnerships • Governance & Regulatory Engagement • Academic Operations • Financial Stewardship • Organisational Transformation • Cross-Border Education

Abstract**Artificial Intelligence for Smart and Resilient Societies****Nimay Kalyani***Corresponding Email ID: campusdirector-india@uow.edu.au***Abstract:**

Artificial Intelligence is changing the way we live, learn, work, and connect with one another. From helping doctors deliver better care and cities manage resources more efficiently to supporting faster responses during crises, AI is becoming an increasingly important part of how societies solve complex challenges. Yet the real promise of AI is not simply in making systems more efficient. It lies in its ability to help people build stronger, more adaptable, and more resilient communities.

This presentation explores how AI can be harnessed to address some of the most pressing issues facing our world today. Whether responding to climate-related events, improving public services, strengthening healthcare systems, or expanding access to education, AI has the potential to help us make better decisions, use resources more effectively, and anticipate challenges before they become crises.

Through real-world examples and emerging global practices, the session will highlight how governments, universities, industries, and communities are using AI to navigate uncertainty and create new opportunities. At the same time, it will acknowledge an important reality: technology alone cannot build resilient societies. The decisions we make about how AI is designed, governed, and deployed will ultimately determine whether its benefits are shared broadly and equitably.

As AI becomes more deeply embedded in our everyday lives, questions of trust, ethics, transparency, workforce readiness, and inclusion become increasingly important. We must ensure that AI remains a tool that empowers people, complements human judgement, and expands opportunity rather than creating new forms of exclusion.

At its heart, this presentation is about people. It is about how we can harness one of the most powerful technologies of our time to create societies that are not only smarter, but also more connected, sustainable, inclusive, and resilient. The future of AI will not be defined by what technology can do, but by what humanity chooses to do with it.

Keywords: Universities, Industries, Communities, AI, Human Judgement



Invited Lecture-2**AI Innovation in Computer Science: Powering Education, Industry, and Society****Dr. Ritu Bhargava**

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Research Professional Areas of Interest: Medical Imaging, Data Science, Artificial Intelligence, Machine Learning.

Educational Qualifications

- Ph.D., Hemachandracharya North Gujarat University, Patan, Gujarat, India
- M.Phil. (Computer Science), Alagappa University, Karaikudi
- MCA, Maharshi Dayanand University. Rohtak
- Certificate Course in AI & Machine Learning from E & ICT Academy IIT Kanpur

Professional Experience

- Associate Professor, Department of Computer Science, Sophia College (Autonomous), Ajmer; 23+ years teaching/Research experience

Key Achievements

- Coordinator, Digital Learning Center
- Coordinator, Training & Placement Cell
- Editorial Board Member, ICCI -25, International Conference on Computing and Innovation
- Has organized conferences/workshops and contributed as keynote speaker
- Awarded Outstanding Academician of the Year in the International Conference UNI-TEAS powered by Springer.
- Life member of CSI

- Member of ACM
- Member of ACM
- Academic Advisor NCSSS (National Cyber Safety and Security Standards)

Publications:

- Artificial Intelligence and Data Mining in Security Frameworks, Scrivener Publishing, Wiley.
- Fundamental of Information Technology, University Book House, Jaipur Rajasthan India ISBN 978-81-8198-297-1.
- Fundamental of Multimedia, University Book House, Jaipur Rajasthan India ISBN 978-81-8198-250-1.
- PC Software, University Book House, Jaipur Rajasthan India ISBN 978-81-8198-124-3.
- A Book on C Programming Language, University Book House, Jaipur. ISBN 978-81-8198-297-2.
- Books are also written for VMOU, Kota, RBSE

Abstract**AI Innovation in Computer Science: Powering Education,
Industry, and Society****Ritu Bhargava***Sophia College (Autonomous), Ajmer-India**Corresponding Email ID: ritu@sophiacollegeajmer.in***Abstract:**

Artificial intelligence has moved from a specialized research area within Computer Science into a set of tools that shape everyday life, industry practice, and public policy. This talk traces that movement by showing how a single technical pipeline, from raw data through algorithms and trained models to working applications, underlies examples drawn from education, engineering, agriculture, healthcare, and government initiative. The session opens by asking listeners how many times AI already touched their day, through face recognition, route prediction, content recommendation, and text correction, connecting these tools to their underlying disciplines: machine learning, deep learning, natural language processing, and computer vision.

The talk then covers sector applications. In education, adaptive platforms and tutoring tools personalise pace and content, while automated grading reduces faculty workload. In industry and engineering, predictive maintenance, generative design, and coding assistants such as GitHub Copilot and Claude Code are changing how software and hardware are built. In agriculture, drone

imaging, phone-based disease detection, and precision input recommendations are changing how farmers manage crops. In healthcare, diagnostic models assist in reading medical images, computational methods narrow candidate compounds during drug discovery, and wearable devices support continuous monitoring.

A policy section places these developments within the Indian government's approach to national AI capacity, referencing the compute, dataset, skilling, and startup financing pillars of the IndiaAI Mission, along with the Indian Institute of Creative Technology, which targets animation, visual effects, gaming, comics, and extended reality. This section highlights an approach that favours building infrastructure and skills ahead of heavy regulation.

A technical segment introduces the distinction between large and small language models, explaining that large models trained on internet scale text offer broad reasoning at higher computational cost, while small models, fine-tuned for a single task, can match or exceed large model performance on narrow business problems at a fraction of the cost and latency.

The talk is based on four directions: systems that act on behalf of users, models that run efficiently on low-cost or offline devices, collaborative arrangements between professionals and AI tools, and language models built to serve local languages and regional priorities. The narrative builds toward its ultimate proposition that whichever direction proves dominant, the foundational discipline of Computer Science remains the constant training ground for those who will build what comes next.

Keywords: Artificial Intelligence, Computer Science Education, Machine Learning Applications, Language Models, AI Policy



Invited Lecture-3

**Building the AI-Powered Economy:
Innovation, Strategy and Governance**



Dr. Vaishali Padake

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Areas of Interest: Her research interests include Exchange Rate determination, Informal Sources of finance, and Digital Financial Inclusion.

Educational Qualifications

- Ph.D Finance, SNDT University, 2019
- M.Sc. International Economics, Cardiff University, UK, 2003

Professional Experience

- Faculty Member, KJ Somaiya Institute of Management, Mumbai, 13 years
- Economist, Research Analyst, 10 yrs

Selected Publications / Patents / Books (Maximum 5)

- ROSCA, paving the way for Financial Inclusion by the informal sector in India. The 7th Asia Conference on Business and Economic Studies (ACBES 2025), University of Economics Ho Chi Minh City (UEH), Vietnam, August 2025.
- Influence of Shopping Motivation and Impulse Buying Behaviour on the Commercial Activities at the Airport: Evidence from India (with Kanabar). Annals of the University Dunarea de Jos of Galati: Fascicle: I, Economics & Applied Informatics, 2022, 28(1).
- Gender Behaviour towards Behavioural Biases in Investment Decision Making during COVID-19. Empirical Economics Letters, Vol. 20 (Special Issue 4 - 2021
- Implementation of ICT for Supply Chain Management by the Large and MSME Indian Pharmaceutical Manufacturing Firms (with Kanabar), Annals of “Dunarea de Jos” University of Galati Fascicle I. Economics and Applied Informatics, 2019, page 37-42.

Abstract**Building the AI-Powered Economy:
Innovation, Strategy and Governance****Vaishali Padake***KJ Somaiya Institute of Management, Mumbai**Corresponding Email ID: vaishali.padake@somaiya.edu***Abstract:**

When we talk about Artificial Intelligence, we often talk about ChatGPT, generative AI, robots, automation or the latest technology. But the speaker would like to view AI from a slightly different perspective - AI as an economic transformation. The session will address important concerns like how AI will change different sectors of our economy like agriculture, manufacturing and services. How will it change the nature of work and what will happen to existing jobs and professions? The session will enlighten students on what skills are required to sustain in this disruption. And how should businesses and governments govern this transformation? The session explores these questions through three broad areas that are innovation, strategy and governance but with a particular focus on something that concerns many of us in India that is the future of jobs. In agriculture, the impact of AI is likely to be more gradual and uneven. AI can help with weather forecasting, crop monitoring, pest detection, irrigation, soil analysis, crop-yield prediction and supply-chain decisions. Manufacturing and services have a much larger immediate potential for AI-driven transformation because so much of their activity is connected to machines, data, digital systems and information processing. AI in Manufacturing will shift from automation to intelligent manufacturing while the disruption in the services sector could be much bigger. The session discusses the opportunities and disruptions caused by the AI and conclude by highlight the changing job trends and what actions can bring the transformation to fulfil skill gap in the economy.

Keywords: Artificial Intelligence, ChatGPT, Transformation, Soil Analysis

Invited Lecture-4

Bridging Japan and India through International Education



Jiang Benguo

Chairman of the Board, Educational Corporation Hanazono Minami Gakuen, JAPAN

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Areas of Interest:

Japan–India International Human Resource Development and Exchange Programs

Educational Qualifications:

Faculty of Informatics, Kansai University, Graduated in March 1999

Key Achievements / Awards / International Collaborations

- Osaka College of Tourism and Business
- Osaka College of Tourism and Business Japanese Language School
- Japan Digital College

Abstract

Bridging Japan and India through International Education

Jiang Benguo

Educational Corporation Hanazono Minami Gakuen, Japan

Corresponding Email: info@octb.ac.jp

Abstract:

Osaka College of Tourism and Business (OCTB) is a career-focused vocational college located in Osaka, one of Japan's leading international cities. OCTB emphasizes **Career-Oriented Education**, providing practical skills and specialized knowledge in Tourism and Hospitality, Global Business, and International Communication.

OCTB is operated by Hanazono Minami Gakuen Educational Corporation, together with Japan Digital College and OCTB Japanese Language Academy. Approximately 2,000 international students' study across the group. Through International Education, we promote multicultural understanding and intercultural communication.

OCTB also promotes Innovation through continuous curriculum development and collaboration with industry. Every year, we support more than 400 international student graduates in building their careers. We aim to develop globally minded professionals who can succeed and contribute both in Japan and around the world.



Invited Lecture-5

Artificial Intelligence for Business and Management: A Supply Chain Management Perspective



Dr. Pratistha Mathur

Affiliation: Professor & Head (Department of Information Technology), SCSE, Manipal University, Jaipur, Rajasthan, India

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Academic Qualifications:

- Ph.D. (Comp. Sc.), 2012 from Banasthali Vidyapith
- M. Tech. (Comp. Sc.), 1998 From Banasthali Vidyapith, 83 %, I Position in Merit
- M. Sc. (Comp. Sc.), 1996 from Banasthali Vidyapith, 76%
- B. Sc.(Hons.), 1994 from Banasthali Vidyapith, 73%
- Sr. Secondary, 1991 from Board of Secondary Education, Rajasthan,70%
- Secondary, 1989 from Board of secondary Education, Rajasthan, 82%
- Qualify GATE-96 in Computer Science & Engineering, Percentile Score 79.19
- Qualify NET in Computer Science in 1996

Research work:

- Principal Investigator of Project titled “Joint Image compression and encryption for accuracy, reliability, and image quality in Telemedicine”, sanction on January 24, 2018 for a period of two year from DST, Rajasthan
- Ph.d. on topic “Generalised dynamic model for ANN Based Pattern Recognition ” under the supervision of Prof. G. N. Purohit, Dean, Department of Computer Science and Electronics, Banasthali Vidyapith
- Completed a two year major research project funded by ISRO under RESPOND Program titled “Dynamic Modelling for Pattern recognition Using Artificial Neural Networks.

- Completed a two year Minor Research project funded by UGC titled “Pattern Recognition, Signal Processing and Neural Networks”
- Working in field of Localization, associated with many sponsored project in the department like Online Web Based Development, CoIL NET, Gyan Udyog, Gyan Jyot etc.

Awards:

- Gold Medal in M.Tech (Comp. Sc.)
- Certificate of Merit in Secondary Education

Experience:

- Working as Professor in Department of IT, SCIT, Manipal University Jaipur, since October 2018
- Teaching in department of IT, SCIT, Manipal University Jaipur, as Associate Professor from July 25, 2016
- Worked as Associate Professor in Department of Computer Science, Banasthali Vidyapith from October 2012 to July 23, 2016.
- Worked as Assistant Professor in Department of Computer Science, Banasthali Vidyapith from July 1998 to September 30, 2012.
- During the period taught many theory papers to UG/ PG, conduct practical, seminars etc.

Publication:

- V. Keote, A. A. Joshi and P. Mathur, "Hybrid Deep Learning for Accident Detection with an Android-Based Alert System," 2025 International Conference on Emerging Techniques in Computational Intelligence (ICETCI), Hyderabad, India, 2025, pp. 1-6, doi: 10.1109/ICETCI67340.2025.11257950.
- A machine learning model for crop yield prediction using remote sensing data, K Jhajharia, NV Sharma, P Mathur - Int. Res. J. Multidiscip. Scope, 2025
- Mathur, S., Mathur, P. (2025). Leveraging Data Augmentation to Achieve Robust Multi-label Classification of Hindi News. In: Iglesias, A., Shin, J., Patel, B., Joshi, A. (eds) Information Systems for Intelligent Systems. ISBM 2024. Lecture Notes in Networks and Systems, vol 1255. Springer, Singapore. https://doi.org/10.1007/978-981-96-1747-0_16
- S. Tuli, V. K. Verma and P. Mathur, "Comprehensive Analysis of Mental Health Insights from Social Media: Taxonomies, Computational Methods, and Resources," 2024 15th International Conference on Computing Communication and Networking Technologies (ICCCNT), Kamand, India, 2024, pp. 1-8, doi: 10.1109/ICCCNT61001.2024.10725293.
- K Jhajharia, P Mathur, Machine Learning Based Crop Yield Prediction Model in Rajasthan Region of India. (2024). Iraqi Journal of Science, 65(1), 390-400.

Abstract**Artificial Intelligence for Business and Management: A Supply Chain Management Perspective****Pratistha Mathur***Corresponding Email ID: pratistha.mathur@jaipur.manipal.edu***Abstract:**

Artificial intelligence (AI) is becoming increasingly important in business and management. It assists businesses in making data-driven decisions, automating procedures, forecasting future events, and analysing complex data. Using supply chain management as an example application area, the study examines AI as an organizational capability to enhance business performance and presents a conceptual framework for AI-enabled business transformation. The framework for AI-powered business transformation comprises four essential components: business process optimization, intelligent decision support, stakeholder engagement, and organizational innovation and resilience. The framework makes use of information from external environmental sources, ERP and CRM systems, supplier databases, logistics systems, market data, Internet of Things (IoT) devices, and transaction data. ML, DL, NLP, and computer vision techniques can be used throughout the supply chain to identify patterns, forecast outcomes, identify anomalies, and facilitate well-informed decision-making. For instance, inventory optimization may choose the best stock levels and replenishment schedules, while demand forecasting may use AI to predict future product needs based on historical sales data, seasonal trends, promotions, and outside factors. Standard machine learning models, such as those used to analyse supplier performance, delivery history, quality data, and external risk indicators, can be used to identify potential disruptions. Predictive analytics and optimization have the potential to enhance resource utilization in transportation planning, forecast delivery times, and ascertain the most suitable routes. NLP-based systems have the capability to analyse customer feedback and facilitate intelligent customer-service operations. On the other hand, computer vision is applicable in warehouse operations, where it can be employed to identify inventory and identify errors.

Managers can generate forecasts, alerts, scenario analyses, and recommendations using AI- based managerial decision-making. However, ultimately, it is crucial for managers to evaluate the recommendations and make the final decision. Thus, the proposed framework emphasizes explainability, data governance, cybersecurity, human-AI collaboration, and responsible use of AI. AI-powered supply chain transformation can be evaluated using a number of metrics, including operational, financial, customer, resilience, AI performance, and adoption metrics.

Forecasting accuracy, inventory turnover, fulfilment rate, logistics cost, working capital efficiency, delivery reliability, recovery time from interruptions, model accuracy, false positive rate, user acceptance, and ROI are some of these. In order to provide an organized method of linking AI

capabilities to observable results, the framework considers the risks of forecasting problems, AI biases, privacy, cyber threats, and excessive automation. The study supports AI-enabled business transformation and serves as a foundation for empirical research in this field across a range of industries because the suggested framework conceptualizes the relationship between AI, management decision-making, and supply chain performance. Lastly, the results indicate that supply chains can become more effective, flexible, sustainable, and inventive by combining AI with human experience, process redesign, high- quality data, and sound governance.

Keywords: Artificial Intelligence; NLP; Operational; Financial; Customer; Resilience



Invited Lecture-6

Strengthening Global Knowledge Partnerships: India–Japan Collaboration for the Future of Higher Education and Research



Prof. (Dr.) Krishna Kant Dave

Affiliation: Group Vice Chancellor, Shri Venkateshwara University, Gajraula, Uttar Pradesh

Email ID: vc@svu.edu.in | Phone No.: +91- 9873986691

About:

A visionary academic administrator, financial expert, and institution builder with over 30 years of extensive experience spanning higher education leadership, academic research, and multinational corporate management. Currently serving as the Group Vice Chancellor at Shri Venkateshwara University, Prof. Dave specializes in Outcome-Based Education (OBE), driving institutional excellence, and steering universities toward rigorous accreditations like NAAC A++ and NBA.

Institutional Transformation:

Proven track record of heading major universities and academic councils. Previously served as President (Vice-Chancellor) at Pacific University in Udaipur and Vice-Chancellor at Bahra University in Shimla.

Corporate & Financial Acumen:

Brings deep industry expertise to academia, having successfully managed strategic financial planning, international finance, and fund management in the corporate sector prior to his academic leadership roles.

Notable Awards & Honors

- **Education Leadership Awards:** Two-time recipient (2011 and 2012) of the Education Leadership Award by KRDWG at IIT New Delhi, recognized for holistic education, quality leadership, and outstanding placement initiatives.
- **Teaching Excellence:** Honored with multiple "Best Teacher" awards by prominent organizations, including the Dainik Bhaskar Group (2009), ICAI Udaipur Chapter (2009), and Bharat Vikas Parishad (2014).
- **Corporate Recognition:** Recipient of the ICICI Pru Sprint Award for exceptional performance, as well as "Best Employee" and "Sincerity" awards during his corporate tenure.

Abstract**Strengthening Global Knowledge Partnerships: India–Japan Collaboration for the Future of Higher Education and Research****Krishna Kant Dave***Group Vice Chancellor, Shri Venkateshwara University, Gajraula, Uttar Pradesh**Email ID: vc@svu.edu.in***Abstract:**

In an increasingly interconnected world, higher education institutions have a vital role in fostering global partnerships, collaborative research, innovation, and meaningful academic exchange. India and Japan, with their rich cultural traditions, technological strengths, academic excellence, and shared commitment to knowledge, possess significant potential to deepen bilateral cooperation in higher education and research.

International conferences such as BICON provide an important platform for academicians, researchers, students, and institutions to exchange ideas, explore interdisciplinary perspectives, and develop sustainable academic partnerships. Such interactions can lead to joint research, faculty and student mobility, innovation, skill development, entrepreneurship, and solutions to emerging global challenges.

For students, participation in international conferences is a valuable experiential learning opportunity. It enables them to engage with distinguished scholars, observe global academic practices, develop confidence, broaden their perspectives, and cultivate a research-oriented mindset.

The future of higher education will depend increasingly on partnerships that move beyond formal agreements toward active collaboration, knowledge creation, and societal impact. India–Japan cooperation can make a significant contribution by combining innovation, technology, cultural values, and human-centered development.

BICON stands as a meaningful bridge connecting ideas, institutions, cultures, and young minds, transforming academic dialogue into enduring partnerships and future possibilities.

Keywords: India–Japan Collaboration, Higher Education, Research, Innovation, Internationalization, Global Partnerships



CONTRIBUTED PAPERS**Abstract****Ethical AI in Marketing: Balancing Innovation and Responsibility****Anupama Goyal***Jayoti Vidyapeeth Women's University Jaipur**Corresponding Email ID: goyalanupama29@gmail.com***Abstract:**

Artificial intelligence is transforming modern marketing by providing brands with strong tools to understand, predict, and shape how consumers behave with high accuracy. Marketers are using AI for tasks like creating content automatically, tailoring messages in real time, and targeting people based on predictions. These advancements allow marketers to connect with audiences in smarter and more effective ways. However, as AI becomes more powerful, there is a big responsibility to act ethically. With greater access to personal information and consumer behavior, the difference between useful personalization and harmful manipulation is getting harder to define. This paper looks at the ethical aspects of using AI in marketing. It starts by looking at the main AI tools used in customer interactions, such as tracking behavior, suggesting products, detecting emotions, and setting personalized prices. It then discusses how these tools can sometimes hurt consumer independence, privacy, and trust if not used carefully. The paper also covers real-world problems like biased algorithms, unclear decisions, fake videos, and the effects of highly targeted messages on people's psychology. To deal with these issues, the paper suggests an ethical framework based on values that combines creativity with responsibility. It says that ethical AI in marketing should not only follow rules but also follow ideas like being open, fair, getting permission, and being able to explain decisions. The framework also highlights the need for teamwork between marketing professionals, data experts, legal advisors, and ethicists when creating AI systems that treat people with respect. By looking at current practices and planning for the future, this study encourages companies to see ethical AI not as a limit but as an advantage. Using AI responsibly can help build a better reputation, create lasting relationships with customers, and prepare marketing efforts for the future in a world that values data more than ever. In the end, it urges marketers to think about a deeper question: not just what AI can do for marketing, but what marketing should represent in the age of AI.

Introduction: In recent years, the use of artificial intelligence (AI) in marketing has gone from being a new idea to something that's essential. As companies try to connect with customers in more meaningful and efficient ways, AI has become a strong tool that can look at huge amounts of data, predict what customers might need, create personalized experiences, and make decisions quickly. Whether it's through recommendation systems, predicting future trends, adjusting prices in real

time, or creating content with AI, the impact of smart systems on marketing is both deep and widespread (Chatterjee et al., 2020). However, as AI changes how brands communicate and connect with their audiences, a big question is also becoming more important—how can we make sure this innovation stays responsible, ethical, and in line with human values?

Marketing has always been about understanding people—what they want, how they act, and what motivates them. With AI, the ability to break down and predict these things has reached new heights. Tools like facial recognition, analyzing emotions from text or speech, and tracking online activity let marketers figure out feelings, intentions, and even hidden preferences (Paschen et al., 2020). While this level of understanding can be very useful, it also brings up important ethical concerns. Are customers really aware of how their information is being used? Do they know what their data is being used for? And more importantly, where does helpful personalization stop and manipulation begin? AI doesn't work on its own. The systems it uses are based on past data, which often includes the biases, unfairness, and assumptions that exist in the real world. If these biases are not addressed, they can lead to unfair ad targeting, unfair pricing, and echo chambers that spread stereotypes (Raji & Buolamwini, 2019). Also, as AI gets better at making fake content like deepfakes or made-up reviews, it puts brands in a tricky position because they rely on trust. This mix of technology, data, and human psychology needs a new way of thinking—one that doesn't just focus on results but also on being ethical and accountable.

Ethical issues linked to AI in marketing are not just ideas from books—they are happening more often and becoming harder to ignore. For example, the Cambridge Analytica case showed how consumer information was collected without proper permission to shape political decisions. There are also cases where pricing algorithms have unknowingly set higher prices for people in certain areas, which might be connected to race or income level (Martin & Murphy, 2017). These situations show how dangerous it can be to use AI tools without strong ethical rules in place. As AI gets more powerful, marketers need to take more care in how they use it.

Good news is that the conversation about using AI responsibly is growing. Many companies and groups are now talking about important ethical ideas like fairness, clear explanations, transparency, and only using the minimum necessary data (Floridi et al., 2018). In marketing, these ideas are especially important because marketing is all about influencing people. When AI's ability to predict and adapt is added to that, there's a bigger chance of unintentionally affecting consumers. That's why marketers need to think about ethics at every step—from gathering data to designing algorithms, creating messages, and analyzing responses.

Objectives of the study:

This study is motivated by the need to understand and address the evolving ethical challenges brought about by the growing use of artificial intelligence in marketing. As AI tools become more sophisticated and embedded in customer interactions, marketing strategies must evolve in a way that balances innovation with responsibility. In that spirit, the study sets out to achieve the following objectives.

- To explore how AI is currently being applied in marketing practices and to understand the nature of ethical concerns emerging from these applications, such as privacy invasion, algorithmic bias, and manipulative targeting.
- To propose a conceptual framework for ethical AI in marketing that helps marketers navigate the balance between personalisation, efficiency, and consumer autonomy, while adhering to principles like fairness, transparency, and accountability.
- To highlight the broader implications of ethical AI use in marketing, particularly in building consumer trust, enhancing long-term brand equity, and aligning technology with societal and regulatory expectations.

Research Methodology:

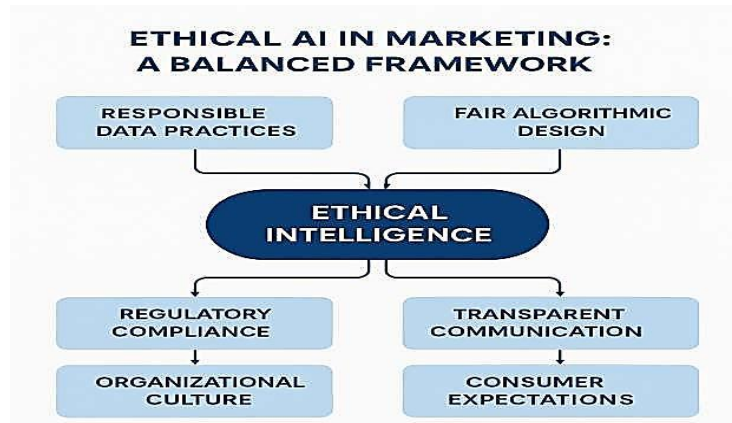
Given the exploratory and conceptual nature of this study, the research is grounded in a qualitative and interpretative approach. Instead of collecting primary data, this paper relies on secondary sources such as peer-reviewed journals, academic books, industry white papers, marketing reports, and thought leadership articles that discuss how artificial intelligence interacts with marketing strategies and ethical issues.

Relevant academic literature and industry case studies were reviewed to understand how AI is being used in marketing, with particular attention paid to examples that highlight ethical challenges—such as data misuse, biased algorithms, lack of transparency, and consumer manipulation. Insights from these sources were then synthesised to identify key ethical tensions and recurring themes. In addition, this study draws from existing frameworks in marketing ethics, AI governance, and consumer trust to develop a holistic conceptual model. These frameworks were examined and adapted to suit the context of AI-driven marketing, with an emphasis on contemporary digital environments where personalisation, automation, and real-time engagement are the norm. Particular care was taken to include diverse perspectives from different regions and sectors, ensuring that the discussion accounts for both global concerns and context-specific nuances. The conceptual framework proposed in this paper is thus built from a foundation of cross-disciplinary insights. It aims to serve as a guiding tool for marketers, technologists, and policy-makers who wish to integrate ethical thinking into the design and execution of AI-based marketing strategies.

Conceptual Framework: At the heart of the framework lies the principle of "Ethical Intelligence"—a guiding force that ensures AI tools are developed and deployed not only for commercial gains but also for the well-being of consumers and society. This core is supported by four interconnected dimensions:

- **Responsible Data Practices:** This dimension focuses on ethical data collection, informed consent, data minimisation, and fair use. It ensures that consumer data is not exploited and that privacy norms are respected.
- **Fair Algorithmic Design:** Marketers need to make sure AI models are trained on unbiased data and must be regularly audited to prevent discriminatory outcome

- **Transparent Communication:** Ethical AI involves honest and clear communication with consumers about the presence and role of AI in marketing processes. This includes disclosures in personalised ads, chatbots, and algorithm-driven recommendations.
- **Emotional and Psychological Sensitivity:** AI tools that assess sentiment or behavior must do so within ethical bounds. Emotional AI should empower rather than manipulate, offering meaningful engagement rather than exploitative targeting.



Results and Discussion: The integration of ethical intelligence into AI-powered marketing is no longer a theoretical concern—it is a strategic necessity. As the marketing ecosystem grows increasingly reliant on AI to interpret consumer behaviour, drive personalisation, and predict preferences, questions around fairness, transparency, and consent demand urgent attention. The conceptual framework presented underscores the importance of ethical intelligence as the guiding force for all AI-driven decisions in marketing. Today’s consumers are acutely aware of how their data is used. Marketers who engage in respectful data collection, secure handling, and transparent consent processes are more likely to retain consumer trust. When consumers feel in control of their data, they are more willing to engage, thus fostering stronger relationships. Conversely, breaches or opaque usage practices can erode brand credibility almost instantly.

Fair algorithmic design addresses the inherent biases that can creep into AI models. Left unchecked, these biases can lead to discriminatory targeting or exclusionary practices, particularly across gender, ethnicity, or socio-economic backgrounds. Incorporating fairness checks and inclusive datasets during model development can significantly improve the ethical performance of marketing algorithms. Regulatory compliance is not just about avoiding penalties but aligning with the broader social contract between brands and society. Laws such as GDPR, CCPA, and India’s Digital Personal Data Protection Act signal a clear shift towards prioritising individual rights. Businesses that include these principles into their AI models demonstrate foresight and responsibility.

Conclusion: The fusion of artificial intelligence and marketing presents both profound opportunities and ethical dilemmas. As marketers increasingly rely on intelligent algorithms to decode consumer behavior, recommend products, and personalize experiences, the importance of ethical responsibility becomes paramount. This paper has proposed a human-centric framework for

integrating ethical principles into AI-driven marketing, centred on responsible data use, fair algorithmic design, transparent communication, and emotional sensitivity.

The concept of ethical intelligence in marketing urges organisations to look beyond profit-driven motives and consider the broader implications of their technological choices. It is not enough to be efficient or even innovative—today’s consumers are looking for empathy, fairness, and honesty from the brands they engage with.

This framework encourages a shift in mindset—from reactive compliance to proactive ethical leadership. It invites marketers to work alongside technologists, ethicists, regulators, and consumers to co-create marketing strategies that are as morally grounded as they are technologically advanced. In doing so, brands can truly harness the full potential of AI—enhancing not just customer engagement but also societal well-being.

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AI-Enabled Digital Transformation in Emerging Economies: Opportunities, Challenges, and Pathways to Sustainable Development

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Abstract:

Artificial intelligence (AI) is reshaping how emerging economies approach digital transformation, offering new opportunities for economic growth, improved public services, and social development. However, the uneven distribution of AI capabilities, limited digital infrastructure, and skills gaps create significant barriers to equitable adoption. This paper examines how emerging economies are leveraging AI technologies across sectors such as agriculture, healthcare, finance, and education while addressing persistent challenges including data governance, regulatory frameworks, and workforce development. Through a mixed-methods analysis of case studies from India, Brazil, Kenya, and Vietnam, we identify critical success factors and recommend context-specific policy interventions that balance innovation with inclusion. The findings suggest that AI-driven transformation in emerging economies requires not merely technology transfer but localized capacity building, inclusive governance structures, and strategic partnerships between governments, private sector, and civil society. We conclude that when implemented thoughtfully, AI can accelerate sustainable development goals, but only if emerging economies develop indigenous AI capabilities and ensure benefits reach marginalized communities.

Keywords: Artificial intelligence, Digital transformation, Emerging economies, Inclusive growth, Digital infrastructure, Sustainable development

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Investor Trust in AI Financial Advice

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Abstract: The rapid proliferation of artificial intelligence in financial services has transformed how individual investors receive guidance, shift portfolios, and manage wealth. While robo-advisors and machine-learning algorithms offer data-driven, cost-effective portfolio management, the adoption of automated wealth tools heavily relies on end-user trust. Traditional financial advisory models

depend on interpersonal relationships and human empathy, whereas AI platforms rely on transparency, algorithmic accuracy, and perceived credibility. Understanding the psychological determinants of user trust in automated financial systems is critical, as low trust can lead to algorithmic aversion—where users abandon beneficial models after minor errors—while blind trust exposes investors to systemic vulnerabilities. This research investigates the primary drivers of investor trust in AI-driven financial advice, examining how system transparency, perceived competence, and risk tolerance influence retail investor acceptance.

Methodology: This study adopts a mixed-methods empirical approach, combining quantitative surveys with controlled behavioural experiments involving active retail investors. Data is collected through structured questionnaires administered to a diverse sample of individual investors across varying age brackets, income levels, and financial literacy backgrounds. The survey instrument measures construct such as perceived usefulness, algorithmic transparency, data privacy concerns, and overall trust disposition using established psychometric scales. Additionally, a randomized experiment evaluates participant decision-making when interacting with simulated AI financial advisory interfaces under normal market conditions versus simulated market volatility. Statistical analyses, including structural equation modelling and regression analysis, are utilized to evaluate the direct and moderating impacts of demographic factors and financial literacy on user reliance on automated recommendations.

Result and Discussion: Preliminary evaluations indicate that perceived transparency of the underlying algorithm is the single most influential determinant of user trust. Investors who receive clear, plain-language explanations of how recommendations are generated exhibit significantly higher compliance with portfolio rebalancing suggestions compared to those interacting with "black-box" systems. Furthermore, demographic variables play a moderating role: younger, tech-savvy demographics display higher initial trust in automated advice, whereas older cohorts place greater weight on historical track records and hybrid advisory options. The findings suggest that reducing technical jargon and increasing interface explainability directly mitigates algorithmic aversion, fostering sustained engagement with AI financial tools during periods of market stress.

Conclusion: Investor trust in AI financial advice is not merely a function of technical precision, but a complex psychological outcome shaped by transparency, interpretability, and user education. As automated wealth management tools become mainstream, fintech developers and financial institutions must prioritize explainable AI frameworks that demystify algorithmic decisions. Doing so will bridge the gap between machine capability and human confidence, ultimately encouraging safer, more rational long-term financial planning among retail investors.

Keywords: Artificial Intelligence, Behavioral Finance, Robo-Advisors, Investor Trust, Algorithmic Transparency



Building an AI-Powered E-Grocery Ecosystem in India: Personalisation, Kirana Integration, Regional Inclusion and Sustainable Consumer Behaviour

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Abstract:

India's grocery sector is rapidly adopting mobile applications, digital payments, online marketplaces and data-driven marketing. Artificial intelligence (AI) is increasingly used for recommendations, promotions, demand forecasting and customer engagement. Yet an inclusive e-grocery ecosystem must also address the role of kirana stores, regional diversity, affordability, delivery convenience and environmental sustainability. This study examines how AI-enabled personalisation, trust-building communication, sustainability communication and perceived convenience relate to consumer behaviour in India's online grocery market. An explanatory mixed-method design was used. Survey data were collected from 420 adult online grocery consumers in Delhi, Mumbai, Bengaluru, Chennai and Hyderabad, while 15 shoppers participated in semi-structured interviews. Descriptive analysis, factor analysis, regression, mediation, moderation and structural equation modelling were applied. The findings indicate that personalisation is positively associated with purchase frequency, while trust-building communication is strongly associated with platform loyalty. Sustainability communication relates more strongly to pro-environmental intention than to actual purchasing behaviour. Interviews show that consumers value transparent information, credible recommendations and sustainable options that do not increase cost or inconvenience. These findings reveal an attitude-behaviour gap: environmental concern often weakens when sustainable products are less affordable, less available or harder to obtain. The study proposes an ecosystem that combines AI with kirana participation, regional supply networks and responsible fulfilment. Such a model could improve convenience without displacing the local knowledge and accessibility of neighbourhood retailers.

Keywords: Artificial intelligence; e-grocery; kirana stores; digital marketing; consumer behaviour; personalisation; sustainability; regional inclusion; platform trust; India.



The Role of Artificial Intelligence in Accelerating Digital Capability and Workforce Agility

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Background: The growing use of artificial intelligence (AI) is changing how organizations manage people, skills and workplace processes. As businesses respond to rapid technological and market changes, traditional human resource practices are increasingly being supplemented by data-driven systems that can identify skill requirements, support employee development and improve workforce planning. However, limited empirical research has examined how AI-enabled HR systems can simultaneously strengthen digital capability and workforce agility. This study therefore examines the role of AI in supporting faster skill development and more responsive workforce management.

Methodology: A descriptive survey design was adopted using both quantitative and qualitative information. Data were collected through questionnaires and semi-structured interviews from organizations operating primarily in technology and service-related sectors. Forty-five companies were included in the study. Four areas of AI-supported HR practice were examined: algorithmic systems, intelligent analytics, virtual coaching and automated talent-matching processes. The analysis focused on their contribution to skills acquisition, workforce planning and organizational agility.

Results and Discussion: The findings indicate that AI-supported HR practices can improve the speed and efficiency of workforce-related decisions. The reported use of intelligent analytics for identifying potential skill shortages was associated with a 34% reduction in the time required to fill vacant positions. AI-supported forecasting processes were also reported to achieve 88% accuracy, compared with conventional manual forecasting approaches. These findings suggest that AI can help organizations identify emerging workforce requirements earlier and align available skills more effectively with changing business needs.

Conclusion: AI has the potential to strengthen Strategic Human Resource Management by connecting workforce planning with changing organizational requirements. Its value extends beyond administrative automation to areas such as skills identification, employee development, recruitment and workforce forecasting. Organizations seeking greater agility should therefore consider AI as part of a broader HR transformation strategy rather than as a stand-alone technological investment. At the same time, issues of transparency, employee privacy, fairness and human oversight need to remain central to implementation. Future research should examine these ethical dimensions and investigate how AI-enabled HR practices influence workforce agility over longer periods and across different industries.

Keywords: Strategic Human Resource Management; Artificial Intelligence; Digital Capability; Workforce Agility; Predictive Analytics; Skills Development; Talent Management.



AI For Business Strategy: Decision Making and Competitive Advantage

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Background: Artificial Intelligence (AI) has arisen as an important and vital source of technology that is either directly or indirectly influencing the manner in which the modern organisations and corporates plan, manage, and compete within the business environment. With the simultaneous growth of digital data and dynamic advanced technologies, businesses are increasingly using AI tools and applications to understand market reactions and its trends, analyse and interpret customer behaviour, improve business processes, and support managerial decisions. Traditional methods or ways of making decisions often depends on experiences one has during his interactions in activities relevant to it with restricted information. AI can provide data-based details with deep insights and help managers recognize patterns and show possible future outcomes that are more likely to occur. In highly competitive markets, the ability to make timely and accurate decisions can considerably influence the performance of an organization. Therefore, the deliberate and considerable use of AI has become increasingly useful for organisations wanting to improve accuracy, efficiency, encourage innovation, respond to dynamic expectations of customers, and develop a required and sustainable competitive advantage. However, the successful, ethical and effective use of AI also depends on factors such as relevancy and quality of data, skills of the employee engaged in actual working, ethical practices, and actual combination with human judgement.

Methodology: This paper monitors a conceptual, theoretical and descriptive approach based on a review of already existing literature, research studies, business reports, and other relevant secondary sources related to AI and natural business strategy. The study describes on understanding and deeply analysing how AI-based technologies influence managerial decision-making, performance of businesses, innovation, and other competitive positioning in the market.

Results and Discussion: The study depicts that AI can improve the quality and duration in taking good business decisions by providing an insightful idea based on data and identifying patterns that may not be easily accepted through traditional methods as used earlier. Its strategic use can support forecasting of demand, customer analysis, management of risk, cost-reduction, process automation, and personalised services. AI can also foster and boost innovation and help organisations and other institutions too to respond more effectively towards changes in customer demands and market conditions. However, challenges such as privacy of data, poor-quality data, high implementation costs, lack of skilled employees and workers, moral and ethical concerns, and resistance to technological change may limit its benefits. The results and related findings suggest that AI creates its value at a greater level when it is integrated or combined together with human intelligence, their judgement, decision-making, day-to-day managerial experience, and clear organisational visions and goals.

Conclusion: AI has the potential to become the most powerful strategic resource for organisations seeking better and quick decision-making and sustainable competitive advantage. However, successful AI adoption requires more than simply introducing and initiating for new technological tools and applications. Organisations require correct techniques, strategies, skilled employees for effective usage of AI, reliable and relevant data, ethical and effective moral practices and supervision. The study concludes that organizations that successfully trust AI capabilities with human intelligence and does excellent visionary tactical planning can improve effectiveness, efficiency, modernisation, satisfaction of customers, and their ability to compete and perform at their best in a dynamic environment affecting business.

Keywords: Artificial Intelligence, Strategic and Visionary Goals, Excellent Decision-Making, Competitive Advantage, Innovation



AI Adoption and Financial Sustainability of Indian Startups: The Role of Operational Efficiency

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Abstract:

Artificial Intelligence (AI) is gradually taking its place in the day-to-day functioning of startups, where it is being used for activities such as financial analysis, customer support, marketing, demand forecasting, risk assessment and process automation. At initial stage working in businesses with limited financial and human resources, these applications can help in saving time, improve the use of available resources and support fast business decisions. However, the presence of AI in a startup does not by itself guarantee improved financial performance. The real benefits will depend on how effectively the technology is integrated into everyday business activities. Just adopting new technology is not enough. Organizations must ensure that employees are properly trained and that the technology is being used in ways that support their daily work. Therefore, the success of technology adoption depends on proper planning, employee readiness. The present study examines the relationship between AI adoption and the financial sustainability of Indian startups, with operational efficiency considered as an important intervening factor. The startups using AI across different business functions are better able to manage resources, processes, control inefficiencies and support managerial decision-making, and these operational improvements are reflected in their ability to maintain financially stable operations over time. The study considers AI applications in areas such as financial and business analysis, customer relationship management, marketing, forecasting, risk management, process automation and decision support. Operational efficiency is measured by how well a business uses its resources and manages internal business processes.

Financial sustainability is assessed by startup's financial strength, stability, and its ability to continue operating successfully in the long run. Sector-wise differences are to be examined, since the relevance and practical value of AI may vary according to the nature of the business. Different industries have different operational needs, customer expectations, and levels of digital readiness, which can influence how AI is adopted and used. An empirical framework is to examine the links among AI adoption, operational efficiency and financial sustainability. Measures for AI adoption and operational efficiency will be selected according to the availability and reliability of relevant data, while suitable financial indicators will be used to assess sustainability. Rather than treating AI adoption as an automatic source of financial improvement, the study focuses on the underlying question of whether better operational performance enables startups to derive greater financial value from AI. The study is expected to add to the emerging literature on technology adoption in Indian startups by bringing technological adoption, operational performance and financial sustainability into a common framework. Its findings may also help startup founders and managers understand where AI can provide practical value and how technology-related investments can be aligned with efficient resource management and long-term financial stability.

Keywords: AI Adoption, Operational Efficiency, Indian Startups, Financial Performance, Financial Sustainability.



The Impact of Artificial Intelligence on Accounting Education: A Review of Opportunities, Challenges, and Curriculum Implications

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Abstract:

Artificial intelligence (AI) is rapidly becoming part of both professional accounting practice and accounting education. Recent advancements in generative AI have expanded its scope to include analysis, content creation, problem solving, and decision support, whereas earlier applications focused primarily on tasks like optical character recognition, data processing, and process automation. These changes are creating new opportunities for accounting educators while also bringing new challenges related to keeping the curriculum relevant, ensuring fair assessment, maintaining academic integrity, and developing students' professional skills.

This paper reviews current research on the application and implications of AI in accounting education, paying special emphasis to potential, challenges, and curriculum development.

According to the literature, automation is likely to increase the value of abilities related to data analysis, interpretation, professional judgment, and technology-enabled decision-making while decreasing the necessity of some regular accounting tasks. Emerging evidence also suggests that appropriately guided use of AI and machine-learning tools can support student learning by allowing learners to explore accounting problems and focus more strongly on interpretation rather than mechanical procedures. However, there is still little empirical data regarding AI's long-term effects on education. Institutions and instructors have additional hurdles because to concerns about inaccurate AI outputs, academic integrity, student overdependence, and the quick speed of technology change.

As a result, the study takes into account curriculum development from two angles: what should be taught to students and how accounting knowledge should be evaluated. Instead of treating AI as a distinct technical discipline, it makes the case for integrating AI and data analytics across accounting courses. Greater emphasis should be placed on critical thinking, professional judgement, ethical reasoning, analytical ability and effective human–AI collaboration. The paper concludes that accounting education needs to evolve alongside the profession while avoiding curriculum changes based solely on technological enthusiasm. Evidence-based curriculum reform, faculty development and carefully designed assessment practices are essential for preparing future accounting professionals for an increasingly AI-enabled workplace.

Keywords: Artificial intelligence; accounting education; accountancy education; generative AI; data analytics; professional competence; accounting curriculum; human–AI collaboration.



Role of World Bank Projects in Building an AI-Powered India

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Abstract: “Building an AI-Powered India,” the role of World Bank projects can be presented very simply: the World Bank does not have to fund “AI” alone; it can use its existing projects in skills, agriculture, education, health, digital infrastructure, MSMEs and governance as the foundation for India, AI economy. The World Bank can play an important role in helping India build an AI-powered economy. In my view, its biggest contribution should be to connect AI with existing development projects rather than treating AI as a separate technology project. The World Bank and new India Country Partnership Framework for 2026–31 is already focused on jobs, skills, rural development, urban transformation, human capital, infrastructure, innovation and private-sector investment. These areas provide a strong foundation for AI-led development.

AI and Government: World Bank-supported digital governance projects can be expanded with AI. AI could help governments (a) process applications faster (b) analyse citizen complaint (c) monitor development schemes (e) translate documents (f) improve public-service delivery. The aim should be to make government faster, simpler and more citizen-friendly.

AI and Skills: The World Bank is already supporting India's skills development through an \$830 million program to upgrade Industrial Training Institutes (ITIs) and improve job-ready skills. This creates an opportunity to add AI-related skills such as: AI literacy, data skills robotic, digital manufacturing AI-assisted work. In my view, preparing India's young people for AI is as important as building AI infrastructure.

AI and Agriculture: World Bank agricultural projects can become platforms for AI-based farming. A recent World Bank-supported Maharashtra agriculture project uses digital technology, remote sensing, data integration and AI in agricultural value chains. AI can help farmers with, crop disease detection weather information, irrigation, soil management, crop productivity, access to markets. This is especially important because AI should reach small and marginal farmers, not only large companies.

AI and Education: World Bank-supported education projects can use AI for: personalized learning, teacher support, learning assessment, Indian-language educational content, identifying students who need additional support. The World Bank is already supporting digital solutions to improve learning outcomes in Indian state

AI and Healthcare: Digital-health projects can provide the foundation for AI applications in healthcare. For example, the current Kerala Health Systems Improvement Program supports digital health systems, integrated data platforms and cyber security. These systems could eventually support AI-based: diagnostic assistance, health-data analysis, disease monitoring, patient support.

AI and MSMEs: The World Bank's focus on MSMEs and private-sector-led job creation can be connected with AI adoption. World Bank projects could help small businesses access affordable AI for: accounting, marketing, inventory, customer service, exports, manufacturing. The objective should be higher productivity and more jobs, not simply greater technology adoption.

AI Infrastructure and Innovation: World Bank financing can help India develop the foundations needed for AI:

Computing + Digital connectivity + Data + Skills + Research

The World Bank's 2026 AI report emphasizes that developing countries do not need to build the world's largest AI models immediately. They can first adopt useful AI, adapt it to local languages and needs, and gradually build their own capabilities. This approach fits India very well.

AI for Inclusive Development: World Bank projects can help ensure that AI benefits: Rural communities, women, farmers, MSMEs, students, workers, non-English speakers. The World Bank has also highlighted the potential of low-cost “small AI” that can work through voice, basic phones

and other accessible technologies. This is important for India because an AI-powered economy should not benefit only large cities and technology companies.

Overall, Role of the World Bank: The World Bank's role in five simple ways:

- Finance – provide development financing for AI-related infrastructure and projects.
- Knowledge – bring international experience and best practices.
- Skills – support AI-ready education and workforce development.
- Innovation – connect universities, start-ups, government and private companies.
- Inclusion – make sure AI reaches rural areas, small businesses and ordinary citizens.

The World Bank's current India partnership plans around US\$8–10 billion in annual World Bank Group financing and aims to mobilize additional private capital. This makes it possible to use World Bank resources not only for direct investment but also to attract much larger private investment into India's technology and development ecosystem.

Conclusion:

In my view, the World Bank's greatest role should be to help India connect its existing development projects with AI. Instead of creating completely separate AI programs, India can gradually add AI to:

Education → Healthcare → Agriculture → Government → MSMEs → Skills → Research → Infrastructure.

This can turn AI from a technology-sector initiative into a national development strategy.

The ultimate goal should be simple:

“Use World Bank-supported development projects to make AI useful, affordable and accessible for India's people.”

This approach can support India's vision of Viksit Bharat 2047 while ensuring that the benefits of AI reach not only technology companies, but also farmers, students, workers, entrepreneurs and ordinary citizens.

Key Words: Artificial Intelligence (AI), World Bank Projects, Digital Transformation, AI-Powered India, Skill Development, Agricultural Technology, Digital Governance, MSME Development, Inclusive Development, Viksit Bharat 2047



Moving From Cash to Cashless Economy

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Abstract:

The present period is witnessing substantial changes in the methods used to send and receive money due to technological development and changes in financial policy. There are now more ways to make payments than ever before, including digital and electronic modes. A cashless economy represents a transition in which individuals, businesses and institutions increasingly rely on electronic payment systems while reducing their dependence on physical currency. The growth of plastic money and digital payments, particularly after demonetization, contributed to wider awareness and use of cashless transactions in India. The purpose of this study is to examine the major modes of cashless transactions, understand their benefits and challenges, and analyse their role in economic growth. The study is descriptive in nature and is based on secondary data, including literature, journals, articles and relevant published material. The study indicates that convenience, offers, rebates and ease of transactions influence people to adopt cashless payment methods, while working professionals and business people show preference for digital payment options. At the same time, concerns relating to trust, security, digital infrastructure and awareness continue to affect wider adoption. India therefore has considerable scope for further development of a cashless economy, supported by reliable infrastructure, digital literacy, secure payment systems and coordinated efforts by government, businesses and citizens.

Keywords: Cashless Economy, Technological Development, Demonetization, Digital Payment Methods, Economic Transactions

Introduction: The concept of a cashless economy represents a significant transformation in the way financial transactions are conducted. It signifies increasing reliance on digital and electronic payment methods while reducing dependence on physical currency such as coins and paper money. In a cashless economy, individuals, businesses and governments use various forms of electronic payments to conduct transactions, including credit and debit cards, mobile wallets and online banking systems.

The shift towards a cashless economy has been accelerated by advancements in technology, wider availability of the internet and growing acceptance of digital payment solutions by consumers and businesses. It has transformed the way money is handled and has implications for financial inclusion, security, convenience and economic efficiency.

The primary drivers behind cashless transactions include the convenience and speed of digital payments, improved security mechanisms, reduced reliance on physical currency and the possibility of greater transparency. Governments and financial institutions have consequently promoted policies and innovations encouraging digital transactions.

A cashless economy offers opportunities as well as challenges. While digital payments can simplify transactions and record keeping, users may face problems related to security, privacy, lack of awareness, technical failures and unequal access to digital infrastructure.

Historical Background of Digital Payments in India: The historical development of digital payments in India can be understood as a gradual movement from traditional cash-based transactions towards electronic and mobile-based payment systems. Pre-Independence Era: Before independence in 1947, India primarily relied on cash transactions and traditional arrangements such as barter and hundis. Coins and banknotes were the major instruments of monetary transactions.

- 1950s–1970s: After independence, the Reserve Bank of India played an important role in regulating and modernising the financial system. Efforts were made to standardise and strengthen the currency and banking system.
- 1980s–1990s: Electronic fund-transfer systems began to develop, while economic liberalisation and expansion of the information technology sector created favourable conditions for electronic banking.
- 2000s: The introduction of NEFT and the growing use of mobile phones and the internet accelerated electronic inter-bank transfers and mobile and online banking.
- 2008 onwards: The establishment of the National Payments Corporation of India (NPCI) supported the development of retail payment and settlement systems, including IMPS and subsequently UPI.
- 2010s: Digital payments expanded alongside financial-inclusion initiatives such as Pradhan Mantri Jan-Dhan Yojana.

Objectives of the Study:

- To identify the major modes of cashless transactions.
- To examine the benefits and challenges of a cashless economy.
- To study the impact of a cashless economy on economic growth.
- To understand the factors influencing people to shift from cash to cashless payment modes.
- To examine the role of digital infrastructure and awareness in promoting cashless transactions.

Research Methodology: The study is descriptive in nature. The researcher has used secondary data for the purpose of the study. Secondary sources include review of literature, journals, articles and other relevant published material relating to cashless transactions and digital payments. The study focuses on understanding the development, benefits, challenges and broader economic implications of cashless transactions.

Digital Payment Methods in India:

- *Unified Payments Interface (UPI):* UPI is a real-time payment system that enables instant inter-bank transactions through mobile devices. It allows users to link bank accounts to mobile applications and make payments, transfer funds and pay bills.

- *Mobile Wallets*: Mobile or electronic wallets allow users to store money digitally and use it for recharges, bill payments, shopping and transfers.
- *Debit and Credit Cards*: Cards issued by banks and financial institutions provide a convenient method of payment at point-of sale terminals and online merchants.
- *Net Banking*: Internet banking enables users to access bank accounts online and undertake activities such as fund transfers, bill payments and account management.
- *Aadhaar-enabled Payment System (AePS)*: AePS uses Aadhaar authentication and biometric verification to facilitate basic banking transactions and can be useful in rural and underserved areas.
- *National Electronic Funds Transfer (NEFT)*: NEFT facilitates electronic inter-bank fund transfers and is commonly used for transferring money between bank accounts.
- *Immediate Payment Service (IMPS)*: IMPS provides an instant electronic inter-bank fund-transfer facility through mobile and online banking platforms.
- *UPI QR Code Payments*: QR-based UPI payments enable customers to scan a merchant's QR code and initiate a payment directly from a linked bank account.

Impact of Cashless Economy on Economic Growth

- *Increased Efficiency*: Cashless transactions can be faster and more efficient than physical cash transactions and can reduce the time and resources involved in handling cash.
- *Financial Inclusion*: Digital payment systems can improve access to formal financial services for underserved populations and support saving, investment and credit-related activities.
- *Reduction in Informal Economy*: Digital transactions create transaction records, which can improve transparency and make some forms of unreported activity more difficult.
- *Monetary Policy*: Greater digitisation of financial transactions can provide financial institutions with more information about economic activity and support financial management.
- *E-commerce and Business Growth*: Electronic payment facilities support online commerce and enable businesses to serve customers beyond their immediate physical locations.
- *Consumer Spending*: Easy access to electronic payment instruments can facilitate purchases and contribute to transaction activity.

Benefits of Cashless Transactions:

- *Convenience*: Cashless transactions reduce the need to carry physical currency and can make payments easier and quicker.
- *Security*: Electronic payments can provide security features such as PINs, biometric authentication and encryption.
- *Efficiency*: Digital transactions can be completed quickly, particularly for businesses handling large numbers of transactions.

- *Record Keeping:* Electronic transactions generate digital records that assist in budgeting, expense tracking and financial reporting.
- *Financial Inclusion:* Mobile banking and digital payment services can extend financial services to remote or underserved areas.
- *Reduced Theft and Counterfeiting:* Reduced dependence on physical cash can lower exposure to physical theft and counterfeit currency.
- *Cost Savings:* Businesses can reduce some costs associated with cash handling, transportation and security.
- *Global Commerce:* Electronic payments facilitate online and cross-border transactions.
- *Contactless Payments:* Contactless card and smartphone payments can reduce physical contact and speed up transactions.
- *Environmental Benefits:* Reduced dependence on physical currency may reduce some requirements associated with currency production and transportation.
- *Government Benefits:* Digital transaction records can support auditing and may assist efforts to address tax evasion and money laundering.

Security Challenges:

- **Data Breaches:** Unauthorised access to customer information can result in identity theft, financial fraud and other losses. Businesses need appropriate security measures and regular security reviews.
- **Phishing and Social Engineering:** Users may be deceived into revealing passwords, credentials or payment information through fraudulent communications. Awareness and verification are important safeguards.
- **Card Skimming:** Skimming involves unauthorised capture of card information through compromised ATMs or point-of-sale devices. Users should monitor transactions and exercise caution.
- **Mobile Wallet Vulnerabilities:** Mobile applications can be exposed to malware or unauthorised access when devices and applications are not properly secured or updated.

Government Initiatives Regarding Digitalisation:

- **Digital India:** The Digital India initiative, launched in 2015, aimed to transform India into a digitally empowered society 4 access to bank accounts and formal financial services.
- **Cashless Villages:** Government efforts have included promotion of digital transactions in selected villages to encourage reduced dependence on physical currency.

Factors Influencing the Shift from Cash to Cashless: The transition from cash to cashless payment modes is influenced by several factors. Convenience is important because digital payments can be completed quickly without requiring physical currency. Offers, rebates and promotional benefits can encourage consumers to try digital payment methods. The growing availability of

smartphones, internet services and banking applications has further expanded access to digital transactions.

At the same time, trust and confidence remain important. Some users continue to feel uncomfortable sharing financial or personal information online. Technical problems, cybersecurity concerns, lack of awareness and inadequate infrastructure can discourage adoption. Thus, the movement from cash to cashless is influenced by both positive incentives and perceived risks.

Findings of the Study

- Cashless payment methods have expanded the available options for making and receiving payments.
- Digital payment methods provide convenience, speed and electronic records of transactions.
- Working professionals and business people show preference for digital payment options according to the study material.
- Convenience, offers and rebates can influence consumers to shift towards cashless payment modes.
- Digital transactions have potential implications for financial inclusion and economic efficiency.
- Security and privacy concerns continue to affect people's confidence in digital payments.
- Some people still do not use digital payment methods.
- Digital infrastructure and public awareness require continued development.
- Users may face technical and security-related problems while making digital payments.
- There remains substantial scope for further development of a cashless society.

Key Suggestions:

- People should be educated about the benefits, procedures and risks associated with cashless payments.
- Digital-payment awareness programmes should be strengthened before implementing major changes affecting payment behaviour.
- Government and financial institutions should work towards reliable and secure digital infrastructure.
- Users should be encouraged to develop basic digital and financial-security awareness.
- Strong cybersecurity practices should be promoted among payment providers, businesses and consumers.
- Infrastructure should be developed in advance to support large-scale changes in payment systems.
- People, businesses and government should work together to strengthen digital payment ecosystems.

Conclusion: The transition from cash to cashless transactions represents an important change in India's payment ecosystem. Digital payment methods have created greater convenience and new opportunities for individuals, businesses and institutions. They can support efficient transactions, digital record keeping, financial inclusion, e-commerce and broader economic activity.

However, the transition to a cashless economy is not without challenges. Lack of awareness, concerns about security and privacy, technical problems and gaps in infrastructure can reduce people's willingness to use digital payment methods. The study therefore indicates that the development of a cashless economy requires not only technological advancement but also trust, awareness, security and reliable infrastructure.

India has considerable scope for further digitalisation of economic transactions. A coordinated effort by government, financial institutions, businesses and citizens can help create an environment in which cashless payment methods are accessible, secure and convenient. The movement from cash to cashless should therefore be supported through appropriate infrastructure, digital literacy and responsible use of technology.

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Balancing AI Adoption and Data Privacy: A Critical Management Challenge in Modern Business

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Abstract:

Artificial Intelligence (AI) is becoming more and more involved in everyday business activities. Businesses are employing AI to aid in decision-making, to automate various processes, to understand customer behavior, to improve their services, and to come up with new methods of creating value. At the same time, the effective use of a number of AI applications relies on having large quantities of data, much of which involves personal, behavioral, financial, and other sensitive information. Although better access to data enhances the abilities of AI systems, it also raises issues relating to privacy, security, consent, transparency, and the responsible use of information. It has therefore become a difficult question for organizations: how can they take advantage of AI without compromising the privacy of the people whose data is what enables these systems to function? Because of this, the issue has gone well beyond the field of technology and is now a major concern for business managers and decision-makers. This study looks at the growing relationship between the adoption of AI and data privacy and considers why maintaining a balance between innovation and the responsible use of data has become a key management challenge.

The study uses a qualitative, exploratory secondary research approach, reviewing peerreviewed articles, academic publications, industry reports, institutional documents, and policy papers related to AI adoption and data privacy. The literature is analyzed thematically to identify recurring issues, practices, and perspectives. No primary data, surveys, interviews, or questionnaires are used. The approach integrates insights from diverse sources to develop a broader management perspective on balancing AI adoption with data privacy.

The literature highlights key challenges including data misuse, cyber security, lack of transparency, unclear consent, algorithmic bias, accountability, and changing regulations. At the same time, businesses need reliable data for effective AI adoption. Practices such as privacy-by-design, strong data governance, explainable AI, access controls, privacy enhancing technologies, auditing, and continuous monitoring can help address these concerns. However, consistent implementation remains difficult due to organizational and regulatory differences. Effective AI governance therefore requires coordination among managerial, technological, legal, and compliance functions.

The study states that AI adoption and data privacy should not be seen as two priorities which organizations have to deal with separately. Rather, privacy issues should be included in AI related decisions right from the start. By having effective data governance, ensuring transparency, promoting accountability, being aware of the regulatory environment, and using AI in a responsible manner, organizations will be able to advance technological innovation while at the same time

protecting the interests of their stakeholders and keeping trust. The study adds to the current debate by combining the technological, ethical, regulatory, and managerial aspects of the relationship between AI and privacy; it stresses that responsible management of data can provide an important basis for sustainable and trustworthy AI adoption in today's business environment.

Keywords: Artificial Intelligence; AI Adoption; Data Privacy; Data Governance; Responsible AI



Predictive Analysis with the Help of Artificial Intelligence in the Context of Business Decision-Making

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Abstract:

In the present competitive business environment, companies produce and manage a large volume of information each day. Information such as sales records, customer preferences, market trends, inventory data and financial details can offer useful insights, but the real difficulty lies in using this information to anticipate what might happen in the future. The application of predictive analysis through Artificial Intelligence (AI) gives businesses the chance to go beyond simply reviewing their past performance and to make better-informed decisions regarding future scenarios. AI is capable of detecting patterns in large datasets, identifying changes in customer behaviour and offering predictions which can aid managers in planning and making decisions. As the use of AI continues to increase, it is opening up new opportunities for businesses to enhance their forecasting, reduce uncertainty and react more efficiently to changing market conditions. This study adopts a conceptual and descriptive method in order to investigate the role of Artificial Intelligence in predictive business analysis. The study is concerned with examining how AI-based predictive methods can be applied in various areas of business management.

The paper looks at applications including sales forecasting, prediction of customer behaviour, demand forecasting, inventory management, identification of financial risk, marketing analysis and business planning. It also looks at the main factors that affect the usefulness of AI-based predictions, such as the availability of reliable data, the use of suitable analytical techniques, the technological infrastructure and the level of managerial understanding. The aim of the study is to give a general understanding of the practical role of predictive AI in supporting business decisions. The study shows that predictive analysis can greatly alter the way in which businesses make decisions. Rather than relying completely on past experience or assumptions, managers can use the patterns found in business data to gain a clearer view of what the future might hold. AI-based predictive systems can help businesses to estimate future sales, understand customer needs, plan

their inventory levels and detect potential risks at an early stage. This in turn enables businesses to make more effective use of their resources and to respond to market changes in a timely fashion. At the same time, the value of AI predictions is dependent on the quality of the information supplied to the system. If the data is incomplete or inaccurate, the predictions will be unreliable. Other issues include data privacy, the lack of transparency in some AI models, the cost of implementation and the risk of becoming too dependent on automated recommendations. Hence, human judgement is still important when interpreting the predictions generated by AI and when applying them to actual business situations.

The study concludes that predictive analysis based on Artificial Intelligence has great potential in supporting contemporary business decision-making. By transforming the available business data into meaningful forward-looking insights, AI can assist organisations in improving their forecasting, planning and risk management. However, in order to achieve successful implementation, it is necessary to have reliable data, appropriate technology and a responsible use of AI. Companies ought to regard predictive AI as a tool to aid in decision-making rather than as a full substitute for managerial experience and judgement. By combining AI-generated insights with human decision-making, a balanced approach can enable organisations to respond more effectively to uncertainty and to changing business conditions.

Keywords: Artificial Intelligence, Predictive Analysis, Business Analytics, Machine Learning, Decision-Making



Impact of Generative Ai on Higher Education: Opportunities, Challenges, and Responsible Use

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Abstract:

The emerging technologies of generative AI (GenAI) are changing higher education through assisting students in learning, teachers in teaching, and researchers in their work. However, the risks of plagiarism, academic dishonesty, fake news, and data privacy breaches are of particular concern. To mitigate the ethical issues associated with the usage of GenAI in higher education institutions, the administration needs to control this new technology and establish guidelines in accordance with its responsible use.

This paper provides a conceptual discussion of the role of GenAI in higher education based on an analysis of scholarly articles, research reports, journals, and other sources related to the topic of artificial intelligence and education. Particular attention is paid to the main opportunities and

challenges associated with the application of GenAI by students, instructors, researchers, and educational institutions in general. The focus of this paper is on academic integrity, plagiarism, ethical concerns, privacy, human interactions, and other issues related to the use of artificial intelligence in education.

This paper aims to prove that generative artificial intelligence can genuinely benefit higher education, mainly students, teachers, and researchers. Students can use generative artificial intelligence to locate information, develop ideas, improve their writing, and an explanation of the most confusing points. For instance, the educators may use such instruments to define the learning outcomes, design the study plans, quizzes, presentation slides, and other modules of teaching. Meanwhile, the researchers, in their turn, may employ GenAI to sort out lengthy texts, analyze the data, and edit their results prior to submitting the final version of the work..

However, the use of these GenAI tools in education has its controversy and challenges, especially in terms of safety, security, and integrity. Such technology may present irrelevant, inaccurate, or even fake information and invent scholarly references. In addition, there is a danger of GenAI abuse in coursework and assignments without the faculty's permission, which may result in a breach of intellectual property and plagiarism. The issues of data privacy and intellectual property should be taken into account while using such technology in education. Therefore, educational institutions must develop rules and regulations related to the GenAI use in the academic community.

GenAI can generate many opportunities for students, instructors, and researchers in higher education. Nonetheless, to gain the advantages of this technology, its ethical and legal implications should be considered by the users. On the one hand, those who use GenAI should check the correctness of the information, validity of the references, and avoid adverse impacts on their studies or work. By contrast, educational institutions should set specific rules to establish the primary limitations, obligations, and norms related to GenAI application. Thus, users can minimize the possible risks and successfully benefit from this technology.

Keywords: Generative Artificial Intelligence, Higher Education; Academic Integrity, AI Ethics, Responsible AI Use, Artificial Intelligence in Education



An AI-Enabled Learning Management System for Personalized Higher Education

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Abstract:

Artificial Intelligence (AI) is slowly turning into a tool in education. Artificial Intelligence (AI) can assist students in finding information locating good learning resources and getting simple academic help whenever they need it. Learning Management Systems (LMS) are already in use, at schools and colleges to handle courses, attendance, exams, results, study materials and student data. Most Learning Management Systems (LMS) only give information and do not connect with students based on their personal needs.

Learning Management Systems are widely used in education for managing courses learning materials, attendance, examinations and communication. However conventional Learning Management Systems often provide personalization and intelligent interaction. Students may have learning requirements and may need immediate assistance with academic or institutional queries. Artificial Intelligence can enhance a Learning Management System by understanding natural-language questions providing automated assistance and supporting learning. This paper proposes an AI-enabled Learning Management System framework designed to combine management, with intelligent student support.

The proposed LMS is made of two parts: a regular LMS part and an AI part. The LMS part keeps track of student details, courses, attendance, tests, grades, study materials, feedback and alerts. The AI part gives chat help, understanding of natural language questions study tips and custom suggestions. Students can talk to the system with language rather than moving through many sections for everyday questions.

The proposed system follows a modular architecture. Student and academic information is maintained in a centralized database. The application layer manages authentication and LMS operations, while the AI layer processes student queries and identifies relevant information or intents. A recommendation component can use academic information and student interactions to suggest relevant learning resources. Human supervision is retained for important academic decisions. The framework can be implemented using web technologies such as Laravel, MySQL, and an NLP-based chatbot framework. The proposed system can provide faster access to routine academic information, improve student interaction with the LMS, and support personalized learning. It can also contribute to educational resilience by providing continuous digital access to resources and basic assistance. For faculty and administrators, centralized information and analytic can support better monitoring of student needs.

AI-powered educational tools face challenges that must be carefully managed. These include protecting student privacy ensuring data security avoiding bias in algorithms preventing responses making AI systems transparent and promoting responsible use of student information. It is important to remember that AI should help teachers not replace them. Students and educators must have control, over academic data. This control should come through authentication and authorization processes. Every effort should be made to keep data safe and fair for all users.

An AI-enabled LMS can make learning platforms by adding smart tools that help students and manage courses at the same time. The framework we suggest gives a way to bring AI into higher education. It keeps teachers and staff in the loop. Treats student data with care. Next steps could include building a working version of the system. Then we can test how easy it is to use how well it answers questions, how personalized it. How much it helps students stay involved, in their learning.

Keywords: Artificial Intelligence, Learning Management System, Personalized Learning, Higher Education, AI Chat bot, Natural Language Processing



AI-based Detection of Cyber Bullying, Abusive and Adult Content or Language on Digital Platforms

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Abstract:

Digital platforms have become an important part of our everyday life. People use social media, messaging apps, online games, and websites to communicate and share their ideas. However, these platforms have also become a source of spread of cyberbullying, abusive language, and adult or inappropriate content. Cyberbullying means repeatedly using internet to insult, threaten, embarrass, or hurt another person. Abusive language includes offensive, hateful or threatening words. Adult content includes materials that is not suitable for children or general audiences. Millions of messages, comments on posts, pictures, and videos are uploaded to digital platforms every day which is almost impossible for a human moderator to check everything manually. Cyberbullying is not always easy to identify.

People use slangs, emoji, changed spellings or indirect words to hide harmful meaning. Normal looking sentence can become offensive based on situation in which it is used. Such content is not detected on time, leading to negative effect on users and make online platforms unsafe.

An AI-based detection system can examine online content and identify content that may be harmful or inappropriate. It can check text for abusive or threatening language and examine images or other

content. System can classify content into categories: safe, abusive, cyberbullying, adult, or uncertain. Platform can show a warning, restrict content from being uploaded, or send to human moderator for cross verifying. Mainly it will not replace human moderators but support them as Strength with largest advantage of its speed which can verify large amount of content much faster than humans. Additionally, provide continuous monitoring.

Although, each and everything with some pros comes along with a package of cons. AI- based detection also has some limitations as: it may misunderstand some jokes, sarcasm, slangs, or actual meaning of conversation. Different languages and regional expressions can make detection difficult, where safe content may be marked as harmful or actual harmful content is missed. Privacy- another important concern because platform need to handle users' personal content carefully. Overall, AI and human judgement should work together to ensure proper privacy protection and responsible use, AI can help make digital platform safer for everyone.

Keywords: Cyberbullying, Abusive Language, digital platforms



Artificial Intelligence for Smart and Resilient Societies Ai-Driven Smart Disaster Management: Enhancing Early Warning and Community Resilience

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Abstract:

Natural disasters such as floods, cyclones, earthquakes, landslides, and extreme weather events pose significant challenges to communities, infrastructure, and public safety. Conventional disaster management systems often face limitations in providing timely warnings, processing large volumes of information, and identifying vulnerable areas. Artificial Intelligence (AI) offers significant opportunities to improve disaster preparedness and response by analysing real-time and historical data, identifying patterns, and supporting faster decision-making. This study explores the potential of AI-driven smart disaster management systems for developing safer, more responsive, and resilient communities.

The study adopts a conceptual and analytical approach to examine the role of AI in disaster management. It reviews the application of machine learning, predictive analytics, natural language processing, remote sensing, and intelligent monitoring systems in different stages of disaster management. The proposed framework integrates data from sources such as weather information, satellite imagery, geographical data, and emergency reports. AI-based analysis can be used to

identify risk patterns, predict possible disaster events, classify vulnerable regions, and generate early warnings. The study also considers the importance of human decision-making, reliable data, accessibility, and responsible use of AI in emergency situations.

The analysis indicates that AI can strengthen disaster preparedness by enabling faster data processing, risk assessment, early warning, and resource prioritisation. Predictive models can assist authorities in identifying high-risk areas and allocating emergency resources more effectively. AI-supported communication systems can also help disseminate alerts and relevant information to communities in a timely manner. However, the effectiveness of AI-based disaster management depends on the availability and quality of data, reliable digital infrastructure, model accuracy, and coordination between technological systems and emergency authorities. Ethical considerations, transparency, privacy, and the digital divide must also be addressed to ensure that AI benefits vulnerable communities rather than increasing existing inequalities.

AI-driven disaster management has the potential to transform conventional approaches into proactive and intelligent systems that support early action and community resilience. Rather than replacing human decision-makers, AI should function as a decision-support technology that combines computational intelligence with local knowledge and institutional expertise. A responsible and inclusive AI framework can contribute to smarter disaster preparedness, faster emergency response, efficient resource management, and more resilient societies. Future research should focus on developing affordable, explainable, and locally adaptable AI solutions that can be effectively implemented in disaster-prone communities.

Keywords: Artificial Intelligence, Disaster Management, Early Warning Systems, Predictive Analytics, Community Resilience



Fake News Detection System for Reliable and Responsible Digital Information

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Abstract:

The rapid growth of social media, online news platforms, messaging applications, and digital communication has made information available to people within seconds. However, this convenience has also created a serious problem: the rapid spread of fake and misleading news. False information can influence personal decisions, create unnecessary fear, damage the reputation of individuals or organizations, and even affect public opinion during important events. In everyday life, people frequently receive forwarded messages about health remedies, job opportunities,

government announcements, financial schemes, accidents, celebrities, and political events without knowing whether the information is genuine. Many users share such content before checking its source or accuracy.

The proposed system uses Natural Language Processing (NLP) and machine learning techniques to analyze the textual characteristics of news content. The system examines factors such as frequently used words, sentence patterns, emotional language, exaggerated claims, headline-content similarity, and other linguistic features that may indicate unreliable information. A dataset containing both genuine and fake news articles is cleaned and prepared before training and testing the classification model.

Different machine learning approaches can be evaluated to identify the model that provides the most reliable classification performance. The system accepts news text or a news statement as input and produces an understandable prediction indicating whether the content is likely to be genuine or fake. Instead of presenting only a technical prediction, the proposed approach is designed with everyday users in mind, allowing the result to be interpreted easily by people with limited technical knowledge.

The proposed system demonstrates the potential of combining language analysis and machine learning to support faster identification of suspicious news content. Its practical value is particularly important in situations where people receive information through WhatsApp groups, social media posts, online news portals, or forwarded messages and have limited time to verify the original source. By providing an early warning about potentially false information, the system can encourage users to pause and verify information before sharing it with family, friends, or colleagues. The system is not intended to replace professional fact-checkers or reliable news organizations; rather, it acts as a supportive first-level screening tool. This human-centered approach can help reduce the unnecessary spread of rumors and encourage more responsible digital communication.

The Fake News Detection System provides a practical approach to one of the major challenges of modern digital communication. By applying NLP and machine learning to news content, the system can assist users in recognizing potentially unreliable information in their daily online interactions. Its usefulness extends beyond academic research because trustworthy information is important for personal safety, health-related decisions, financial choices, education, and social awareness. Future improvements may include multilingual detection, source credibility analysis, real-time verification, explainable predictions, and integration with commonly used digital platforms.

Keywords: Fake News Detection, Natural Language Processing, Machine Learning, Misinformation, Digital Literacy

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Trustworthy GUI-Agents: Ai-Based Framework for Detecting and Resisting Manipulative User Interface

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Abstract: Autonomous graphical user interface (GUI) agents are increasingly capable of executing complex web and desktop tasks on behalf of users, automating online tasks such as information retrieval, comparison, purchasing, and service selection using AI. However, these agents operate within digital environments that may pose a fundamental risk: they fail to guarantee that the agent operates continuously in the user's best interests when encountering deceptive or manipulative digital designs intended to influence user decisions. Modern web systems often use dark patterns—deceptive interface elements like forced continuity, hidden costs, and privacy-invasive defaults. Although research has explored the detection of these patterns and AI agents' susceptibility to them, recognizing manipulation does not guarantee that an agent will effectively resist it.

This study proposes a human-centred safety framework for GUI agents. The proposed framework structures the agent's execution cycle into five distinct layers: GUI Observation, Manipulation Detection, Risk Assessment, Defensive Decision-Making, and Transparent Explanation. This framework will analyse interface elements and agent actions to identify potentially manipulative patterns, classify their risk, and determine an appropriate response. Using visual layout inputs and underlying document structures, the agent will identify the risk (financial implications, data privacy threat, and the overall degree of user deception), and depending on the identified risk, the agent may avoid the manipulative action, select a safer alternative, or request confirmation from the user. The methodology validates this architecture using a scenario-based experimental test environment featuring varied manipulation severities, establishing critical evaluation balances across standard precision, recall, and user autonomy safety metrics.

The proposed evaluation is expected to demonstrate whether integrating a dedicated safety layer can improve an agent ability to resist manipulative interfaces without substantially reducing task effectiveness. The findings will help examine the trade-off between autonomous task completion and user protection and identify appropriate levels of agent intervention. It is explicitly structured to protect users against systematic deception without adding prohibitive interaction latency.

Trustworthy GUI agents should prioritize not only task completion but also user autonomy, transparency, and protection from manipulative environments. This proposed framework advocates for a design shift in web automation agents towards ethical alignment, ensuring they serve as effective extensions of human users.

Keywords: Dark Patterns; Interface Manipulation; Human-Computer Interaction; Autonomous GUI Agents; Trustworthy AI



Neuromorphic Computing: Bridging the Gap between Biological Intelligence and Artificial Computation: A Step toward Energy-Efficient, Brain-Inspired Intelligent Computing Systems

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Abstract:

Artificial Intelligence is becoming part of many everyday devices, but running AI applications can require a considerable amount of computing power. This can be a challenge for devices such as mobile phones, sensors, and other battery-powered systems. Neuromorphic Computing is one approach that tries to address this problem by taking inspiration from the way the human brain processes information. Instead of keeping memory and processing separate, neuromorphic systems use brain-like networks in which neurons communicate through short electrical signals called spikes. This allows the system to process information only when it is needed and can help reduce power consumption. In this paper, the basic concept of neuromorphic computing and its working process are discussed along with its performance in comparison with conventional computing systems. The paper also looks at possible applications in areas such as robotics, smart devices, and healthcare. Along with its advantages, some of the current challenges, including software support and training of spiking neural networks, are also discussed. Finally, the paper considers how improvements in these areas could support the wider use of neuromorphic computing in future intelligent devices.

Keywords: Neuromorphic Computing, Brain-Inspired Computing, Spiking Neural Network, Low Power AI, Smart Devices

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The Missed Impacts of AI on India: From Natural Resources to Student Minds

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Abstract:

Artificial intelligence is widely celebrated for its efficiency gains, yet its rapid adoption in India generates severe, largely unexamined costs. This is particularly acute given India dual position as

the world most populous nation and a major site of AI infrastructure expansion — placing simultaneous pressure on its natural resources and its human capital. While existing research tends to treat environmental footprint and its cognitive effects on users as separate issues, this paper argues they must be examined together, since both are converging on the same population at the same time. Employing an integrative literature review of Indian infrastructural reports, environmental impact assessments, and psycholinguistic research on cognitive offloading, this study finds that data center expansion is placing unsustainable demands on India's electricity grid and water supply, while the same AI systems are simultaneously accelerating cognitive offloading among Indian students, weakening independent decision-making and critical thinking. These parallel findings point to a pattern of 'double depletion' — environmental and cognitive — that current policy does not address. The paper concludes by calling for stricter environmental regulation of AI infrastructure alongside a more deliberate, balanced approach to AI integration in education.

Keywords: Artificial Intelligence, Data Centers, India, Cognitive Offloading, Students



AI-Driven Predictive Analytics for Business Function Optimization and Strategic Decision-Making

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Abstract:

Organizations today generate vast volumes of operational, financial, and customer data, yet many still rely on retrospective reporting rather than forward-looking insight. Artificial Intelligence (AI)-driven predictive analytics addresses this gap by using machine learning algorithms to forecast future outcomes, identify hidden patterns, and support proactive strategic decision-making. This shift enables organizations to move from reactive management to anticipatory planning across functions such as sales, supply chain, finance, and human resources, thereby improving efficiency, reducing operational risk, and creating a sustainable competitive advantage in increasingly dynamic markets.

This study adopts a descriptive and analytical approach, drawing on secondary data from industry reports, case studies, and academic literature on AI adoption in business analytics. Predictive models, including regression-based forecasting, classification algorithms, and time-series analysis, are examined in the context of key business functions. A comparative framework is used to evaluate how organizations integrate predictive analytics tools into their existing decision-support systems, along with the organizational readiness factors that influence successful implementation.

Findings indicate that AI-driven predictive analytics significantly enhances forecasting accuracy in demand planning, customer churn prediction, and financial risk assessment compared to traditional statistical methods. Organizations leveraging predictive models report improved inventory optimization, more targeted marketing strategies, and earlier identification of at-risk customers or processes. However, the discussion also highlights persistent challenges, including data quality issues, integration complexity with legacy systems, a shortage of skilled analytics talent, and the need for greater model transparency to build managerial trust in AI-generated recommendations.

AI-driven predictive analytics represents a transformative capability for business function optimization, enabling data-informed strategic decisions that were previously constrained by manual analysis and delayed reporting cycles. For organizations to fully realize these benefits, investment in data infrastructure, cross-functional analytics skills, and governance frameworks that ensure explainability and ethical use of AI is essential. Future research should explore hybrid human-AI decision models that combine algorithmic precision with managerial judgment for more resilient and adaptive organizations.

Keywords: Predictive Analytics, Artificial Intelligence, Business Optimization, Strategic Decision-Making, Machine Learning.



Predictive Analytics and AI-Driven Models for Intelligent Decision-Making in Cloud Based Enterprises

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Abstract:

The rapid development of cloud computing has notably changed how enterprises manage data and make strategic choices. Predictive analytics and artificial intelligence (AI)-driven models are at the forefront of this change, allowing organizations to extract actionable insights from significant volumes of structured and unstructured records. This study explores the combination of predictive analytics and AI within cloud-based environments to enhance intelligent decision-making strategies. Using machine learning algorithms, deep learning techniques, and real-time information processing, cloud-based companies can predict trends, optimize operations, and mitigate risk effectively. The scalability and flexibility of cloud systems helps in enhancing the capabilities of AI-pushed models, allowing organizations to set up superior analytics without heavy infrastructure investments. This paper reviews the current literature, methods, and frameworks supporting predictive intelligence in cloud ecosystems. It also discusses implementations that require situations involving data privacy, model bias, and computational costs. The studies highlight how businesses across industries –

including finance, healthcare, and retail – benefit from predictive insights to capitalize on competitive advantages. Ultimately, the integration of AI-pushed predictive analytics in cloud environments is transforming enterprise decision-making in order to make it more proactive, data-driven, and efficient.

Keywords: Predictive analytics, artificial intelligence, cloud computing, machine learning, big data, intelligent decision-making, data-driven strategies, deep learning, business intelligence, real-time analytics

Introduction: In today's digital era, organizations are increasingly relying on data as a strategic asset to drive growth, innovation, and competitiveness. The proliferation of digital technologies, including the Internet of Things (IoT), social media, and enterprise systems, has led to an exponential increase in data generation. This surge in data, often referred to as big data, presents both opportunities and challenges for enterprises. While vast datasets offer valuable insights, extracting meaningful information requires advanced analytical tools and computational capabilities. Predictive analytics and artificial intelligence (AI) have emerged as powerful solutions to address this need, particularly when integrated with cloud computing technologies. Predictive analytics refers to the use of statistical techniques, machine learning algorithms, and data mining processes to analyze historical and current data in order to make predictions about future events. It enables organizations to identify patterns, trends, and relationships that may not be immediately apparent through traditional analysis. AI-driven models enhance predictive analytics by incorporating learning capabilities, enabling systems to improve their performance over time without explicit programming.

Cloud computing has revolutionized the way enterprises store, manage, and access data. By offering scalable, on demand computing resources, cloud platforms eliminate the need for costly infrastructure investments and provide flexibility for organizations to adapt to changing business needs. The integration of predictive analytics and AI within cloud environments creates a powerful synergy that supports intelligent decision-making. Enterprises can now process large datasets in real time, deploy sophisticated algorithms, and generate insights that drive strategic actions. One of the main benefits of using cloud-based predictive analytics is its ability to scale easily. Traditional on-premise systems often struggle to handle large volumes of data, especially during peak processing times. Cloud platforms, on the other hand, allow organizations to scale resources dynamically based on demand. This ensures efficient processing of data and enables real-time analytics, which is critical for time-sensitive decision-making. Additionally, cloud environments support distributed computing, allowing complex AI models to be trained and deployed efficiently.

Research Methodology: The research methodology adopted for this study is designed to provide a comprehensive analysis of predictive analytics and AI-driven models in cloud-based enterprises. The approach combines qualitative and quantitative methods to ensure a holistic understanding of the subject. The study begins with an extensive review of existing literature, followed by data collection, model development, and evaluation. The first step is to set clear goals and identify the questions that need to be answered the primary objective is to examine how predictive analytics and AI-driven models enhance decision-making in cloud-based environments. Secondary objectives

include identifying key technologies, evaluating their effectiveness, and analyzing implementation challenges. Based on these objectives, research questions are formulated to guide the study. The next stage involves data collection.. This study makes use of both primary and secondary data sources. Secondary data is obtained from academic journals, industry reports, and online databases. This data provides insights into existing trends, technologies, and applications of predictive analytics and AI. Primary data is collected through surveys and interviews with industry professionals, including data scientists, IT managers, and business analysts. These participants are selected based on their experience with cloud-based analytics systems.

Model evaluation is performed using overall performance metrics including accuracy, precision, recall, and F1 score. Cross validation techniques are used to ensure the reliability of the results. The performance of different models is compared to identify the most effective approach for predictive analytics. The research also includes a case study analysis to demonstrate the practical application of predictive analytics and AI in cloud-based enterprises.

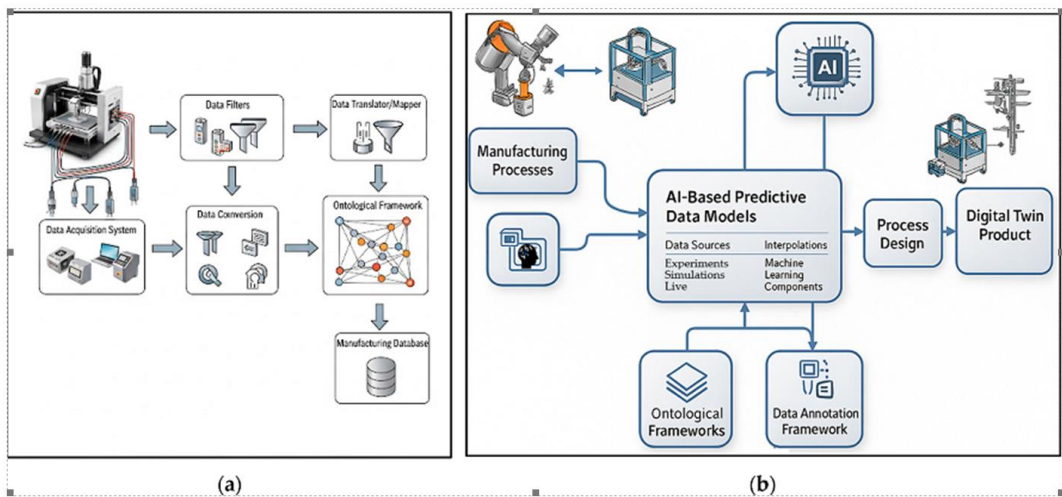


Fig 1: AI Driven Innovation in Manufacturing Digitalization

The case studies focus on organizations from different industries, highlighting how predictive models are used to improve decision-making processes. These case studies provide real-world insights into the benefits and challenges of implementing predictive analytics solutions. Benefits of predictive analytics and AI in cloud-based enterprises

- Enables data-driven decision-making with higher accuracy
- Provides real-time insights for faster business responses
- Enhances scalability and flexibility through cloud infrastructure
- Lowers operational expenses by removing the requirement for on-premise infrastructure.
- Improves customer experience through personalized services
- Supports risk management and fraud detection

- Helps to optimize resource allocation and operational efficiency
- Facilitates innovation and competitive advantage
- Allows predictable maintenance and reduces downtime
- Integrates easily with existing enterprise systems

Results and Discussion: The implementation of predictive analytics and AI-driven models in cloud-based enterprises has yielded transformative results across multiple domains, fundamentally reshaping how organizations operate, compete, and deliver value. One of the most significant outcomes observed is the enhancement of decision-making processes. Traditional decision making often relied on historical data analysis and human intuition, which could be slow and prone to errors. In contrast, AI-driven predictive models enable real-time analysis of vast datasets, allowing organizations to anticipate trends, identify opportunities, and mitigate risks with unprecedented accuracy. This shift has resulted in greater proactive and strategic decision -making, allowing enterprises to stay ahead in particularly competitive markets. Another key result is the improvement in operational efficiency. AI-powered systems can automate routine tasks, optimize workflows, and allocate resources more effectively. For instance, predictive maintenance models in cloud environments can analyze equipment data to forecast potential failures before they occur, reducing downtime and maintenance costs. Similarly, supply chain optimization models can predict demand fluctuations, streamline inventory management, and minimize waste. These efficiencies translate into cost savings and improved productivity, which are critical for business sustainability. Customer experience has also been significantly enhanced through the use of predictive analytics. AI models can analyze customer behavior, preferences, and interactions to deliver personalized recommendations and services. In cloud-based enterprises, this capability is amplified by the ability to process and analyze data from multiple touchpoints, such as websites, mobile apps, and social media platforms. Personalized marketing strategies, targeted promotions, and tailored customer support have become standard practices, leading to increased customer satisfaction and loyalty.

The scalability of cloud infrastructure has played a crucial role in enabling these results. Cloud platforms provide the computational power and storage capacity required to handle large-scale AI workloads. Enterprises can scale their operations up or down based on demand, ensuring optimal resource utilization. This flexibility has made advanced analytics accessible to a wider range of organizations, including startups and SMEs, although cost considerations remain a challenge. The effect of predictive analytics on innovation and competitiveness is really important and shouldn't be ignored. Enterprises that leverage AI-driven insights can identify emerging trends, develop new products and services, and adapt to changing market conditions more quickly than their competitors. This has led to the emergence of data-driven business models, where data is treated as a strategic asset. Companies are increasingly investing in data analytics capabilities to gain a competitive edge and drive innovation.

Conclusion: The integration of predictive analytics and AI-driven models into cloud-based enterprises represents a significant milestone in the evolution of modern business practices. These technologies have fundamentally transformed how organizations approach decision-making,

enabling them to move from reactive strategies to proactive and predictive approaches. By leveraging vast amounts of data and advanced analytical techniques, enterprises can gain deeper insights into their operations, customers, and market dynamics, ultimately leading to more informed and effective decisions. One of the most important conclusions that can be drawn from this discussion is that the value of predictive analytics lies not only in its ability to generate accurate predictions but also in its capacity to enhance organizational agility. In today's fast-paced and highly competitive business environment, the ability to quickly adapt to changing conditions is crucial. AI-driven models provide organizations with the tools needed to anticipate changes, identify opportunities, and respond to challenges in a timely manner. This agility is particularly important in cloud-based environments, where scalability and flexibility are key advantages.

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Intelligent NLP-Based Systems for Personalized Academic Guidance in Higher Education

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Abstract:

Higher education institutions are using Artificial Intelligence more and more to improve teaching, learning and student support. Academic guidance still depends mostly on teachers, counselors and staff. Students often need up-to-date information on courses, degree requirements, career options, skill development, exams and other academic choices. However, giving advice to a large number of students with different backgrounds, interests, goals and needs is very hard. Natural Language Processing offers a way to build systems that can understand student questions in everyday language and give helpful academic answers. This paper explores how NLP-based intelligent systems can

help create personalized easy-to-access and situation-aware academic guidance environments in higher education.

The study presents a framework for an academic guidance system. This system uses Artificial Intelligence and Natural Language Processing. Its main purpose is to understand student questions figure out the context behind them and deliver responses. The system can answer questions about subjects, courses, grades, career paths, skills, certifications and further educational opportunities. Natural Language Processing techniques help identify what a student truly wants to know. These methods also extract details from the conversation. Information such as the student's program, semester, interests and previous interactions adds context. This helps make the advice more relevant and meaningful.

The framework includes a knowledge base. This base stores data on programs course syllabi, academic policies learning resources and career options. It connects directly with the NLP tools and contextual data. Together they enable the system to generate responses that're both informative and tailored to each student. The goal is to provide guidance that fits each student's situation.

The proposed framework shows how AI-powered NLP systems can improve the quality and availability of guidance. These systems can offer help anytime reducing the time needed to get academic details. Personalized answers can guide students toward choices in their learning and careers. Using context may lead to accurate and relevant responses compared to systems that only search for keywords. Also, an intelligent academic guidance system can assist teachers and advisors by handling questions and tasks. But these systems only work well if the data is reliable the language is understood properly. Student privacy is protected. For academic or career decisions human involvement remains essential. So, AI assistance should be seen as a tool to support educators not as a replacement for them.

Language processing powered smart systems have potential to improve support services in colleges and universities. When these systems can understand how students speak and consider each student needs, they can offer smarter help. The approach described here lays the foundation, for building guidance tools that support students throughout their journey. Further research could focus on developing and testing a working version using student conversations and actual university data. Such studies could help create learning environments that respond faster focus on students and operate in smarter ways.

Keywords: Artificial Intelligence (AI), Natural Language Processing (NLP), Academic Guidance, Personalized Academic Learning, Higher Education

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The AI Value Paradox: From Adoption to Impact - Understanding the Factors that Drive Organizational AI Value Realization

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Abstract:

Artificial Intelligence (AI) has become a major part of the way organizations are approaching technology and business transformation. AI-based tools are now being used for analysing data, supporting decisions, automating routine tasks, interacting with customers, and improving different operational activities. As a result, organizations are investing heavily in AI and its adoption is increasing across industries. However, the growing adoption of AI does not always result in the level of organizational value that businesses expect from it. In many cases, the technology is available, but its effective use within the organization remains a challenge. This difference between adopting AI and actually gaining value from it forms the basis of this study. The research examines the AI Value Paradox and explores the factors that may determine whether AI adoption can be successfully converted into meaningful and measurable organizational outcomes.

A quantitative approach was followed to examine the factors associated with AI value realization. A structured questionnaire was designed around different aspects of AI implementation, including data readiness, technological infrastructure, employee AI literacy, management support, workflow integration, organizational readiness, trust, and responsible AI practices. Responses were collected from individuals having experience with or exposure to AI-based tools and organizational practices. The collected data were analysed using suitable statistical methods to understand the relationship between these factors and the value organizations perceive from AI. The study also examines which of the identified factors has a comparatively greater influence on successful AI value realization. The findings are used to develop an AI Value Realization Framework connecting the major factors involved in moving from AI adoption to organizational impact.

The analysis shows that simply introducing AI into an organization is not enough to ensure successful outcomes. The way AI is incorporated into everyday work appears to play an important role in determining the value obtained from it. Employee familiarity with AI, organizational preparedness, availability of usable data, management support, and the integration of AI with existing workflows are among the factors associated with better value realization. The study also brings attention to the role of trust and responsible AI practices, particularly when AI is involved in decision-making processes.

An important observation from the study is that AI adoption, AI usage, and AI value realization should not be considered the same thing. An organization may adopt an AI tool and even use it frequently without experiencing a significant improvement in its overall performance. Difficulties such as poor-quality data, lack of employee skills, weak integration with existing processes, limited organizational preparedness, and uncertainty regarding AI-generated decisions can reduce the value obtained from an otherwise capable technology. Therefore, the findings indicate that successful AI

transformation depends on a combination of technological capability and organizational readiness rather than technology alone.

The study highlights that the growing adoption of Artificial Intelligence is only one part of successful AI transformation. The real challenge lies in converting that adoption into outcomes that are useful and measurable for an organization. The AI Value Realization Framework proposed in this study brings together the technological, human, organizational, and governance aspects that can influence this transition. The research therefore shifts attention from simply measuring how widely AI is being adopted towards understanding how effectively organizations are able to create value from it. This perspective can help organizations make more informed decisions about AI investments and focus not only on adopting new technologies, but also on creating the conditions necessary for those technologies to deliver sustainable value.

Keywords: AI Adoption, AI Value Realization, AI Transformation, Organizational AI, AI Readiness, AI Literacy, Responsible AI, Business Value.



Detecting AI-Generated Text: A Comparative Analysis of Linguistic and Statistical Features for Academic Content Classification

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Abstract:

As large language models (LLMs) have grown in number, AI-generated text is becoming harder and harder to tell apart from human writing, which is a potential threat to academic integrity in higher education. In this study, a lightweight and interpretable hand-crafted language- and statistic-feature-based classifier to identify AI-generated text is proposed instead of using opaque deep-learning models. For each text sample, nine features were extracted, such as sentence-length burstiness, type-token ratio, punctuation density, and stop word ratio. A balanced set of samples written by humans and AI were created, and two classifiers, Logistic Regression and Random Forest, were trained and tested. Average word length and average syllables per word received the highest feature-importance scores in the Random Forest model, while the classifiers achieved 87.5% accuracy and an F1-score of 0.857 on the held-out test set. The results show that building a competitive detection system can be done with simple and transparent statistical components without using black-box commercial components, which is both an explainable and inexpensive method that can be adopted at academic institutions.

Keywords: AI, language, Human Writing, Academic Integrity, Random Forest Model



Engineered Living Therapeutics

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Abstract:

The modern requirements of medicine demand treatments that are directly aimed at the disease while minimising the adverse effects on healthy tissue. Engineered living medicine is the latest concept that uses genetically altered living organisms (e.g., bacteria, animal cells, or other microorganisms) to detect specific disease signals and produce targeted medicines in specific areas, rather than standard treatments. Unlike traditional medicines, these systems have the ability to detect changes in their environment and react to biological signals, and thus they can be more effective in treating challenging diseases such as cancer, metabolic disorders, digestive disorders, and infections. At the same time, several challenges exist, such as safety, control issues, stability, immune response, and delivery problems.

In order to examine the foundations and applications of engineered living therapeutics, the study makes use of a review-based approach. It provides insight into the selection of therapeutic organisms, genetic engineering approaches, biological sensing systems, production of therapeutic payloads, and targeted delivery methods. Various approaches are reviewed, including the possibilities of the use of engineered living therapeutics. Furthermore, important safety mechanisms are analysed, including limiting the survival of engineered cells outside the introduced environment and implementing genetic controls. The current applications, as well as emerging opportunities, are analysed in order to understand the potential for development of tailored treatments.

The research indicates that living therapeutics that have been engineered offer many benefits unlike traditional treatments. Engineered microbes can recognise biological conditions and react to only those signals tied to a pathological condition, which allows for a more targeted approach in their therapy. In oncology, modified living organisms or cells can be designed to detect the tumour environment and provide targeted therapy exactly at the site of the disease. In diseases of the intestines, metabolic disorders, and infectious conditions, similarly, living drugs might also act.

Since engineered drugs can interact, react, and perform important biological functions, the emergence of living therapies brings a new approach to treatment that is more advanced than traditional drug delivery. Nevertheless, there are obstacles that should be overcome, such as unintended biological activity, genetic instability, immune response, and other issues.

Engineered living therapeutics are viewed as a new breakthrough in medicine because they represent a blend of genetic engineering, synthetic biology, and therapeutic delivery. With these products having the ability to identify disease-related conditions, it might enable more precise treatment with fewer side effects. Nevertheless, present challenges connected to problems of safety,

regulation, stability, and the control of clinical trials should stop researchers from considering that this new medicine represents the next breakthrough in their research.

Keywords: Engineered Living Therapeutics, Synthetic Biology, Genetic Engineering, Therapeutic Cells, Living Medicines

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Artificial Intelligence and the Future of Work: Job Creation, Job Displacement and Skill Transformation

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Abstract:

Artificial Intelligence is quickly changing the way people work. It is also changing the way jobs are done. It is affecting how companies make decisions. More and more machines are learning. They are creating things. They are doing tasks that were once done by people. This is making work more efficient. It is helping businesses grow. It is also causing worries about people losing their jobs and more inequality. This paper looks at how Artificial Intelligence affecting jobs focusing on three main areas: creating jobs taking away jobs and changing the skills needed.

Artificial Intelligence is likely to take over simple and repeated tasks, especially in areas like handling data, running offices and making standard decisions. Artificial Intelligence can also create jobs in places, like building AI systems analysing data keeping digital systems safe managing AI use and offering online services.

The paper says the biggest problem is not just how many jobs are lost or gained but how the jobs that already exist are changing and what skills are needed for them. Learning all the time being able to use technology thinking clearly being creative and working with AI will become more and more important. The paper ends by saying that governments need to plan. Schools need to plan. Companies need to plan. They need to help people learn skills. The goal is to make sure that everyone can benefit from AI. The goal is to make sure that Artificial Intelligence helps create jobs. The goal is to make sure that Artificial Intelligence supports the economy. The goal is to make sure that this happens in an lasting way.

Keywords: Artificial Intelligence, Future of Work, Job Creation, Job Displacement, Skill Transformation, Reskilling, Automation.

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Global Perspectives on AI Adoption and Digital Inclusion

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Abstract:

Artificial Intelligence is becoming a technology of the digital economy. It is changing how people work, how they learn, how they get help from the government how they get money how they make things how they stay healthy and how they start businesses. Tools like AI, machine learning, smart automation and AI-based decision systems are helping companies and governments change how they make products how they do work and how they run their businesses. These changes also bring worries about how to manage AI, who is responsible how to keep information safe how to protect personal details how to help workers change jobs how to stop big companies from taking over and how to make sure everyone can use digital tools. This research looks at how an economy powered by AI can grow through ideas how companies plan, how governments make rules and how to manage AI properly. Different countries and areas have levels of internet access, computer systems money spent on technology skills people have how much information is available and how ready they are to use new technology. These differences affect how fast and where AI is used. The results show that AI can help the economy grow by making people better at their jobs helping make choices doing repeat work faster and making new products and services.. Just spending money on technology is not enough to make sure everyone benefits. Good systems, trained workers, trustworthy groups, good schools, ways to use data and good rules are all important. The study ends by saying that governments and companies should encourage ideas teach people digital skills do research make sure there is competition set rules for responsible AI make sure it is safe keep things private be open and make sure people are responsible. They must also ensure that small enterprises, nations, rural areas, women, students, and speakers of less prevalent languages have access to AI tools.

Keywords: Artificial Intelligence, AI-Powered Economy, Innovation Strategy, AI Governance, AI Adoption, Digital Inclusion, Digital Transformation, Responsible AI.

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AI-Driven Predictive Modelling and Decision Support System

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Abstract:

Artificial Intelligence AI-driven modeling and decision support systems are becoming very important tools for making better choices based on data in companies today. Old ways of making decisions usually rely on reports, manual work and human feelings. This can take a time and it is hard to deal with huge amounts of complicated data. AI-based predictive modeling uses machine learning, math and data to find patterns in data and guess what will happen next. When you connect this to a Decision Support System DSS these guesses turn into tips for managers, experts and other people who make big choices.

This paper looks at how AI-driven predictive modeling works and how it fits with decision support systems. The plan we suggest includes gathering data, cleaning data picking parts training the model making predictions and giving recommendations. You can use machine learning tools like regression, decision trees, random forests support vector machines and neural networks depending on what you need. This system can help people make decisions in healthcare, education, finance, business, manufacturing and agriculture. This study also talks about the wins, like better prediction accuracy finding risks early doing things automatically being faster and making better plans.. There are still hard parts like data quality, privacy, unfairness, in algorithms explaining how the AI works, security and the cost of setting it up.

Keywords: Artificial Intelligence, Predictive Modeling, Decision Support System, Machine Learning, Data Analytics, Prediction, Decision-Making.

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Impact of AI Code Assistants on Learning Programming: A Systematic Review, Extended Synthesis, and Preregistered Empirical Protocol

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Abstract:

The increasing adoption of artificial intelligence (AI) coding assistants, including GitHub Copilot and ChatGPT-based tools, is transforming the way programming is taught and learned. These

technologies can generate, explain, modify, and debug code, potentially improving coding efficiency and reducing the time required to complete programming tasks. However, improved task performance may not necessarily translate into deeper conceptual understanding, independent problem-solving ability, or long-term retention of programming knowledge. This study reviews research published from 2020 to mid-2025 to examine the influence of AI-assisted coding tools on programming education, with particular emphasis on beginner programmers. The review evaluates their effects on coding efficiency, task completion, conceptual learning, debugging skills, knowledge retention, transfer of programming knowledge, and learner dependence on AI-generated solutions. It also considers emerging concerns related to inaccurate or insecure code, academic integrity, privacy, fairness, and equitable access to AI technologies. The reviewed literature indicates relatively consistent improvements in short-term coding performance and task completion, whereas evidence regarding deeper learning, independent problem-solving, and knowledge transfer remains mixed. To address these research gaps, a preregistered, multisite randomized controlled trial is proposed to investigate the immediate and longer-term educational effects of AI-assisted programming. The proposed framework integrates programming performance, conceptual assessments, debugging tasks, transfer problems, learner reflections, and interaction data. It further examines whether structured instructional strategies, such as explanation requirements, code-review activities, and effective prompting guidance, can support productive AI use without replacing independent thinking. The study aims to strengthen the empirical foundation for AI-assisted programming education and provide evidence-based guidance for integrating AI tools while preserving programming competence, critical thinking, academic integrity, privacy, and equitable access.

Keywords: Artificial intelligence; AI code assistants; Git Hub Copilot; Chat GPT; programming education; novice programmers; learning outcomes; debugging; human–AI interaction; generative AI.

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AI-Powered Cybersecurity: Predicting and Preventing Cyber Threats in Smart Cities

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Abstract:

Artificial Intelligence, Smart Cities, Cyber security, Machine Learning and Internet of Things all work together. In Smart Cities many systems such as transportation, healthcare, electricity, surveillance and citizen services are linked by networks and Internet of Things devices. This connection makes life easier. Also creates more ways for bad actors to attack. Traditional Cyber

security methods rely on fixed rules, known signs and human watching. Those methods sometimes miss changing attacks. Artificial Intelligence offers a chance to make Cyber security stronger by looking at amounts of data from networks and systems and spotting unusual patterns. This study looks at how Artificial Intelligence can help predict, find and stop cyber threats before they harm Smart City life.

Machine Learning techniques are the focus of the proposed idea. The idea is to use data that comes from Smart City networks and Internet of Things devices. Things that are looked at include traffic on the network attempts to log in and how devices act. First the data is cleaned to remove mistakes and make sure the right features are ready for study. Then Machine Learning models are trained to tell apart behavior from behavior that might be harmful. The idea also uses anomaly detection to catch patterns that have never been seen before. The plan stresses watching, quick finding of problems and responding based on risk instead of only looking for known attack signs. In addition, privacy, data safety how reliable the model. The chance of false alarms is all important in building such a system. Result and Discussion an Artificial Intelligence framework for Cyber security can make Smart City systems better at spotting actions early. Machine Learning helps security teams by looking at network patterns and pointing out actions that need more attention. This is very useful in Smart Cities where the amount of security data is too much for people to read by hand. Still Artificial Intelligence is not a replacement for old Cyber security controls. The success of Machine Learning models depends a lot on how good and varied the training data. If the data is bad or biased the system may raise alarms or miss real threats. Bad actors can also try to trick Artificial Intelligence systems so it is important to watch the models and update them often. Therefore, combining Artificial Intelligence detection with proven security habits, human skill, access limits and incident response gives a solid approach.

Artificial Intelligence has power to support proactive Cyber security, in Smart Cities by finding abnormal behaviour and new threats quicker. A well-made Artificial Intelligence security plan can raise awareness of the situation and help people act faster on activities. At the time good data, regular testing of the model protection of privacy and human check are required for success. Of taking out old Cybersecurity tools Artificial Intelligence should join them to build a layered flexible safety plan. This way Smart City infrastructure becomes more safe, steady and trustworthy as city services grow more digital.

Keywords: Artificial Intelligence, Smart Cities, Cybersecurity, Machine Learning, Internet of Things.

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An Ethical AI Framework for Real-Time Bias Mitigation in Machine Learning

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Abstract:

The large-scale deployment of machine learning (ML) for high-stakes applications in areas such as credit loan approval, automated hiring decisions, and predictive policing has intensified the threat of systemic bias. These models are mathematically precise, yet frequently inherit, repeat, capitalize upon, and reinforce harms already evinced by historical training data streams. Automated human-system interactions today often contain no built-in check for how proxy variables (e.g., age, race, gender) are able to accurately imitate protected class outcomes, leading to negative-sum discriminator selection and violations of fair-lending and discrimination statutes. Existing mitigation approaches are often limited to static pre-processing solutions that break in the event of real-time data drift. This paper proposes a new paradigm and architecture for an AI ethical governance pipeline that optimizes raw predictive-accuracy-performance while simultaneously maintaining continuous production-system accountability.

Our architecture introduces a three-stage harm mitigation pipeline through which every model passes the moment it is generated: Pre-Processing Data Anonymization, In-Processing Semi-Adversarial Debiasing, and Post-Processing Output Certification. Continuous dynamic fairness test metrics (ex. Disparate impact ratios, equalized odds thresholds) inform the system as the model inference stream undergoes mathematical vectorization across groups, and the core algorithm adaptive adversarial retraining procedure automatically fines the system each time it uses demographic proxy features to generate protected class predictions. To test this framework, our methodology employs a scenario-based experimental simulation using publicly available real-world benchmarks (such as the COMPAS and Adult data) under highly skewed demographics and data drift Assumption 1 (in the event of not oversampling the minority class).

Our experimental protocol enables a granular examination of the trade-offs between baseline predictive accuracy and parity enforcement. Instead of simply blacklisting bias as a failed post-hoc data cleaning step, the framework observes how real-time system adjustments reduce systemic disparate treatment across an operational production system. The method is explicitly built to protect minority communities from technical discrimination without increasing computational latency or causing a baseline neural network learning breakdown.

Our research enables a new operational paradigm for predictive algorithms that treats ethical fairness as an essential variable, instead of an optional add-on. By inductively integrating discrimination-monitoring feeds into the in-day-to-day working of ML deployment, our pipeline offers a reproducible blueprint for the deployment of socially-responsible AI using existing

Computing construct of an invariant baseline model. This system guarantees that advanced machine learning engineering can be deployed usefully as an anti-discrimination tool accepted by the communities in which it works.

Keywords: Algorithmic Discrimination; Automated Fairness; False Negative Parity; Proxies; Systemic Bias.



AI-Powered DevOps: Transforming Software Development and Deployment

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Abstract:

AI-powered DevOps is becoming an important approach in modern software development. It combines Artificial Intelligence (AI) with DevOps practices to make the process of developing, testing, deploying, and monitoring software more efficient. In traditional DevOps, many tasks require continuous monitoring and manual decision-making. AI can help by analyzing system data, identifying unusual activities, predicting possible failures, and supporting automated testing and deployment. This can reduce repetitive work, improve software quality, and help development teams release applications more quickly. The use of AI in DevOps also provides opportunities for better system monitoring, faster problem detection, improved security, and more reliable software delivery. However, organizations may face challenges such as implementation cost, data privacy, lack of skilled professionals, and the need to check the accuracy of AI-based results. Proper planning and human supervision are therefore important for successful adoption. This paper discusses the role of AI in DevOps, its applications, benefits, challenges, and future scope in software engineering. AI-powered DevOps can support organizations in building software systems that are faster, more automated, and easier to manage.

Keywords: Artificial Intelligence, DevOps, AI Ops, Automation, Machine Learning, Software Development, Continuous Integration, Continuous Deployment.



Privacy-Preserving AI for Early Detection of Student Academic Risk

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Abstract:

Student academic risk is often identified only after a decline in attendance, assessment performance, engagement, or course completion has become difficult to reverse. Artificial Intelligence (AI) can help educational institutions recognize early warning signals and support timely intervention, but conventional predictive systems frequently depend on collecting and centralizing sensitive student information. This creates important concerns related to privacy, data security, transparency, consent, and the potential misuse of academic profiles. This paper proposes a privacy-preserving AI framework for the early detection of student academic risk that aims to balance predictive usefulness with responsible data protection. The proposed approach combines machine learning with privacy-aware techniques that institutions can identify meaningful risk patterns while minimizing exposure of personally identifiable and sensitive academic data. Rather than treating students as fixed risk categories, the framework is designed as an early-support mechanism that can help teachers and academic advisors understand changing learning patterns and provide appropriate assistance before difficulties become severe. The methodology considers relevant educational indicators such as attendance trends, assessment scores, assignment submission patterns, learning engagement, and academic progression. Data preprocessing, feature selection, and model training are performed with privacy as a core design requirement. Techniques such as data minimization, anonymization or pseudonymization, secure data handling, and federated learning can reduce the need to transfer raw student records to a central system. Where appropriate, differential privacy can further limit the possibility of inferring information about individual learners from model outputs. The framework also emphasizes explainable AI so that educators can understand the factors contributing to a risk prediction rather than relying on an unexplained score. Such transparency can improve trust and support fairer, more accountable decision-making.

The expected result is an intelligent early-warning system capable of identifying students who may benefit from academic support while reducing unnecessary exposure of their personal information. The approach can assist institutions in moving from reactive intervention to proactive and personalized support. However, prediction accuracy alone should not determine educational decisions. Potential issues such as algorithmic bias, incomplete data, false positives, and unequal access to support must be continuously evaluated. Human oversight should therefore remain central, with AI recommendations treated as decision-support information rather than final judgments about a student's ability or future performance. Overall, privacy-preserving AI offers a promising pathway for building safer, more ethical, and student-centered academic early-warning systems. By integrating privacy, explainability, fairness, and responsible governance into the design process,

educational institutions can use AI to detect academic risk earlier while protecting student dignity, autonomy, and trust.

Keywords: Privacy-Preserving AI, Student Academic Risk, Early Detection, Explainable AI, Educational Data Privacy

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The Role of Generative Artificial Intelligence in Transforming Education

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Abstract:

Generative Artificial Intelligence (Gen AI) is rapidly transforming the education sector by introducing new approaches to teaching, learning, content creation, and academic support. Technologies such as large language models, AI-based tutoring systems, and intelligent educational platforms can provide personalized learning experiences according to the needs and abilities of individual students. These systems can assist learners in understanding complex concepts, generating ideas, receiving instant feedback, and improving their problem-solving skills. At the same time, educators can use Generative AI to prepare learning materials, create assessments, summarize educational content, and support administrative activities.

However, the increasing use of Gen AI also introduces challenges related to academic integrity, misinformation, data privacy, overdependence on technology, and the development of critical-thinking skills. Therefore, its successful integration into education requires responsible and ethical use rather than complete dependence on AI-generated information. This paper explores the potential of Generative AI in improving educational accessibility, personalization, and efficiency while examining the major challenges associated with its adoption. The study emphasizes the importance of maintaining a balance between artificial intelligence and human involvement. With appropriate guidelines, digital literacy, and responsible implementation, Generative AI can become a powerful tool for enhancing the quality and effectiveness of modern education.

Keywords: Generative Artificial Intelligence, Education, Personalized Learning, AI in Education, Digital Learning, Academic Integrity, Artificial Intelligence

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Real-Time Computer Vision Pipeline for Crowd Density Estimation and Anomaly Detection in Large-Scale Gatherings

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Abstract:

Large-scale public assemblies, religious congregations, and institutional events remain persistently vulnerable to critical safety hazards such as localized crowd surges, stampedes, and hazardous bottleneck formation. Conventional surveillance infrastructure relies almost exclusively on continuous manual CCTV monitoring by human security personnel, whose vigilance is inherently constrained by cognitive fatigue, observational blind spots, and delayed reaction times during fast-evolving incidents. Since early precursors of crowd distress are exceedingly difficult to discern through manual observation alone, corrective interventions are typically initiated only after casualties or panic have already materialized. This operational gap underscores the pressing need for an automated, resilient computer vision framework capable of delivering continuous density estimation and instantaneous anomaly alerts under real-time constraints.

This study proposes an edge-native surveillance pipeline architected to interface seamlessly with existing commercial CCTV infrastructure via standard RTSP video streaming protocols, thereby eliminating the need for proprietary hardware upgrades. The pipeline fuses a lightweight YOLO-based detection module for pedestrian spatial localization with a DM-Count density regression network, both optimized through Tensor RT acceleration for low-latency deployment on resource-constrained edge processors such as the NVIDIA Jetson platform. Crowd dynamics are continuously characterized using spatiotemporal optical-flow analysis, while behavioural anomalies including abrupt velocity surges, panic-driven scatter entropy, and breaches of safe density thresholds are flagged through automated mathematical trigger conditions, generating instantaneous warning signals for security operators.

The proposed framework was rigorously validated against benchmark crowd datasets (Shanghai Tech and UCF-QNRF) as well as live edge camera feeds captured under challenging environmental conditions, including poor illumination and dense visual occlusion. The edge-deployed pipeline sustained an inference throughput of 31.2 frames per second (FPS) at 1080p resolution, ensuring uninterrupted real-time operation without perceptible latency. Quantitative evaluation of the density regression module yielded a Mean Absolute Error (MAE) of 47.8 and a Structural Similarity Index (SSIM) of 0.89, indicating strong correspondence with ground-truth crowd distributions. Notably, anomaly alerts were generated within 1.48 seconds of trigger-condition breaches, markedly outperforming conventional human monitoring response windows while preserving high detection precision.

This research demonstrates that existing institutional CCTV networks can be retrofitted into proactive, automated crowd-safety systems without necessitating costly proprietary hardware replacement. By delivering real-time density diagnostics alongside sub-two-second hazard warnings, the proposed vision architecture establishes an economically viable and highly scalable foundation for disaster-risk mitigation across smart campuses, transit hubs, and urban public infrastructure.

Keywords: Crowd Density Estimation; Computer Vision; Edge Computing; Anomaly Detection; Smart Campus Safety



AI-Driven Cooling Optimization in AI Data Centres: Evaluating Energy–Water Trade-offs for Sustainable Computing

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Abstract:

The rapid growth of artificial intelligence (AI) and high-performance computing has increased computational demand in data centers, resulting in greater heat generation and increased cooling requirements. Conventional cooling systems can maintain safe operating temperatures, but fixed or conservative control strategies may not adapt efficiently to changing workloads and thermal conditions. At the same time, cooling itself requires considerable energy, while some cooling technologies also consume water. Existing research shows that AI-based methods such as machine learning, temperature forecasting, reinforcement learning and model predictive control can improve the operation of cooling systems. However, cooling technologies also involve different energy, water, carbon, thermal and cost trade-offs. Despite these findings, existing studies do not consistently evaluate AI-driven cooling approaches across these interconnected sustainability factors and practical deployment conditions.

This study presents a literature-based comparative analysis of existing research on AI- driven cooling optimization and advanced cooling technologies for AI data centers . Relevant studies are reviewed and categorized according to their AI approach, cooling strategy, control mechanism and evaluation criteria. The analysis considers energy consumption, water use, thermal safety, computing performance and practical applicability where reported in the reviewed studies. Studies involving machine learning- based cooling optimization, cooling-load and temperature forecasting, reinforcement learning-based control, and coordinated thermal management are examined alongside research comparing air, liquid, immersion and hybrid cooling systems. PUE, WUE, CUE, thermal violations and operating cost are considered as important sustainability indicators.

The reviewed literature indicates that AI can improve cooling efficiency by predicting thermal conditions and dynamically adjusting cooling operations rather than relying only on fixed settings. Real-world research has also demonstrated the feasibility of using data-driven control to regulate temperature and airflow while maintaining operational safety. These approaches can make cooling more responsive to changing workloads, but their effectiveness depends on the data available, control constraints and characteristics of the data-centre environment.

However, the comparison of cooling technologies shows that no single cooling method is universally optimal. Wet cooling can provide better energy efficiency but requires water, whereas dry cooling can reduce direct water consumption but may require more energy under hot climatic conditions. Therefore, evaluating AI-driven cooling only through energy savings may provide an incomplete view of sustainability. The literature further highlights challenges related to safety, limited data, transferring methods from simulation to real systems, ageing infrastructure, and differences between data-center environments. These findings suggest that efficiency improvements should be considered together with resource use, reliability and practical deployment requirements.

The study concludes that sustainable AI data-center cooling requires a multi-dimensional evaluation rather than focusing on energy efficiency alone. AI-driven control has significant potential to improve cooling operation, but its sustainability should be assessed alongside water consumption, thermal reliability, computing performance and deployment conditions. Based on the reviewed literature, the study proposes a conceptual framework for evaluating AI-driven cooling approaches through these interconnected factors. Such an approach can help identify when an AI-based cooling strategy provides meaningful efficiency gains without shifting environmental or operational burdens from one resource to another.

Keywords: Artificial Intelligence; Data Centre Cooling; Energy Efficiency; Water Sustainability; Thermal Management



Neo 4J Meets AI: Turning Connected Data into Smart Insights - Modern and Engaging

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Abstract:

In today's rapidly growing digital world, Artificial Intelligence (AI) depends on large amounts of connected and complex data. Traditional databases often face difficulties in efficiently representing relationships between different data entities. Neo4j, a graph database, addresses this challenge by

representing information through nodes, relationships, and properties. Its graph-based structure makes it useful for AI applications such as knowledge graphs, recommendation systems, fraud detection, and intelligent search.

Neo4j stores and manages connected data using a graph model. AI systems can use this structured information to identify patterns, understand relationships, and support intelligent decision-making. Neo4j uses the Cypher query language to efficiently retrieve and analyze connected data. Its integration with AI and machine learning techniques can improve the understanding and processing of complex datasets.

The combination of Neo4j and AI can provide faster relationship analysis, improved recommendations, better pattern detection, and more meaningful insights from connected data. It is particularly useful in areas such as social networks, healthcare, cybersecurity, fraud detection, and personalized recommendation systems. However, challenges such as data quality, scalability, security, and the complexity of integrating AI technologies need to be considered.

Neo4j provides an effective approach for managing highly connected data and supporting Artificial Intelligence applications. By combining graph-based data management with AI, organizations can discover hidden relationships, improve decision-making, and develop more intelligent systems. As AI continues to evolve, graph databases such as Neo4j can play an important role in building smarter and more connected applications.

Keywords: Neo4j, Artificial Intelligence, Graph Database, Knowledge Graph, Machine Learning, Connected Data, Data Analytics



Artificial Intelligence in Politics: Transforming Governance, Policymaking and Electoral Processes

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Abstract:

Artificial Intelligence (AI) is emerging as a powerful force reshaping the way government's function and political processes unfold across the world. From automated policy analysis and voter sentiment tracking to AI-driven election campaigns and misinformation detection, AI technologies are increasingly influencing how leaders govern and how citizens engage with democratic institutions. Governments are adopting AI tools for data-driven decision-making, e-governance, and public service delivery, while political parties use AI-powered analytics to design targeted campaign strategies and understand voter behaviour at a large scale. Social media platforms further

amplify this shift, using AI algorithms to curate political content, shape narratives, and influence public discourse in real time. However, this growing dependence on AI also raises serious concerns regarding data privacy, algorithmic bias, manipulation of public opinion, and the erosion of democratic accountability. This paper examines the dual role of AI as both an enabler of efficient governance and a potential threat to fair political processes.

This study adopts a descriptive and analytical approach based on secondary data collected from research journals, government reports, news articles, and case studies related to the use of AI in political systems across various countries. Comparative analysis has been used to understand how AI applications differ in democratic and authoritarian setups, and content analysis of recent elections has been carried out to identify patterns of AI-driven campaigning and misinformation. Reports published by election commissions and technology policy think tanks were also reviewed to assess existing regulatory responses to AI in the political domain.

The findings reveal that AI is playing a dual role in politics. On the positive side, it enhances governance efficiency through predictive policymaking, automated public grievance redressal, and real-time monitoring of welfare schemes. AI-based chatbots and virtual assistants are improving citizen-government interaction, while data analytics help policymakers design more responsive programmes and allocate resources more effectively. On the negative side, AI has also become a tool for political manipulation through deep fakes, micro-targeted disinformation, and algorithmically amplified propaganda, which can distort public opinion and threaten electoral integrity. The study further finds that countries lacking strong regulatory frameworks are more vulnerable to the misuse of AI in political communication, whereas nations with clear AI governance policies, transparent data-protection laws, and independent oversight bodies are better positioned to harness its benefits responsibly.

Artificial Intelligence holds immense potential to strengthen governance, improve policymaking, and make political systems more transparent and citizen-centric. However, its unchecked use also poses significant risks to democratic values, electoral fairness, and public trust. It is therefore essential to develop robust ethical guidelines, transparent algorithms, and strict regulatory frameworks to ensure that AI is used as a tool for empowering democracy rather than undermining it. A balanced approach involving policymakers, technologists, election authorities, and civil society is crucial for the responsible integration of AI into political systems, so that its benefits are maximised while its risks to fair and free elections are minimised.

Keywords: Artificial Intelligence, Politics, Governance, Policymaking, Elections.



Humanoid Robots

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Abstract:

Machines built like people to handle walking, looking around, speaking, and working are known as humanoid systems. Thanks to major breakthroughs in computing power, sensor technology, motor control, and neural networks, these machines are getting much better at tricky operations. Famous units like ASIMO, Sophia, Atlas, Pepper, and Ameca prove how different labs tackle upright walking, verbal chats, and social interaction. People use these platforms in factories, hospitals, schools, crisis zones, and space missions.

The idea of building human-shaped robots goes back decades, but real progress took off alongside leaps in electronics, computing, and mechanical engineering. Usually, a humanoid body features a head, torso, arms, hands, and legs built to match human proportions. Like Honda's ASIMO as a primary milestone; which proved that stable two-legged walking, stair climbing, and jogging was possible. Hanson robotics-built Sophia to centre entirely on social dialogue and facial expressions. Boston Dynamics shaped Atlas to handle heavy balance, rough terrain, and raw physical tasks. Soft Bank created Pepper for customer service roles, while Engineered Arts designed Ameca to showcase fluid facial reactions. Each project shows different engineering paths, with some targeting physical strength and others focusing on conversation.

Humanoid robotics blends mechanical engineering, artificial intelligence, and human-machine studies into one big field. The multi findings suggest that machines like ASIMO, Sophia, Atlas, Pepper, and Ameca can support humans across manufacturing, hospitals, schools, and rescue missions, and provided solutions toward issues with cost, battery life, and safety. Overall, careful research band thoughtful planning will ensure they truly benefit society.

Keywords: Humanoid Robots, Artificial Intelligence, Machine Learning, Robotics, Human-Robot Collaboration.



Digital Privacy in the Age of Artificial Intelligence

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Abstract:

Artificial Intelligence (AI) has rapidly become an important part of modern digital life, supporting applications such as virtual assistants, recommendation systems, facial recognition, online advertising, healthcare, education, and financial services. These systems depend heavily on large amounts of personal and behavioural data. Although AI can improve efficiency, personalization, and decision-making, its increasing use also creates serious concerns about digital privacy. The collection, processing, prediction, and sharing of personal information may expose individuals to unauthorized access, profiling, surveillance, discrimination, and misuse of sensitive data. This paper examines the growing relationship between AI and digital privacy and highlights the need for responsible data practices in an increasingly intelligent digital environment.

This study follows a qualitative and descriptive approach based on a review of existing literature, research papers, privacy principles, and discussions related to Artificial Intelligence and data protection. The study focuses on major privacy challenges associated with AI, including excessive data collection, lack of transparency, automated profiling, data breaches, facial recognition, and the secondary use of personal information. It also examines commonly proposed privacy-preserving approaches, such as data minimization, anonymization, encryption, privacy-by-design, user consent, access controls, and human oversight. The information was organized thematically to understand the major risks and possible safeguards.

The study indicates that AI can increase privacy risks because intelligent systems can derive detailed information from seemingly ordinary datasets. Even when users provide data for a specific purpose, AI systems may combine different sources to create behavioural profiles and make predictions about individuals. Weak transparency can make it difficult for users to understand what information is collected, why it is used, and how automated decisions are made. At the same time, privacy-preserving technologies and responsible governance can reduce these risks. Techniques such as anonymization, encryption, federated learning, differential privacy, and strict access controls can help limit unnecessary exposure of personal information. However, technology alone is not sufficient. Organizations must establish clear privacy policies, collect only necessary data, provide meaningful user choices, conduct regular security assessments, and ensure accountability for AI-based decisions. Public awareness and digital literacy are equally important because informed users are better able to recognize privacy risks and protect their information.

Artificial Intelligence offers significant benefits, but its responsible development requires digital privacy to remain a central consideration rather than an afterthought. Protecting personal information requires a balanced approach that combines secure technology, ethical AI development, transparent data practices, effective governance, and informed users. Privacy-by-design should be

incorporated throughout the AI lifecycle, from data collection to deployment and monitoring. By adopting these measures, society can encourage innovation while reducing unnecessary surveillance, misuse, and exposure of personal data. The future of AI should therefore be built on the principles of security, transparency, accountability, and respect for individual privacy.

Keywords: Artificial Intelligence, Digital Privacy, Data Protection, Privacy-Preserving AI, Ethical AI.



Changing Higher Education through Smart AI-Based Learning Systems

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Abstract:

In today's colleges, students usually learn at a single, fixed pace inside regular classrooms. Although, every student grasps concepts differently and has their own unique strengths. Because of their rigid setup, students sometimes feel left behind or lose interest midway. To bridge this gap, teachers and developers are now looking at smart AI tools to make studying more personal and supportive. This study looks at how adaptive learning systems can make college education better by adjusting study material according to what each student actually needs. In this study, to approach similar theory, a simple tracking approach with a group of 120 students over a semester was established.

The results turned out quite positive. Students using the smart system remembered things better, showing about a 28.5% increase in topic retention, and fewer students dropped or lagged behind compared to the normal group. The system also made it much easier for teachers to spot who needed extra help early on.

Additionally, smart learning system was also found to provide a very helpful way to support college students without replacing the core classroom experience. Instead of forcing everyone into the same rigid routine, digital systems were found to help students learn comfortably at their own pace. Over all, such digital systems can progressively present the student stress levels, making higher education a friendlier and more effective experience for everyone.

Keywords: Smart Learning, Student Progress, Personal Study Support, Classroom Tech.



Artificial Intelligence and Environmental Sustainability: Assessing the Ecological Impact of Modern Computing

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Abstract:

Artificial Intelligence (AI) has become an integral part of modern technology, enabling faster coding, problem-solving, data processing, and application development. However, the rapid growth of AI-driven technologies also raises important questions about their environmental impact. While users primarily interact with screens and software, the physical infrastructure operating behind these technologies—including large-scale data centers—requires substantial amounts of electricity to power and cool servers continuously. This energy demand can contribute significantly to carbon emissions, particularly when electricity is generated from fossil-fuel-based sources. At the same time, AI is increasingly being used to monitor pollution, optimize energy consumption, predict weather patterns, and support sustainable technologies, creating a complex relationship between AI and the environment.

To examine this relationship, technology blogs, research publications, university studies, and technical reports on data centers and computing infrastructure were reviewed. Particular attention was given to hardware energy consumption, cloud computing, server infrastructure, and the substantial computational requirements associated with training complex AI models. Real-world applications of machine learning in areas such as weather monitoring, renewable-energy forecasting, smart power grids, and traffic management were also considered. The analysis focuses on connecting everyday computing activities, software development, and increasing server workloads with their broader environmental consequences.

The review highlights the considerable amount of electricity required to train and operate large AI models. Data centers operating continuously can generate significant energy demands, while dependence on conventional electricity grids may increase their associated carbon footprint. Even individual AI queries have an energy cost, although the magnitude varies according to the model, hardware, workload, and data-center infrastructure. Conversely, AI offers significant opportunities for improving environmental sustainability. Intelligent systems can optimize traffic signals, reduce vehicle idling, improve energy distribution, forecast solar and wind power generation, and support more efficient resource management.

Overall, AI represents both an environmental challenge and a potential solution. Reducing its environmental footprint requires greater emphasis on energy-efficient algorithms, optimized software, efficient computing hardware, sustainable data-center design, and increased use of renewable energy. Environmentally responsible software development can further reduce unnecessary computational workloads. Integrating sustainability into the design and deployment of

AI technologies can help maximize their benefits while minimizing their impact on the environment.

Keywords: Artificial Intelligence; Environmental Impact; BCA Student Perspective; Green Computing; Carbon Footprint.



From Digital Archives to Living Memory: Designing AI Systems for the Preservation of Intergenerational Cultural Knowledge

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Abstract:

The rapid transformation of society through digital technologies has created new opportunities for preserving cultural knowledge, yet a significant portion of human heritage continues to exist primarily in the memories and experiences of older generations. Stories, traditional practices, local languages, family histories, indigenous skills, and community knowledge are often transmitted orally and may gradually disappear as intergenerational connections weaken. Conventional digital archives can store photographs, documents, audio recordings, and videos, but they generally function as static repositories and provide limited understanding of the relationships, context, and meaning associated with such knowledge.

This paper proposes a conceptual framework for transforming conventional digital archives into “living memory” systems through the integration of Artificial Intelligence (AI). The proposed framework explores the use of Natural Language Processing, speech recognition, semantic search, and knowledge graphs to capture, organize, contextualize, and retrieve intergenerational cultural knowledge. Instead of merely storing historical information, an AI-enabled living memory system could connect oral narratives with people, places, traditions, languages, events, and related digital resources, allowing younger generations to interact with cultural knowledge in a more meaningful and accessible manner. The approach positions AI not as a replacement for human memory but as a technological bridge between generations, supporting the continuity of knowledge while retaining human contribution and cultural context. The study further highlights challenges related to privacy, data ownership, cultural authenticity, algorithmic bias, and the ethical representation of community knowledge. A human-centred approach is therefore proposed to ensure that technological advancement does not compromise the identity and ownership of cultural communities. The framework has particular relevance to culturally diverse societies such as India and Japan, where technological innovation can support the preservation and transmission of traditional knowledge.

Ultimately, the proposed concept aims to demonstrate how AI can evolve digital preservation from passive storage toward an interactive and sustainable form of living cultural memory.

Keywords: Artificial Intelligence, Digital Archives, Living Memory, Cultural Heritage, Intergenerational Knowledge, Natural Language Processing, Knowledge Graphs, Digital Preservation, Human-Centred AI, India–Japan Collaboration



The Unknown Unknowns: Can AI Discover Emerging Threats before they become Societal Problems?

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Abstract:

Artificial Intelligence (AI) has become an important technology for building smart and resilient societies by enabling automated prediction, pattern recognition, anomaly detection, and intelligent decision-making. However, most AI systems are designed to identify patterns and problems that are already represented in their training data. This creates a significant limitation when a completely new type of event, threat, or abnormal pattern emerges. Such situations can be described as “unknown unknowns”—problems that are neither explicitly known nor adequately represented in the data used to train an AI system. In rapidly changing digital and physical environments, the inability to recognize such unfamiliar situations may reduce the reliability and resilience of intelligent systems. Therefore, this paper explores whether AI can be designed to identify emerging threats before they develop into larger societal problems.

The study proposes a conceptual framework that combines anomaly detection, uncertainty estimation, continual learning, and adaptive pattern discovery. Instead of relying only on predefined classes or previously observed patterns, the proposed approach continuously examines incoming data for unusual changes and unfamiliar signals. An uncertainty-aware layer can help the system distinguish between a confident prediction and a situation that falls outside its learned knowledge. Continual learning mechanisms can then allow the system to incorporate newly identified patterns without completely replacing its existing knowledge. The framework also considers human-in-the-loop validation, where potentially significant unknown patterns can be reviewed before being treated as confirmed threats. This approach aims to shift AI from a purely reactive prediction system towards an adaptive early-warning system.

The proposed framework indicates that combining unfamiliarity detection with uncertainty estimation can provide an additional layer of intelligence for dynamic environments. Instead of asking only whether an event belongs to a known category, the system can also ask whether the

event itself is sufficiently different from previously observed situations. This capability could be valuable in areas such as cybersecurity, fraud detection, infrastructure monitoring, digital services, and disaster preparedness, where new forms of threats may emerge without historical examples. However, detecting an unknown pattern does not automatically mean that it represents a genuine threat. False alarms, incomplete data, changing environments, and model limitations remain important challenges. Human validation and continuous system evaluation are therefore essential for responsible deployment.

The future of resilient AI should not be limited to making better predictions about known situations. Intelligent systems should also be capable of recognizing the boundaries of their knowledge and identifying signals that do not fit existing expectations. By developing AI that can search for the “unknown unknowns,” societies may gain earlier awareness of emerging risks and improve their ability to adapt to unexpected situations. Such systems could contribute to the development of more proactive, reliable, and resilient smart societies.

Keywords: Artificial Intelligence, Unknown Unknowns, Anomaly Detection, Uncertainty Estimation, Societal Resilience



Balancing AI Adoption and Data Privacy: A Critical Management Challenge in Modern Business

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Abstract:

Companies today use Artificial Intelligence (AI) for many tasks, such as recommending products, approving loans, and answering customer queries through chatbots. To do this well, AI needs large amounts of personal data, like a customer shopping history, income, or location. This creates a challenge for businesses: they want to use AI to grow, but they must also protect customer data and follow privacy laws. In India, the Digital Personal Data Protection Act now makes this even more important, as companies can face heavy penalties for misusing personal data. This study looks at how businesses can adopt AI while keeping customer data safe.

This paper uses a review of existing research papers, news reports, and case studies from banking, e-commerce, and healthcare sectors. It studies how these industries collect, use, and protect data while running AI systems. It also looks at India data protection rules to understand what businesses are legally required to do.

The study finds that businesses which explain clearly to customers how their data is used gain more trust and loyalty. Common good practices include collecting only the data that is truly needed, storing data securely, asking for clear customer consent, and letting AI systems work on anonymised data wherever possible. Companies that ignore these steps risk losing customer trust, facing legal fines, and damaging their brand image. However, many small and medium businesses find it hard to follow these rules because of limited budget and technical staff. Simple, low-cost tools and staff training can help such companies stay compliant.

AI adoption and data privacy do not have to work against each other. With clear policies, honest communication with customers, and basic security practices, businesses can use AI responsibly and still follow the law. As AI use grows across India, every business, big or small, needs a simple data privacy plan alongside its AI plan. This will help build long-term customer trust and avoid legal problems.

Keywords: Artificial Intelligence, Data Privacy, Digital Personal Data Protection Act, Business Ethics, Customer Trust.

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AI-Enabled Smart Waste Management: A Predictive and Adaptive Framework for Sustainable and Resilient Urban Communities

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Abstract:

Taking care of waste in cities that are growing more and more has become way more than about keeping public areas clean. According to the UNEP Global Waste Management Outlook 2024 the amount of waste created by cities is expected to go up from about 2.1 billion tonnes in 2023 to 3.8 billion tonnes by 2050. In India the Swachh Bharat Mission-Urban 2.0 also aims to make cities free of garbage and improve the way municipal waste is handled and processed. This paper looks at how Artificial Intelligence can be used to make waste management quicker more efficient and better for the changing needs of cities.

A framework that uses Artificial Intelligence for waste management is offered in this study. The framework combines data from smart-bin sensors past collection records GPS-enabled waste-collection vehicles, old waste-generation patterns, weather, traffic and the features of areas. This data can be looked at using machine-learning methods to predict waste levels and find places where waste collection might be needed earlier.

The predictions can then be used by a system that finds the ways to plan collection schedules and the best routes for vehicles. Computer vision can also be used at waste collection and sorting points to help tell types of waste apart. The main goal of the framework is not just to find where waste is but to predict when collection will be needed and how much collection capacity might be needed.

Existing studies show that using Artificial Intelligence, smart sensors, ways to improve things and data-based ways to plan routes can make many parts of waste collection better. The results depend on the quality of the data how well the sensors work and are kept up waste separation, the technical systems in place and how well city officials can use the information. Because of this the suggested framework sees Artificial Intelligence as a tool to help make decisions not as something that replaces city workers. The system can help officials decide where to collect waste cut down on unnecessary trips use the vehicles better react faster to bins that are full and plan better for places where waste is processed.

The framework suggested here shows a path for using Artificial Intelligence in city waste management especially in places where the resources and digital systems are not the same everywhere. Things, like the distance of routes how much fuel is used how fast the response is, how well the collection works, how much the vehicles are used and the results of processing waste can be used to see how well it works.

Keywords: Artificial Intelligence, Smart Waste Management, Predictive Analytics, Route Optimization, Sustainable Cities



Beyond Adoption: Balancing Artificial Intelligence Innovation with Data Privacy in the Modern Business Environment

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Abstract:

The rapid integration of Artificial Intelligence (AI) into modern business has transformed the way organizations collect data, interact with customers, automate processes, and make strategic decisions. However, the growing dependence on data-driven AI systems has created a critical managerial challenge: how can organizations pursue AI-driven innovation without compromising data privacy and stakeholder trust? While AI adoption offers significant opportunities for efficiency, personalization, and competitive advantage, it simultaneously raises concerns surrounding excessive data collection, unauthorized use, algorithmic transparency, security, informed consent, and accountability.

This study investigates the emerging tension between AI adoption and data privacy, focusing on the role of user awareness, perceived privacy risks, trust, and responsible organizational practices. It seeks to examine how individuals perceive the privacy implications of AI-enabled technologies and whether concerns regarding personal data influence their willingness to adopt and engage with AI systems. The study further explores the responsibility of businesses in establishing effective data-governance mechanisms while maintaining innovation and competitiveness.

A quantitative, survey-based research approach will be adopted to assess perceptions and attitudes toward AI adoption and data privacy among users of AI-enabled technologies. The study aims to identify the major factors shaping trust and privacy concerns and to develop practical recommendations for responsible AI governance.

The research argues that successful AI adoption should not be measured solely by technological advancement or business efficiency, but also by the ability to protect privacy, establish transparency, and earn stakeholder trust. The study therefore contributes to the growing discourse on responsible AI by highlighting the need for a balanced approach in which innovation and privacy function not as competing priorities, but as complementary foundations of sustainable digital business.

Keywords: Artificial Intelligence, AI Adoption, Data Privacy, Responsible AI, Data Governance, Trust, Business Innovation, Ethical AI



Green Database Management for IoT-Enabled Sustainable Agriculture

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Abstract:

Agriculture is increasingly adopting Internet of Things (IOT) technologies for real-time monitoring and intelligent resource management. IOT sensors can continuously collect information related to soil moisture, temperature, humidity, rainfall, water availability, crop conditions, and environmental parameters. Although these technologies improve agricultural decision-making, they also generate large volumes of data that require continuous transmission, processing, and storage. Conventional database systems are generally designed to maximize performance and availability without explicitly considering energy consumption and environmental impact. Continuous sensor communication, repeated data storage, redundant records, frequent database queries, and unnecessary data retention can increase computational workload and energy consumption. This contributes indirectly to the carbon footprint of digital agricultural systems. Therefore, there is a need for sustainable database management approaches that can handle IOT-generated agricultural

data efficiently while reducing energy and resource consumption. This study proposes a Green Database Management approach for IOT-enabled sustainable agriculture. The approach integrates green computing principles with database management techniques to improve the sustainability of agricultural data systems. The study focuses on reducing unnecessary data transmission, processing, storage, and retrieval operations while maintaining acceptable database performance.

The proposed approach consists of data acquisition, preprocessing, green database management, and decision support. IOT sensors collect agricultural data, which is initially processed at the edge or gateway to remove redundant and unnecessary records. The database applies data aggregation, efficient indexing, adaptive data retention, compression, and energy-aware query processing. The proposed approach considers both conventional database performance and sustainability parameters. Response time, storage utilization, computational overhead, energy consumption, and estimated carbon footprint are considered for evaluation.

The proposed approach is expected to reduce redundant data storage, unnecessary transmission, and computational workload. Data preprocessing and aggregation can reduce the volume of data stored and transferred, while efficient indexing and query optimization can maintain database performance. Adaptive data retention can further reduce storage requirements. The approach provides a framework for analyzing the trade-off between database performance and environmental sustainability in IOT-based agriculture.

Green database management can support the development of sustainable digital agriculture by reducing the energy and resource requirements of IOT data management. The proposed approach integrates green computing principles with database optimization techniques while considering carbon footprint as an additional performance parameter. Future work will focus on prototype development, experimental validation using agricultural IOT datasets, and AI-based optimization for dynamic energy-efficient database management.

Keywords: Green Database, IOT, Sustainable Agriculture, Energy Efficiency, Carbon Footprint



Leveraging Artificial Intelligence in Predictive Analytics for Enhancing Business Operations and Informed Strategic Planning

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Abstract:

Predictive analytics powered by artificial intelligence (AI) has become a decisive lever in modern business strategy, transforming raw operational and market data into forward-looking insight that shapes decision-making across every business function. This paper examines how AI-driven predictive analytics is applied to optimise core business functions, including supply chain and

demand forecasting, marketing and customer behaviour prediction, financial risk assessment, and human capital management, and how these applications feed into strategic decision-making at the organisational level (Davenport & Harris, 2007; Provost & Fawcett, 2013). Machine learning and deep learning techniques, including time-series models, ensemble methods, and transformer-based architectures, allow organisations to move from descriptive reporting toward anticipatory, adaptive decision systems (Ramasamy & Elzubair Gasm Alsid, 2025). Evidence from recent empirical and industry research indicates that AI-enabled predictive systems can shorten decision latency, improve forecast accuracy, and increase return on investment relative to traditional statistical baselines.

However, the effectiveness of these systems depends heavily on data quality, organisational readiness, and the interpretability of model outputs for non-technical decision-makers (Al-Naemi & Botella-Carrubi, 2026). This paper reviews the mechanisms, applications, and limitations of AI-driven predictive analytics in business optimisation, arguing that its greatest strategic value emerges when predictive output is embedded within a broader framework of human judgement, ethical oversight, and organisational change management, rather than treated as a standalone technical solution.

Keywords: Predictive Analytics, Artificial Intelligence, Business Optimization, Strategic Decision-Making, Machine Learning, Decision Support Systems, Data-Driven Decision-Making, Business Intelligence

Introduction: Business decision-making has historically relied on a combination of experience, intuition, and retrospective reporting. Over the past decade, this paradigm has shifted decisively toward data-driven decision-making, in which organisations use statistical and computational tools to anticipate outcomes rather than merely record them (Brynjolfsson & McElheran, 2016). Predictive analytics, defined as the use of historical and real-time data together with statistical algorithms and machine learning techniques to forecast future outcomes, sits at the centre of this shift. When combined with artificial intelligence, predictive analytics evolves from a reporting function into an active strategic capability, one that can be embedded directly into operational workflows and executive decision-making processes (Davenport & Harris, 2007).

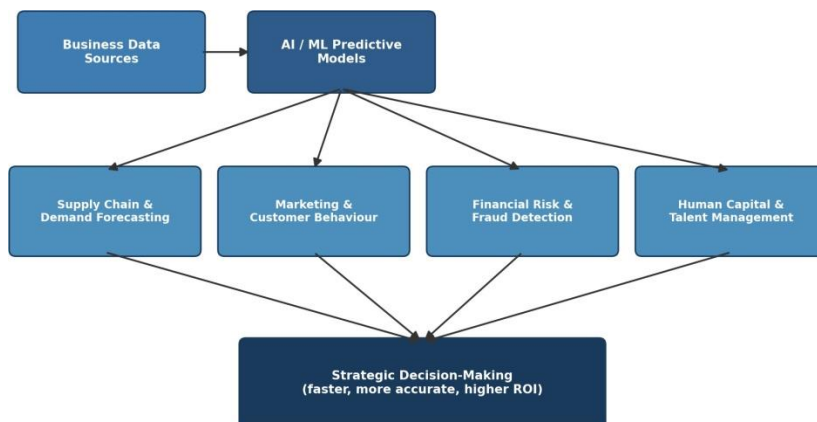


Figure 1: Flow of AI-driven predictive analytics from data sources through business-function optimisation to strategic decision-making

This paper explores how AI-driven predictive analytics is applied across core business functions to optimise performance and inform strategic decisions. It examines the underlying techniques, reviews function-specific applications, and considers the organisational and technical limitations that determine whether predictive systems translate into genuine strategic advantage.

Methodology: This paper adopts a narrative literature review approach, drawing on peer-reviewed research, industry case studies, and technical reports on the application of AI-driven predictive analytics in business contexts. The review focuses on four representative business functions where predictive analytics is most widely applied: Supply chain and demand forecasting; Marketing and customer behaviour prediction; Financial risk assessment and fraud detection; Human capital and talent management.

For each function, the paper identifies the predictive technique commonly used, the decision it supports, and the reported impact on organisational performance, before comparing AI-enhanced approaches with traditional, rule-based decision-making methods.

Discussion

Demand Forecasting and Supply Chain Optimization: AI-based forecasting models, including time-series and hybrid deep learning architectures such as CNN-LSTM networks, allow organisations to anticipate demand fluctuations, supplier risk, and logistics bottlenecks with greater precision than traditional moving-average or regression-based methods (Ramasamy & Elzubair Gasm Alsid, 2025). Industry deployments commonly cover demand forecasting, inventory optimisation, and supplier risk scoring as the first functions to be automated with predictive models, since these areas combine high data availability with direct, measurable cost impact (LeewayHertz, 2026). These models integrate multi-source data, including financial indicators, operational performance measures, and real-time market signals, enabling adaptive responses to supply chain disruptions.

Example: A manufacturer using demand-forecasting models can adjust procurement volumes weeks ahead of a predicted seasonal spike, avoiding both stockouts and excess inventory carrying costs.

Business Function	Predictive Technique	Strategic Decision Supported
Demand forecasting	Time-series models, hybrid CNN-LSTM	Inventory levels, procurement timing
Supplier risk	Classification and anomaly detection	Supplier diversification
Logistics	Route and load optimisation models	Distribution planning

Customer Behaviour Prediction and Marketing Optimization: Predictive analytics enables organisations to model customer behaviour, including churn likelihood, purchase propensity, and lifetime value, using machine learning models trained on transactional and behavioural data (Ezekiel, 2025). These predictions directly inform marketing resource allocation, personalised

targeting, and campaign timing, replacing broad-based segmentation with individualised, probability-driven strategy.

Example: A retail organisation using churn-prediction models can identify at-risk customers weeks in advance and target retention offers specifically at that segment, rather than applying blanket discounts across the customer base.

Financial Risk Assessment and Fraud Detection: In financial decision-making, predictive models are used for credit scoring, fraud detection, and cash-flow forecasting. AI-based classification models can process far larger feature sets than traditional scorecards, improving both accuracy and the speed with which risk is flagged (Confluent, 2024). This has direct strategic value in reducing exposure and informing capital allocation decisions.

Example: A lending institution using AI-based fraud scoring can flag an anomalous transaction pattern in real time, rather than discovering the loss during a periodic audit weeks later.

Human Capital and Talent Management: Predictive analytics is increasingly applied to workforce planning, including attrition prediction, recruitment targeting, and performance forecasting. However, research in this domain highlights that predictive insight alone is insufficient. Organisations must pair predictive output with responsible, ethically governed decision frameworks to avoid biased or opaque workforce decisions (Al-Naemi & Botella-Carrubi, 2026).

Example: An organisation that identifies elevated attrition risk in a specific team months in advance can intervene through targeted retention conversations, rather than absorbing the cost and disruption of unplanned turnover.

Comparison Between Traditional and AI-Enhanced Decision-Making: Traditional business analytics relies on descriptive and diagnostic reporting: understanding what happened and why, typically through static dashboards and periodic review (Provost & Fawcett, 2013). AI-enhanced predictive analytics shifts this toward anticipatory decision-making, in which models continuously update forecasts as new data arrives, allowing organisations to act before an outcome materialises rather than after. Reported gains from AI-based decision-support frameworks include improved predictive accuracy, reduced decision latency, and higher return on investment relative to traditional statistical baselines such as random forest and logistic regression models (Ramasamy & Elzubair Gasm Alsid, 2025).

Limitations and Challenges: Despite its strategic potential, AI-driven predictive analytics faces several limitations. Model performance is highly dependent on the quality, completeness, and representativeness of training data; biased or incomplete datasets can produce systematically flawed predictions (Al-Naemi & Botella-Carrubi, 2026). Many advanced models, particularly deep learning architectures, lack interpretability, which complicates their use in high-stakes strategic and regulatory contexts where decision-makers must be able to justify outcomes. Organisational readiness is a further constraint: predictive systems require cross-functional data infrastructure, skilled personnel, and executive buy-in to be embedded meaningfully into decision workflows, rather than existing as isolated technical exercises (Davenport & Harris, 2007).

Technological Advances in Predictive Business Analytics: Recent research demonstrates measurable performance gains from advanced AI architectures in business decision-support contexts. A hybrid framework combining time-series prediction, transformer-based architecture, and CNN-LSTM networks was shown to improve predictive accuracy by 11.6 percent, reduce decision latency by 23 percent, and increase return on investment by 17 percent relative to random forest and logistic regression baselines (Ramasamy & Elzubair Gasm Alsid, 2025). Such results illustrate the growing gap between legacy statistical methods and modern AI-driven decision-support systems, particularly in volatile or fast-changing business environments.

Technology	Function
Transformer-based models	Recognises time-varying and contextual associations across data streams
Hybrid CNN-LSTM networks	Combines spatial and sequential pattern recognition for forecasting
Real-time data integration	Enables adaptive learning as market conditions shift
Ensemble and classification models	Supports fraud detection and credit risk scoring

Conclusion: AI-driven predictive analytics has moved from a peripheral analytical function to a core strategic capability across business domains, including supply chain management, marketing, finance, and human capital. By enabling organisations to anticipate rather than merely react to change, these systems support faster, more accurate, and more resource-efficient decision-making. However, the strategic value of predictive analytics is not automatic: it depends on data quality, model interpretability, and the organisational capacity to integrate predictive output into genuine decision-making processes. Future research and practice should focus on improving model transparency, developing industry-specific governance frameworks, and ensuring that predictive systems augment, rather than replace, human strategic judgement.

Acknowledgement: The author would like to express sincere gratitude to the faculty of the Department of Commerce, Management and IT for the opportunity to engage with this research theme, and to the research resources that supported the development of this paper.

Conflict of Interest Statement: The author declares that there is no conflict of interest regarding the publication of this paper.

Funding Statement: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Synthetic Data: An Emerging Approach for Privacy-Preserving Artificial Intelligence

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Abstract:

The rapid development of Artificial Intelligence (AI), Machine Learning (ML), and Data Science has increased the demand for large, diverse, and high-quality datasets. However, collecting real-world data can be expensive, time-consuming, and challenging because of privacy concerns and legal restrictions. Synthetic data, defined as artificially generated information that replicates the statistical properties and structural patterns of real-world data without containing any identifiable information, has emerged as a transformative solution. Synthetic data generates artificial datasets that reproduce important characteristics and patterns of real-world data without directly representing actual individuals. Synthetic data can support AI development while reducing dependence on sensitive real-world information. It is becoming important in fields such as healthcare, banking, cybersecurity, manufacturing, autonomous vehicles, and education, where access to real data may be limited by privacy rules, cost, scarcity, or security concerns. By leveraging advanced generative frameworks, synthetic data offers an infinitely scalable method to overcome historical data limitations while comprehensively safeguarding private personal information. Synthetic datasets can support software testing, machine-learning model training, research, and data sharing while

reducing direct exposure of sensitive personal information. However, synthetic data should not automatically be assumed to be private; poorly designed generative models can retain or reveal information from the original data.

This research adopts a mixed-method approach combining experimental implementation and comparative analysis. The methodology is structured in three phases. First, a real dataset is cleaned by removing duplicates, correcting missing values, identifying sensitive fields, and defining variables relevant to the intended task. Major generation techniques such as Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), statistical models, and simulation-based methods are considered. Second, the quality of the generated synthetic data was evaluated on three key metrics: statistical fidelity, downstream utility, and privacy risk.

The study shows that synthetic data has several important advantages. It can increase access to datasets where direct sharing is restricted, allow teams to develop and test systems without exposing raw personal information, create rare cases for model training, and reduce the time and cost of collecting large datasets. It is particularly useful for testing software under unusual conditions, such as fraud events, network attacks, or medical cases that occur infrequently. Synthetic data can also improve collaboration because researchers and developers can work with shareable datasets rather than confidential records. However, synthetic data has important limitations. A model may fail to preserve complex relationships, rare events, or minority-group patterns, leading to inaccurate analysis and weaker real-world performance. It can also reproduce biases present in the original data or generation model. Poorly generated synthetic data may contain inaccurate or unrealistic patterns. Additionally, synthetic data does not automatically guarantee complete privacy, particularly if the generation process is poorly designed. Research has found that privacy, utility, and fairness must all be measured, because a dataset that looks statistically realistic may still be unsafe or unsuitable for a specific machine-learning task.

Synthetic data is not a complete replacement for real data but a powerful augmentative technology that is reshaping the AI landscape. It is a promising technology for addressing challenges related to data availability, privacy, cost, and accessibility. It offers a compelling pathway to build ethical, privacy-compliant, and scalable AI systems. Future research must focus on developing standardized quality benchmarks, improving explainability of generative models, and creating hybrid models that combine real and synthetic data.

Keywords: Artificial Intelligence, Machine Learning, Variational Autoencoders, Generation Model, Synthetic Data



AI-Based Detection of Antibiotic Resistance using Machine Learning

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Abstract:

Antimicrobial resistance (AMR) is a rising healthcare concern in which resistant variants of bacteria become ineffective to antibiotics that would have otherwise been effective in treating infections. The inappropriate and unsustainable use of antibiotics contributes significantly to the rise of antibiotic-resistant bacteria (ARB). Conventional antimicrobial susceptibility testing is crucial for identifying appropriate antibiotics for treatment; however, laboratory testing often requires considerable time and resources. Artificial Intelligence (AI) presents new opportunities for analysing large-scale clinical and microbiological data to support timely medical decision-making.

Machine learning approaches have significant potential to uncover useful patterns from large clinical and microbiological datasets and support decision-making in the context of antibiotic resistance. This study will explore the reliability, applicability, and limitations of such approaches, thereby contributing to research on AI-assisted antimicrobial stewardship and the development of responsible, data-driven strategies for addressing antimicrobial resistance.

Keywords: Artificial Intelligence; Machine Learning; Antibiotic Resistance; Antimicrobial Resistance; Clinical Decision Support; Antimicrobial Stewardship; Healthcare AI



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Invited Lecture-1

Artificial Intelligence for Transforming Social Development in India



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Educational Qualifications

- M.A.(Public Administration), University of Rajasthan in 1997
- M.A.(Political Science), University of Rajasthan in 1999
- Ph.D., University of Rajasthan in 2004

Professional Experience:

- Teaching Experience 22 years to students of M.A., B.A.
- Professor (Public Administration), Department of Political Science, Jamia Millia Islamia
- (Central University) (Ministry of Education, Govt of India), Delhi (At Present)
- Professor (Public Administration) and Head, Department of Public Administration, Rajiv Gandhi National Institute of Youth Development (Institute of National Importance) (Govt of India), Regional Centre, Sector-12, Chandigarh—160012 (since 19th March, 2023)
- Professor (Public Administration) and Head, Department of Local Governance, Rajiv Gandhi National Institute of Youth Development (Institute of National Importance) (Govt of India), Sriperumbudur, Tamil Nadu--602105 (since 1st March, 2017)
- Associate Professor (Public Administration), University of Dodoma, Tanzania, Africa since 31st July, 2011 to 30th March, 2013
- Assistant Professor (Public Administration) in St. Wilfred's Post Graduate College (Affiliated to University of Rajasthan), Jaipur (India) from July, 2001 to July, 2016
- Assistant Professor (Public Administration) in S.S.Jain Subodh P.G. (Autonomous) College, Jaipur from July, 2016 to February, 2017

Books Published:

- Works on SDG-2030: Ideas and Innovations. GEDY India, Delhi. 2020 (April). ISBN: 978-81-941873-5-6
- Selected Works of Young Social Science Researchers, Vol. II. 2020 (April). Wren & Robin International Publishers, Pune.
- Selected Works of Young Social Science Researchers, Vol. I. 2019 (November.). GEDY India, Delhi. ISBN: 978-81-941873-3-2
- Trends, Prospects and Challenges in Asian E-Governance, IGI Global (USA), 2015, ISBN:9781466695368 (International Publisher), 2015
- Emerging Issues and Prospects in African E-Government, IGI Global (USA), 2015, ISBN: 978-1-14666-6296-4 (International Publisher)
- Governometrics and Technological Innovation for Public Policy, IGI Global (USA)(co-editor), 2014, ISBN: 978-1-4666-51466 (International Publisher), 2013

Publication:

- Administrative State in Pandemic Period: Issues and Prospects in Asian Countries. 2023. Indian Journal of Public Administration. Vol. <https://doi.org/10.1177/00195561221141461>
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- The Rise of Panchayati Raj Institutions as the Third Tier in Indian Federalism: Where the Shoe Pinches. 2021. Indian Journal of Public Administration. Vol. 67, Issue 1, March, pp. 9-26. <https://doi.org/10.1177/00195561211005569>
- “Financial Status of Mega Cities in India: Emerging Issues and Challenges” in an edited book Urbanization in the Global South: Perspectives and Challenges, edited by Kala S.Sridhar and George Mavrotas, Routledge Publishers (UK), 2021
- ICT for local governance: Status, emerging issues and prospects in D. Rajasekhar (ed.). Handbook of Decentralized Governance and Development in India. 2021. pp. 217-231. Routledge: Oxon (UK)
- Inclusive Development through Municipal Governance: Issues and Prospects. 2021. Advances in Social Sciences Research Journal. Vol. 8, No.4, pp.76-83.
- E-Government in Developing Countries: Experiences from India. 2020 (July). Journal of the Social Sciences. Vol 48, No. 3, pp. 1433-1443. ISSN: 0975-8935

Abstract**Artificial Intelligence for Transforming Social Development in India****Inderjeet Singh Sodhi***Department of Political Science, Jamia Millia Islamia University (Central University), Delhi.**Corresponding Email ID: isodhi@jmi.ac.in*

Background: Artificial Intelligence is concerned with the machines to perform cognitive aspects concerned with reasoning, learning and decision-making. It has emerged as one of the information technology-enabled system which is being applied in many areas, whether rural development, education, health, language, trade, commerce and so on at the national, state/regional and local level. It is being applied for skill development, employment generation, youth development, agriculture growth and economic development. Application of artificial intelligence is more prevalent in private sectors compared to public sectors. It stands for inclusiveness for the society: social system, social development, social equality, social inclusion and social justice.

Methodology: The research methodology is based on exploratory research design where data and information have been collected from the reports of the government agencies/bodies, international/regional organizations, research institutes, articles from the journals and books.

Result and Discussion: There are number of programmes and schemes based on Artificial Intelligence for social development in India, as for example India AI Mission, Digital India which stands for sustainability, equability and equity. There are many Artificial Intelligence tools for social development in India, as for example: AIKosh (a platform to provide open datasets for rural e-governance)), Bhashini (an AI-led language translation and voice platform breaking down communication barriers across regional Indian dialects for digital and governance services), BharatGen AI (a platform which supports 22 regional languages to ensure local accessibility), Adi Vaani (an AI-enabled language platform designed to address communication barriers faced by tribal communities in remote and underserved regions).

Conclusion: National Strategy for Artificial Intelligence launched by the NITI Aayog identifies AI as a transformative tool to address India's development challenges by improving access, affordability and quality of essential services. It has given priority inclusive and socially oriented growth, particularly in underserved sectors and regions, with rural India recognized as a key focus area due to persistent service and infrastructure gaps. This 21st century belongs to India where Artificial Intelligence has been given specific attention for social development.

Keywords: Artificial Intelligence, AI Tools, Social Development, India



Invited Lecture-2

Artificial Intelligence for the Sustainable Society: Issues and Challenges in India



Dr. Chander Kanwar Palawat

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Education:

Ph.D., M.Phil. (Sociology), M.A. (Sociology), M.A. (Public Administration), MBA

Area of Interest:

Sustainable Development, IKS, Youth Studies, Environment, Social Change, Development Sociology, Urban/Rural Sociology

Experience:

- Working as Nodal Officer of the flagship scheme “Swami Vivekanand Scholarship for Academic Excellence” at Commissionerate of College Education, Govt of Rajasthan, Jaipur
- Assistant Professor (Sociology), Govt College, Bonli, Swai Madhopur, Rajasthan
- Head, Department of Social Work & Director, School of Social Sciences, Jaipur National University
- Assistant Professor (Sociology), St. Wilfred’s P.G. College (Affiliated to University of Rajasthan), Jaipur
- Online Teaching: State Government’s State Level GYANDOOT Program (appreciated with Certificate)

Membership:

- Indian Sociological Society
- Rajasthan Sociological Association

Abstract**Artificial Intelligence for the Sustainable Society: Issues and Challenges in India****Chander Kanwar Palawat***Government College, Bonli, Swai Madhopur, Rajasthan**Corresponding Email ID: ckp2011@gmail.com***Abstract:**

Artificial Intelligence may provide societal dimension of research which may be beneficial for the citizens. It has been observed that Artificial Intelligence may balance the ecosystem ultimately providing direction to the society and people living there. Artificial Intelligence facilitates voices to be heard in the society without any discrimination. It may act as a catalyst for providing opportunities to the citizens. This paper is based on descriptive research design. It is not based on empirical field study, rather the data have been collected from various reports, documents, published research works and government websites.

NITI Aayog has come out with a report “AI for Inclusive Societal Development” published in October 2025 which advocates for sustainable society. The report also stresses that technology can bridge deep social divides, ensuring that the benefits of AI reach every citizen. The findings of the study show that Artificial Intelligence is helping to maintain the Indian society, but there are some issues and questions which pose a threat to the sustainable society. Main issues and questions are: How far Artificial Intelligence may be reliable for the society as there is argument/rumour that in the future it may control the human beings, it may itself rule over the state? How far the laws/acts are relevant to properly manage the Artificial Intelligence for the smooth functioning of the society? Whether the Artificial Intelligence is moving in right direction in the Indian society? Whether it would help in removing inequality in the society? What could be the correct Artificial Intelligence tools to create trust in the society?

There is no doubt that recently there has been relevance of Artificial Intelligence in the Indian society which may help to maintain sustainability, reliability, ethics and empathy in the rubric of the social system. Artificial Intelligence, if applied rightly, may promote understanding among the citizens of India. Although, there are some issues and challenges, but if handled properly, then offcourse there may be just and equitable society in India.

Keywords: Artificial Intelligence, Society, Issues, Challenges, India



Invited Lecture-3

The Role of AI in Education: Empowering Human-Centered Learning and Knowledge Creation



Prof. Ajay Surana

Professor & Head, Department of Education, Banasthali Vidyapith, Rajasthan, India

Executive Profile:

Prof. Ajay Surana is an academic administrator, teacher educator, and curriculum expert with 27 years of university-level teaching experience. Holding postgraduate degrees in Education, Mathematics, and Economics alongside a Ph.D. in Education, his core expertise encompasses Research Methodology, Teacher Education, Educational Development, Curriculum Design, and Educational Policy (NEP 2020).

Academic Leadership & Research Contributions

- **Doctoral Mentorship:** Supervised and mentored 27 Ph.D. research scholars.
- **Publications:** Authored and co-authored over 60 research papers and book chapters; authored/edited two books.
- **Institutional Governance:** Member of the Board of Studies in Education at Kumaun University and Institute Advisory Board member at the Regional Institute of Education (RIE), NCERT, Ajmer.

National Policy & Curriculum Development (NCTE & CBSE)

- **NCTE Framework Committees:** Contributed to national curriculum development for the Integrated Teacher Education Programme (ITEP) across both Foundations of Education and Pedagogy Courses (Secondary).
- **Postgraduate & Undergraduate Reforms:** Served on national committees designing the Curriculum Framework and Syllabi for the 1-Year B.Ed. Programme and 1-Year M.Ed. Programme (Field Practice and Research).
- **CBSE & NEP 2020:** Developed the CBSE Holistic Progress Card aligned with National Education Policy (NEP) 2020 recommendations.

Major Project Management & Funding

- MHRD / PMMMNMTT Projects (Govt. of India):
- School of Education Project: Co-Coordinator for an ₹1,100 Lakh initiative strengthening teacher education.
- Faculty Development Centre (FDC): Managed implementation for an ₹900 Lakh faculty capacity-building centre.
- Centre of Excellence in Science and Mathematics Education (CESME): Associated with implementation for an ₹650 Lakh specialized education centre.
- International Erasmuss+ Projects (European Commission):
- Project Manager (Jan 2020 – Dec 2023): Managed international collaborative projects, including 21st Century Skills and AURORA.
- International Academic Delegations: Represented institutional collaborations across Brussels (Belgium), Spain, Romania, Czech Republic, China, and Nepal.

Abstract

The Role of AI in Education: Empowering Human-Centered Learning and Knowledge Creation

Ajay Surana

Professor & Head, Department of Education, Banasthali Vidyapith, Rajasthan, India

Education is fundamentally about active discovery, critical inquiry, and constructing personal understanding rather than passively absorbing static facts. The principle that knowledge is actively built by the learner through experience, visual connections, and reflective thinking. Rather than replacing human educators, Artificial Intelligence (AI) serves as a powerful catalyst that scales these constructivist principles, making modern education more personal, interactive, and human-centered.

Personalizing Learning Through Active Constructivism

Traditional education often relies on a one-size-fits-all model, where every student is expected to absorb information at the exact same pace. AI breaks this rigid structure by turning passive listeners into active participants:

Adaptive Scaffolding: AI learning systems analyze a student's unique pace and cognitive gaps in real time. They act as patient digital mentors, adjusting problem-solving steps to match each learner's specific level of understanding.

Safe, Immediate Feedback: Students can experiment, test hypotheses, and learn from mistakes without fear of judgment. Instant feedback loops enable them to refine their mental models continuously, bringing light bulb moments closer.

Enhancing Understanding Through Visual Concept Mapping: A technique that helps learners visualize relationships between different ideas so they do not get lost in isolated facts:

- **Uncovering Big-Picture Connections:** AI tools can instantly synthesize complex topics into interactive visual webs, allowing students to see how individual ideas interlock.
- **Cross-Disciplinary Thinking:** A student studying climate change can visually trace its links to economics, geography, and policy. This relational approach transforms short-term memorization into deep, long-term comprehension.

Fostering Collaborative Knowledge Creation

Generative AI shifts students from passive consumers of information to active co-creators of knowledge. Guided by Design Thinking and Project-Based Learning, learners use AI as a collaborative partner:

- **Ideation and Prototyping:** AI acts as an interactive sounding board, helping students brainstorm solutions, outline projects, or model real-world scenarios rapidly.
- **Critical Thinking over Recall:** Because AI can answer factual queries instantly, the focus of learning shifts toward asking better questions, checking sources, evaluating bias, and applying ethical judgment.

Preserving and Elevating the Human Element: Technology cannot replace human empathy, moral guidance, or emotional connection. By automating routine administrative tasks—such as basic grading and scheduling—AI frees teachers to step away from the podium. Instructors transition from traditional lecturers into mentors focused on character building, emotional intelligence, and collaborative growth.

Conclusion: Guided by constructivist pedagogy and visual mapping, AI helps education evolve past rigid, factory-style schooling. It creates a dynamic future where technology handles computation and routine tasks, leaving students and teachers free to focus on what matters most: creativity, critical inquiry, and genuine human connection.

□ □ □

Invited Lecture-4

The Changing Face of Society: How AI is Shaping Our World



Dr. Dinesh Chahal

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Research Area: Teacher Education & School Education

Educational Qualifications: Ph.D. in Education, M. Ed, M.A. History, NET (History) and NET (Education)

Academic /Administrative Experiences:

- Member University court and academic council, CUH.
- Member PG Board, CRSU Jind and member BoS, CBLU, Bhiwani.
- Former Dean International Affairs, CUH
- Member selection committees for various Public Service Commissions, Universities and various National institutions.
- Former Programme Coordinator National Service Scheme (More than 10 Years).
- Programme Coordinator Youth Red Cross (More than 12 Years).
- District Commissioner for Bharat Scouts & Guides
- More than 23 years teaching and research experience (Supervised 7 Ph. D. and 6 M. Phil.)
- Completed 3 Research Projects (Two projects on youth issues, one on school education)
- Published 55 papers in reputed National and International journals.
- Participated in more than 300 seminars/workshops/conferences as resource person in India and abroad.

Professional Affiliation:

- Working with many Ministries in different capacities: Ministry of Youth Affairs and Sports, Ministry of Education, Ministry of Defence, Ministry of Home Affairs, Ministry of Parliamentary Affairs, etc.

- Resource Person (Many Universities in India) for HRDC Centers/ NIEPA/NCERT/SCERTs/DIETs/ MMTTC /Youth Welfare and Cultural Department/Faculty Development Centers (FDCs).
- Resource Person and Motivational Speaker specially for youth in many colleges/Universities/Organizations/ Indian Red Cross Society/NSS/ NCC/NYK/BK/ BSG/MGNCRE at State & National levels.
- Lecturers/Talks in Workshops/Seminars and Training Programmes (on voluntary basis)
- Delivered more than 1000 lectures/talks in Many Prestigious Colleges, Universities and organizations in India Specially on Youth issues like:
- Youth Leadership, Youth Motivation, National Integration, Drug de-addiction, Peace, Values, Interfaith Education, Communication Skills, Vivekananda/Gandhi and Youths, Cultural Heritage, Indian Knowledge System, Women Empowerment, Environmental Awareness, Life Skills, Personality Development, Bhagwad Gita and Youths, Blood Donation, Communal Harmony, Human rights, National Education Policy (NEP-2020), Gender Issues, etc. in many states of India and abroad.
- More than 10 Motivational Programmes in many prisons for prisoners.
- Addressed many youth camps/Training programmes as resource person.
- Addressed many YRC training programmes for Vice Chancellors, Principals & volunteers as resource person.
- Conducted many Leadership training programmes for Vice Chancellors, Principals & Teachers as resource person
- Conducted many Leadership training programmes for Civil Servants/Police Officers/Army Officers/Para Military Officers etc as resource person
- Radio talks many times on social issues related to youths by All India Radio.
- Delivered more than 50 lectures on Interfaith Education, Bhagwad Gita, Gandhi and Vivekananda philosophy in India and abroad.

Social Service:

- 38 Times Blood donor.
- Organized 20 Blood Donation camps in Punjab Haryana and Chandigarh.
- Organized more than 100 Social awareness camps in Villages.
- Organized Mass level Tree plantation, Yoga Camps & Health Checkup camps in Villages.

Programme Organized:

- Organized more than 40 workshops for Youth in many Colleges and Universities in India.
- Organized more than 50 workshops for Teachers throughout India to train them in community engagement.

- Organized 4 workshops for prisoners in different prisons.

Awards and Honours:

- 3 Times State Award for Youth Red Cross Services by Hon'ble Governor Haryana (2017-18, 2018-19, 2019-20).
- State NSS Award for Best NSS Programme Officer in Haryana (2018-19)
- Many times, awarded by many social organizations and NGOs for social services.
- Many times, awarded by District administration for social services (Jind, Hisar and Mahendergarh)
- Best Youth Motivator Award by Rah Group.
- Jind Ratan Award by Kendriya Arya Yuva Parishad, Delhi.
- BOLT Award (Best Teacher) by Air India and Punjab Kesri.
- Samaj Gaurav Award for Social service by Sanghi Sooch, Hisar 2019.
- Ekalavya Award-2021 by ICERT.
- Indo-Global Education Excellence Award-2022 by ICERT at Kathmandu, Nepal.

Countries of Academic visits: United Kingdom (UK), Australia, Poland, Denmark, Sweden, Mauritius, Bangladesh, South Africa, UAE, Malaysia, Nepal, Vietnam and Singapore.

Achievements

- Prime Minister Scholarship for academic excellence
- Chief Minister Scholarship for sports excellence
- ICSSR Fellowship for Ph.D.

Abstract**The Changing Face of Society: How AI is Shaping Our World****Dinesh Chahal**

*Professor, Department of Teacher Education, School of Education, Central University of Haryana,
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Artificial Intelligence (AI) is no longer a distant futuristic concept. It has rapidly entered our daily lives, transforming how we work, learn, communicate, and solve complex global problems. Like the invention of electricity or the internet, AI is a general-purpose technology that is fundamentally altering the fabric of human society.

Transforming Key Sectors: The most visible impact of AI is in healthcare. Machine learning algorithms can analyze medical images, predict disease risks early, and accelerate the discovery of new life-saving drugs. What once took researchers years can now be accomplished in months, giving doctors better tools to save lives. In education, AI acts as a personal tutor. Adaptive learning platforms assess a student's strengths and weaknesses, offering tailored lessons that match their unique pace. This helps democratize quality education, making personalized learning accessible to millions of students worldwide while reducing administrative burdens for teachers.

The workforce is experiencing a parallel shift. AI excels at processing vast amounts of data, automating repetitive tasks, and assisting professionals in creative and analytical work. While this boosts efficiency and creates new technical industries, it also changes job requirements. The future workplace demands a shift toward human-AI collaboration, where critical thinking, emotional intelligence, and adaptable skills become essential.

Addressing Ethical Challenges

Despite its immense benefits, the rapid spread of AI raises critical social questions:

- **Algorithmic Fairness:** Because AI systems learn from historical data, they can inherit and amplify human biases. Without careful design, automated systems in hiring, banking, or governance can lead to unfair treatment.
- **Information Integrity:** Advanced generative tools make creating realistic fake content easy. Protecting truth and public trust in digital spaces requires stronger verification frameworks and media literacy.
- **Data Privacy:** As smart systems rely on constant data collection, balancing technological innovation with individual privacy rights remains a major priority for policymakers.

Artificial intelligence is neither inherently good nor bad; it is a powerful tool shaped by human intent. Maximizing its benefits requires thoughtful governance, ethical development, and inclusive policies that ensure technology serves all of humanity. As AI continues to evolve, the ultimate goal must remain clear: using smart technology to build a fairer, healthier, and more empowered global society.



Invited Lecture-5**Cyber Law, Digital Evidence and AI-Driven Criminal Justice****Prof. (Dr.) Saroj Sharma**

Affiliation: Dean-School of Law, Presidency University, Bengaluru, Karnataka
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About:

Prof. Saroj is working as academic leader with over two decades of experience in legal education, institutional governance, and higher education transformation. As Dean, School of Law at Presidency University, she is leading the design and implementation of outcome-driven academic systems aligned with global benchmarks and evolving regulatory frameworks. Beyond her current role, She bring extensive experience in academic governance across multiple institutions, having contributed as a member of Boards of Studies, Research Advisory Committees, and Academic Councils. Also served on selection committees for faculty recruitment across universities, contributing to talent identification, academic standards, and institutional capacity building. These engagements have enabled me to actively shape curriculum frameworks, research ecosystems, regulatory compliance, and institutional policy at a systemic level. Her work is anchored in curriculum innovation, accreditation and quality assurance, and the development of robust academic governance structures. She focuses on strengthening doctoral and research ecosystems while fostering interdisciplinary integration and industry relevance, ensuring that legal education remains both academically rigorous and practice-oriented.

She has consistently contributed to enhancing institutional credibility, academic standards, and stakeholder engagement through strategic leadership and policy-oriented initiatives. Her approach integrates academic depth with administrative foresight to build sustainable, future-ready institutions.

A recipient of two University Gold Medals and a National Merit Scholarship, she has supervised over ten doctoral scholars and contributed extensively to legal scholarship, including authored works with Thomson Reuters and publications in Scopus and Web of Science indexed journals. Her research spans criminal justice systems, procedural law, digital courts, and regulatory frameworks relating to emerging technologies. Beyond institutional leadership, she actively engages in faculty development, accreditation processes, academic policy implementation, and serve as a speaker at

national and international forums, as well as an expert examiner, evaluator, and competition judge. She is particularly interested in contributing to higher education policy, academic governance frameworks, and advisory roles at national and global levels.

Abstract

Cyber Law, Digital Evidence and AI-Driven Criminal Justice

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Abstract:

Criminal investigation and adjudication in India increasingly rely on digital material — call detail records, CCTV footage, social media data, device forensics, and now, outputs generated or processed by artificial intelligence tools. Yet the statutory framework governing digital evidence, principally Section 65B of the Indian Evidence Act, 1872 (now Section 63 of the Bharatiya Sakshya Adhiniyam, 2023), was designed for a comparatively simple universe of electronic records: documents stored on a computer, retrieved and certified in a fairly linear manner. That assumption no longer holds. When evidence is generated, filtered, or interpreted through AI systems — facial recognition matches, predictive analytics flagging a suspect, forensic software reconstructing deleted data, or algorithmic voice and image analysis — the line between "evidence" and "evidence produced by an opaque process" becomes difficult to draw, and the existing certification requirements were never built to answer for it.

This paper looks at three interlocking problems that arise once AI enters the evidentiary chain in criminal proceedings. The first is authenticity and integrity: courts have historically tested digital evidence for tampering and continuity of custody, but an AI system that transforms raw data into an investigative output — say, converting hours of surveillance footage into a facial-match probability score — introduces a layer of interpretation that the accused cannot meaningfully cross-examine in the way they could a human witness or a straightforward document. Second is the question of explainability: Indian evidentiary standards presume that the basis of an expert opinion can be tested and challenged, yet many AI tools used in investigation operate as proprietary black boxes, leaving neither the defence nor, often, the court itself with a clear account of how a given output was arrived at. Third is the risk of embedded bias being carried into the criminal process under the guise of technical neutrality — a concern already documented in predictive policing tools abroad, and one Indian law enforcement agencies have begun adopting with comparatively little public scrutiny of the underlying training data or error rates.

The paper analyzes the way in which Indian courts have dealt with certification and reliability criteria for electronic evidence after the Anvar P. V. judgment, and questions whether such judicial philosophy developed for static electronic records can make sense for evidentiary information

generated by dynamic adaptive AI technologies. The paper also highlights the difficulty faced by defense lawyers in this context due to the limited knowledge of technology in most lawyers, and thus effectively making the rebuttable evidentiary presumption un-rebuttable.

Instead of advocating for adoption of foreign principles as a remedy, the paper argues for a balanced approach of introducing certain domestic changes: AI-specific rules of disclosure regarding the evidentiary information, minimum documentation regarding the software used in generating such evidentiary information, and recasting of the certification criteria under Section 63 B of the BSA considering the algorithmic generation of the electronic information.

Keywords: Digital evidence; Bharatiya Sakshya Adhiniyam; Section 65B; criminal justice; algorithmic evidence; admissibility; forensic AI.



Invited Lecture-6

Artificial Intelligence in Society: Balancing, Human Agency, Constitutional Rights and Data Privacy



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About:

Prateek Kasliwal is an Advocate with over 23 years of standing at the Bar and Founder of The Law Desk. He regularly appears before the Supreme Court of India, various High Courts, Tribunals and Regulatory Authorities. Alongside an extensive litigation practice, he has contributed to legal education through teaching, curriculum development, publications and professional training.

Academic Qualifications

- LL.M. – University of Rajasthan
- Master of Business Laws (NLSIU, Bengaluru)
- LL.B. – University of Rajasthan
- B.Sc. – University of Rajasthan
- Diploma in Taxation Laws – University of Rajasthan
- PG Diploma in Media Law – NALSAR
- WIPO Academy – General Course on Intellectual Property, Geneva

Areas of Teaching & Research:

Constitutional Law, Intellectual Property Rights, Arbitration & Commercial Law, Cyber Law, Information Technology Law, Consumer Protection, Media Law, Aviation Law, White Collar, Crime and Insurance Law.

Academic Engagements:

Guest Faculty, Resource Person and Speaker at the University of Rajasthan, IIS University, JECRC University, ICFAI University, Rajasthan Police Academy, Central Detective Training, School and

the Bureau of Police Research & Development. Served as Judge in National Moot Court, Mediation and Negotiation Competitions.

Academic Contributions:

Member, Industry Advisory Board, Amity Law School; Member (Industry Expert), Faculty of Law, University of Rajasthan; Contributor to Intellectual Property curriculum at The IIS University.

Publications:

Author of 'Intellectual Property Rights', 'Online Gaming – An Amalgamation of Varied Perspectives' and 'Aviation Law Compendium'; published article in Bar & Bench on school fees during COVID-19.

Recognition:

Appeared in 141 reported judgments; appointed Amicus Curiae by the Rajasthan High Court in matters Jail, Water, Parole, Camel, Dog etc.; recognised as Leading Lawyer – Dispute Resolution (2025); The Law Desk recognised as Law Firm of the Year – Rajasthan (2024–25) by the Legal Era magazine.

Memberships:

Indian Council of Arbitration; London Court of International Arbitration; International Bar Association; Inter-Pacific Bar Association.

Abstract**Artificial Intelligence in Society: Balancing, Human Agency, Constitutional Rights and Data Privacy****Prateek Kasliwal***Corresponding Email ID: prateek@thelawdesk.org*

Abstract: Artificial Intelligence has swiftly evolved from being an emerging technology to an integral part of the day-to-day life. Its application can now be seen in every field be it education, healthcare, employment, Communication, Research, Decision Making, etc; Though AI offers countless benefits by improving efficiency, expanding access to knowledge, making research much easier, its increased usage poses a serious question on the position of human in an automated society. AI should not be idealised as a replacement for Human intelligence, skills and critical thinking. Rather, it should be utilised in such manner that humans use it as a tool to reach a much more meaningful outcome by applying their own skills, knowledge and critical thinking. The focus should therefore remain on the welfare and betterment of the society, while AI enhancing the human capabilities instead of eradicating/bypassing human agency.

The growing reliance on AI, raises serious concerns of fraud, manipulation, plagiarism and loss of critical thinking and individuality. Though there is no denial in the fact that AI can be utilised to the benefit of humans, these concerns highlight the need for effective legal and ethical regulation of AI. The relationship between AI and Constitution is much more significant, because the usage of AI must remain subjected to the Constitutional principles and human rights rather than undermining them. The increasing and unregulated usage of Artificial Intelligence can affect fundamental rights, for instance algorithmic bias affecting equality, unmonitored data collection affecting privacy, AI censoring affecting free speech, and AI assisted decision making in spheres of education, healthcare, policing and surveillance affecting life and personal liberty. AI governance must therefore recognise human beings as the primary decision makers, and ensure that technological efficiency must not have an upper hand over human dignity and autonomy. This matters even more in regards to children, because they can be more easily monitored and tracked online, because they're still growing, making these tech protections much more critical for them.

India has developed various comprehensive regulatory rules and mechanisms relevant to the digital ecosystem, like the Information Technology Act, 2000. However, the swift development of generative AI continues to create regulatory hinderance concerning transparency, accountability and responsibility for AI generated content. Data privacy forms another important dimension of AI governance. AI systems extensively collect personal data and analyse it to train their systems. To address this issue the Digital Personal Data Protection Act, 2023 along with `The Digital Personal Data Protection Rules,2025, laydown the framework governing the processing of digital personal data and aims to uphold privacy while allowing limited processing of personal information in a lawful and monitored manner. Though it provides for the particular manner in which consent has to be obtained, how a particular data can be used for training AI and what are the limitations, however the question still remains as to ho w much they are actually capable of being applied practically and how much of efficiently they can control the AI governance sphere.

We will therefore intricately examine AI through a Human Centric legal perspective, focusing on its relationship with society, constitutional rights, children and data privacy. We will argue that regulations must evolve alongside technology while ensuring, AI remains a means of empowering society rather than becoming a substitute for Human intelligence and autonomy.

Keywords: Data privacy, Artificial Intelligence, AI generated content, personal liberty, Human Centric



Invited Lecture-7

Artificial Intelligence and Law: Opportunities, Challenges and Emerging Legal Issues



Dr. Shilpa Rao Rastogi

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About:

Dr. Shilpa Rao Rastogi is a prominent academician and legal professional, currently serving as the Head of the Department for the Faculty of Law at Vivekananda Global University. With a career spanning several years, she brings a wealth of experience from both academia and the legal industry. She began her journey in teaching in 2014, where she has made significant contributions to legal education through her expertise and dedication. Additionally, her practical experience as a para legal with senior advocates and renowned legal offices has enriched her understanding of legal practice and its applications.

Dr. Rastogi's involvement in various capacities within the legal community is commendable. She has served as a tournament judge for numerous Moot Court Competitions and Alternative Dispute Resolution Competitions, where she has helped shape the skills and talents of aspiring legal professionals. Furthermore, she has chaired conferences, demonstrating her leadership and organizational capabilities in academic and professional settings.

An accomplished scholar, Dr. Rastogi has a notable portfolio of publications, including contributions to esteemed platforms such as Scopus and Web of Science. Her scholarly work reflects her commitment to advancing knowledge and understanding in the field of law, contributing to academic discourse and enhancing the reputation of her institution.

Abstract**Artificial Intelligence and Law: Opportunities, Challenges and Emerging Legal Issues****Shilpa Rao Rastogi***Vivekananda Global University, Jaipur**Corresponding Email ID: Shilpa.rastogi@vgu.ac.in***Abstract:**

Artificial Intelligence (AI) has emerged as one of the most transformative technologies of the twenty-first century, influencing almost every sector of society, including the legal system. The integration of AI into the field of law has created significant opportunities for improving the efficiency, accessibility, and accuracy of legal processes. AI-powered tools are increasingly being used for legal research, contract analysis, document review, case prediction, e-discovery, legal drafting, and dispute resolution. These applications can reduce the time and cost involved in legal work and assist lawyers, judges, researchers, and other legal professionals in handling large volumes of information.

However, the increasing use of AI also creates several complex legal and ethical challenges. Issues relating to data privacy, algorithmic bias, transparency, accountability, intellectual property rights, cybersecurity, and liability require careful consideration. AI systems may produce inaccurate or biased outcomes, particularly when they are trained on incomplete or discriminatory data. The use of AI in judicial and administrative decision-making also raises concerns regarding human oversight, procedural fairness, and the right to receive reasons for decisions. Further, determining responsibility when an AI system causes harm presents new questions concerning existing principles of legal liability.

In India, the rapid development of AI highlights the need to strengthen existing legal and regulatory mechanisms while ensuring that technological innovation remains consistent with constitutional values and fundamental rights. A balanced regulatory approach is necessary to promote innovation while protecting individuals from potential misuse of AI. Human supervision, ethical standards, transparency, and accountability should remain central to the deployment of AI in the legal sector.

This paper examines the evolving relationship between Artificial Intelligence and law, focusing on its major applications, opportunities, legal challenges, and regulatory concerns. It argues that AI should function as a supportive tool rather than a replacement for human judgment. Responsible and ethical integration of AI can contribute to a more efficient, accessible, and technologically advanced justice system while preserving the fundamental principles of fairness, equality, and rule of law.

Keywords: Artificial Intelligence, Law, Legal Technology, AI Regulation, Data Privacy, Algorithmic Bias, Legal Ethics, Access to Justice.



CONTRIBUTED PAPERS**Abstract****Artificial Intelligence for Viksit Bharat 2047****Sanjay Bundela***Department of Social Science, Biyani Girls College, Jaipur**Corresponding Email ID: drsbundela2026@gmail.com*

Background: Since 2020s, Artificial Intelligence has led to increasing connectivity, expanded computing power and data. It is expected that application of Artificial Intelligence may remove blocks/hurdles erupted during the stage of formulating/implementing development programmes. In the world, both developed and developing, Artificial Intelligence is being used for economic development, nation-building and welfare of the citizens in innovative way. There has been collaboration among the public sectors, private sectors, academic institutions, research institutions and civil society organizations (CSOs) for harnessing Artificial Intelligence so that it could be used in a better way for the citizens.

Methodology: The data and information have been collected from the government reports, international organizations, research institutes and articles in journals. It is based on descriptive research design. The paper tries to analyze AI tools and initiatives for Viksit Bharat 2047.

Result and Discussion: In India, a number of innovations, including Aadhar and UPI payment, has shown to the world how technology may enable its people to avail the services. Recently, Artificial Intelligence in India is being applied for social purpose, mainly for social protection and social welfare. It is being used for public service delivery for the benefits of the citizens, to bring equality in the society. It is increasingly being applied to improve public services, welfare programmes, health facilities and educational services. Artificial Intelligence may revolutionise the life of downtrodden class of citizens, informal workers, gig workers, women, children and poor persons, as for example: Digital ShramSetu, National Mission tool, has been proposed to empower informal workers with trust, access and skills in the era of information technology. It is being expected that artificial intelligence can stand for Viksit Bharat@2047 in a right way.

Conclusion: India, a developing country, has given emphasis on the application of artificial intelligence in many areas which stands for increasing transparency, accountability and efficiency. Artificial Intelligence may lead to inclusivity and equity in the 21st century of India which has the capacity to control the emerging issues, constraints and challenges. It is expected that application of Artificial Intelligence would accelerate India's development trajectory for Viksit Bharat 2047.

Keywords: Artificial Intelligence, Innovation, Equity, Development, Viksit Bharat 2047 +



Algorithmic Resilience and the Distributional Divide: A Mixed-Methods Economic Evaluation of Ai-Driven Climate Adaptation in Vulnerable Communities

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Background: While artificial intelligence (AI) is increasingly recognized as a transformative catalyst for sustainable development and community climate resilience, prevailing initiatives remain disproportionately techno-centric and aggregated at the macro level. Resource-constrained communities confront compounding climate shocks, market failures, and socio-economic fragmentation that conventional interventions struggle to mitigate. This study examines how localized AI technologies alter both operational adaptive capacity and net income-distributional welfare in vulnerable populations confronting interconnected environmental and economic disruptions.

Methodology: An integrated mixed-methods framework was deployed, combining microeconomic welfare theory and spatial econometrics with a comparative multi-case analysis of 12 AI-enabled community initiatives across climate-vulnerable regions. Qualitative data from semi-structured practitioner and beneficiary interviews (N = 65) were triangulated against empirical program indicators, evaluating early-warning latency, resource-allocation efficiency, and the social return on investment (SROI) across heterogeneous household wealth strata while benchmarking municipal AI subsidies against direct unconditional adaptation transfers.

Result and Discussion: The empirical findings reveal a critical efficiency-equity trade-off: while AI-powered predictive systems and localized mobile advisories improved operational hazard response latency by 31% and optimized agricultural resource allocation, market-driven deployments absent redistributive mechanisms exacerbated spatial income inequality by approximately 14% to 18%. This disparity stems primarily from data-poverty externalities, capital indivisibility, and digital infrastructure deficits. Furthermore, initiatives lacking participatory co-design and transparent data governance experienced high user attrition (up to 42%) and regressive technology capture, demonstrating that technological readiness alone does not guarantee equitable or sustained community resilience.

Conclusion: AI serves as a powerful catalyst for sustainable development only when embedded within participatory governance, local capacity building, and community-owned data frameworks. We formalize a Pigouvian public finance and regulatory framework designed to internalize algorithmic externalities, providing policymakers, technologists, and international agencies with an actionable, empirically grounded roadmap to balance technical efficiency with distributive equity in climate resilience investments.

Keywords: Artificial Intelligence, Climate Economics, Welfare Economics, Community Resilience, Distributive Justice



AI and the Transformation of Society, Culture and Human Behaviour

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Abstract:

Artificial Intelligence (AI) has emerged as one of the most influential technologies shaping contemporary society. Its rapid development is transforming education, employment, communication, culture, governance, healthcare, and everyday human behaviour. Unlike earlier technological innovations that primarily extended human physical capabilities, AI increasingly influences cognitive activities such as learning, decision-making, creativity, communication, and knowledge production. This research paper examines how AI is transforming social systems, human development, and education, with particular emphasis on its effects on society, culture, and human behaviour. The paper explores both the opportunities and challenges associated with AI, including personalized education, improved accessibility, automation, enhanced productivity, cultural production, social interaction, algorithmic bias, misinformation, privacy concerns, inequality, and changing patterns of human autonomy. A review of existing literature indicates that AI should not be understood merely as a technological innovation but as a socio-technical phenomenon whose consequences depend on how individuals, institutions, governments, and communities design and use it. The study adopts a qualitative, exploratory methodology based on secondary research and thematic analysis of academic literature and institutional reports. The paper concludes that responsible AI development requires human-centered design, ethical governance, digital literacy, inclusive education, transparency, and continuous evaluation of social consequences.

Keywords: Artificial Intelligence, Society, Culture, Human Behaviour, Education, Human Development



Intelligent Societies: AI Transforming Social Systems, Human Development and Education

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Abstract:

“The future of intelligence is not simply about creating smarter machines; it is about creating a smarter society.” Artificial Intelligence (AI) has emerged as a transformative force, reshaping social

systems, human development and education. The concept of an intelligent society extends beyond technological advancement, highlighting how AI can enhance human capabilities, improve institutions and create more responsive and inclusive systems. This paper examines the evolving relationship between AI and society, with particular emphasis on education and human development.

In education, AI is enabling personalized learning, intelligent tutoring, automated feedback, language support and greater accessibility, while transforming the role of teachers from information providers into mentors and facilitators. From a human development perspective, AI can expand access to knowledge, healthcare, employment opportunities and public services. However, these opportunities are accompanied by significant challenges, including the digital divide, algorithmic bias, privacy concerns, employment disruption and threats to human autonomy.

Drawing on the UNDP Human Development Report 2025 and UNESCO's Recommendation on the Ethics of Artificial Intelligence, this paper argues for a human-centered approach to AI governance. It emphasizes that technological progress must be accompanied by ethical responsibility, digital inclusion, transparency and human oversight. Ultimately, an intelligent society should use AI not merely to automate human activities, but to empower individuals, strengthen social institutions and promote inclusive and sustainable human development.

Keywords: Artificial Intelligence; Intelligent Society; Human Development; Education; Social Transformation; AI Ethics

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Turning Forecasts into Action: An Economic Decision Framework for Climate-Resilient Resource Allocation in India

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Background: India experiences recurring climate shocks floods in Assam and Bihar, droughts across Maharashtra and Rajasthan, cyclones along the eastern coast each causing substantial economic disruption through crop losses, displacement, and infrastructure damage. Artificial intelligence has meaningfully improved the accuracy of climate forecasting in recent years, using satellite data, weather sensors, and machine learning models to predict such events earlier and with greater precision. However, forecasting accuracy alone does not guarantee resilience. A prediction stating a high probability of flooding is only valuable if institutions can convert it into a timely, cost-effective response. At present, the link between forecast output and resource-allocation decisions is largely informal, relying on institutional judgment rather than a consistent economic logic. This gap between prediction and action forms the motivation for the present study.

Methodology: This paper adopts a conceptual, economics-based approach rather than a purely technical one. Instead of proposing a new forecasting model, it develops a decision framework that treats AI-generated forecast probabilities as an input into an economic cost comparison problem. The core method compares two figures: the expected cost of acting on a forecast (preparation, evacuation, fund disbursement) against the expected cost of not acting (potential damage if the event occurs and no measures were taken). This comparison also accounts for how effective early action is likely to be in reducing eventual losses, since preparedness rarely eliminates damage entirely. The framework is contextualized within existing Indian disaster management mechanisms, including the National Disaster Response Fund, State Disaster Response Funds, and crop insurance schemes such as PM Fasal Bima Yojana, to ensure the proposed logic is grounded in real institutional structures rather than abstract assumptions.

Result and Discussion: Applying this cost comparison logic suggests that resource allocation decisions in disaster-prone regions can be made more systematically once forecast probabilities are combined with clear estimates of potential damage and preparation costs. Rather than reacting only once a disaster has occurred, institutions would have a transparent basis for deciding when a forecast justifies early spending. This is particularly relevant in regions where both financial resources and response time are limited, as it allows decision-makers to priorities action where the potential damage avoided is highest relative to cost. The discussion also highlights key limitations: forecast inaccuracies, budget constraints across multiple competing regions, and the difficulty of estimating preparation effectiveness in advance all affect how reliably such a framework can be applied in practice.

Conclusion: This paper argues that improving AI forecasting alone is not sufficient for building climate-resilient societies; equal attention is needed on how forecasts translate into resource-allocation decisions. By proposing a simple economic framework linking prediction probability, potential damage, and preparation cost, this study aims to make disaster-response decisions more consistent and less reactive, particularly within the Indian context. Future work could extend this framework empirically, testing it against real forecast and disaster response data.

Keywords: Artificial Intelligence, Climate Resilience, Disaster Risk Management, Economic Decision-Making, Resource Allocation.

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Artificial Intelligence, Human Agency and the Making of Intelligent Society in Contemporary Milieu

Surbhi Bankolia

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Abstract: Artificial intelligence has gradually become part of the world we live in, influencing how we learn, communicate, create and make everyday decisions. As machines become better at understanding human behaviour and responding to it, they also make us question what we mean by human intelligence, choice and responsibility. This paper reads Kazuo Ishiguro's *Klara and the Sun* (2021) and Ian McEwan's *Machines Like Me* (2019) from a posthumanist perspective to explore these questions. Rather than asking whether machines can truly become human, the paper is more interested in what their presence reveals about the humans who create, use and live alongside them. Klara's careful observation of people and Adam's attempts to make moral choices bring out emotions, prejudices and contradictions that are already present in human society. Their experiences suggest that being intelligent does not necessarily mean being wise, compassionate or morally responsible. At the same time, the novels complicate the idea of human agency by showing how technological systems can influence the way people make choices and understand themselves. In this sense, AI does not simply replace human agency; it changes the relationship between choice, responsibility and control. The paper therefore suggests that the machines in these novels work less as representations of a future in which technology becomes human and more as mirrors of a society trying to understand itself. By placing artificial beings within ordinary human relationships, Ishiguro and McEwan invite us to consider a difficult possibility: perhaps the most important question raised by intelligent machines is not whether they can become like us, but what their presence makes us notice about ourselves.

Keywords: Artificial Intelligence, human agency, posthumanism, intelligent societies, AI ethics, human identity, contemporary fiction

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Artificial Intelligence for Sustainable Urban Development: A Geographical Study of Smart Cities in India

Shaifhali Vijay

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Abstract:

Artificial Intelligence (AI) is emerging as an important enabler for sustainable urban development in India. The rapid pace of urbanization has brought along with it a host of challenges including traffic congestion, pollution, water scarcity, waste generation and pressure on infrastructure. Cities can handle these issues efficiently with the help of Artificial intelligence, Geographic Information Systems (GIS), Remote Sensing and the Internet of Things (IoT). This paper deals with the geographical applications of AI in Indian smart cities especially in the fields of urban planning, transportation, environmental management, water resources, waste management and disaster management. It also highlights challenges like digital inequality, high costs, data privacy, and shortage of skilled professionals. The study concludes that standard artificial intelligence can support sustainable, resilient and inclusive urban development, when complemented with effective governance and geographical planning.

Keywords: Artificial Intelligence, Smart Cities, Sustainable Development, GIS, Urban Geography, India



AI in Mental Health Companion: The Promise and Perils of Chatbot

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Abstract: The rapid growth of artificial intelligence (AI) chatbots designed to support psychological wellbeing has been driven by a global shortage of mental health professionals and persistent barriers of cost, access and stigma. This paper reviews the psychological literature on AI mental health chatbots to evaluate their effectiveness, safety and the mechanisms underpinning both their benefits and their risks. Drawing on systematic reviews, qualitative interview studies and research on trust and social presence, the paper argues that chatbots can meaningfully extend support access and provide short-term symptom relief, largely because users regard them as sources of empathy, non-judgmental listening and low-friction self-disclosure. But these same psychological mechanisms – trust, anthropomorphism and emotional attachment – also bring risks of over-reliance, safety failures in crises, depersonalized care, and the erosion of human therapeutic

relationships. In sum, the paper concludes that the evidence at this time supports the positioning of AI chatbots as complements rather than replacements for human-delivered therapy, and identifies safety guardrails and supervision by humans as priorities for future design and research.

Keywords: AI chatbots, mental health, therapeutic alliance, trust, self-disclosure, digital mental health.



Artificial Intelligence and Women's Economic Participation in India: Opportunities, Automation and the Future of Work

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Abstract:

Artificial Intelligence (AI) is increasingly influencing economic activities, transforming the way of doing business, performing work and accessing employment opportunities. Thus, an important question arises as far as India is concerned: what will AI mean for women in the labour market?

The presence of women in the labour market in India has shown remarkable development in recent years but the economic participation of women is still determined by the occupation chosen, household chores, education, digital technologies and employment opportunities. The adoption of AI may create challenges in some occupations. Although AI can affect the spheres where the participation of women is significant, it can provide new opportunities for women through flexible employment, entrepreneurship, digitalization and increase in productivity.

This paper considers the emerging topic of relationship between Artificial Intelligence and the economic participation of women in India and discusses the issues of employment, entrepreneurship, digitalization, skills, and changes in work patterns. The research is based on the secondary data collected from the Periodic Labour Force Survey (PLFS), International Labour Organization (ILO), NITI Aayog, and World Bank. The study explores whether AI can be a way towards the economic empowerment of women or, on the contrary, if the lack of equal access to technology and skills can exacerbate the gender disparity. It can be concluded that the consequences of AI technology will depend not only on the rate of digitalization but also on the access of women to education, digitalization, relevant skills, decent work, and government policies.

Keywords: Artificial Intelligence, economic activities, women employment, entrepreneurship, digitalization



Artificial Intelligence, Global Governance and the Challenges for International Cooperation, Power Relations and Responsible AI

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Abstract:

Artificial Intelligence (AI) has become a major topic in global politics and it is no longer a specialized field of technological advancement. It affects economic competition, national security, public administration, information systems and international relations. Artificial intelligence systems can be used across borders, therefore decisions made by one state or a technology corporation can have effects on individuals and organizations elsewhere. This presents a core governance question: how can a technology that has global consequences be regulated when political authority is still mostly national?

This article explores the intersection of AI and global governance through three inter-related themes: international cooperation, changing patterns of power and responsible AI. It says AI is becoming another source of geopolitical power because computing infrastructure, semiconductors, data, investment, research institutions and qualified professionals are not fairly dispersed. At the same time, no country can address all AI related risks individually. So, the study is devoted to the dilemma of collaboration and competition.

The present work adopts a qualitative and exploratory method based on documentary and comparative research. It reviews key governance efforts, including the UN Global Digital Compact, UNESCO's Recommendation on the Ethics of Artificial Intelligence, the OECD AI Principles, the European Union AI Act and the Council of Europe Framework Convention. It also discusses algorithmic prejudice, AI-enabled information manipulation and technological inequality, and explores India's increasing role through the IndiaAI Mission and its involvement with the Global Partnership on AI. The report finds that effective AI governance needs a combination of innovation and human rights, accountability, democratic ideals, international cooperation and meaningful participation of underdeveloped countries.

Keywords: Artificial Intelligence, geopolitical power, United Nations, Accountability, Democratic ideals



Ethics, Values, and Responsible AI for Humanity: Building a Human-Centered Framework for the Future

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Abstract:

Artificial Intelligence (AI) has emerged as one of the most influential technological developments of the twenty-first century. Its applications are expanding rapidly across education, healthcare, governance, employment, communication, finance, research, industry, and everyday social life. Although AI offers significant opportunities for improving efficiency, knowledge creation, decision-making, and human well-being, its increasing influence also creates complex ethical challenges. Issues such as algorithmic bias, discrimination, privacy violations, misinformation, Lack of transparency, unequal access, technological dependency, employment disruption, intellectual property concerns, and the possibility of automated decision-making without adequate human oversight have made responsible AI an important global concern. The central question is therefore not simply what AI can do, but what AI should do and under whose values and responsibilities it should operate.

This paper examines the relationship between ethics, human values, and responsible Artificial Intelligence from a human-centered perspective. It argues that technological progress cannot be separated from principles such as human dignity, justice, equality, autonomy, accountability, transparency, privacy, inclusiveness, and social responsibility. International frameworks, including UNESCO's Recommendation on the Ethics of Artificial Intelligence, the OECD AI Principles, and the NIST AI Risk Management Framework, demonstrate the growing importance of values-based AI governance. The paper also considers the Indian context, particularly the importance of data protection, digital inclusion, responsible innovation, and public awareness. It proposes a human-centered framework based on ethical design, Accountable governance, continuous risk assessment, digital literacy, stakeholder participation, and meaningful human oversight. The paper concludes that responsible AI should not be understood merely as a technical requirement but as a social and ethical commitment to ensure that artificial intelligence remains aligned with human dignity, democratic values, justice, and the broader interests of humanity.

Keywords: Artificial Intelligence, AI Ethics, Responsible AI, Human Values, Human Rights.



Artificial Intelligence and the Future of Justice – Redefining Courts, Legal Practices and Access to Justice

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Abstract:

Artificial Intelligence (AI) is transforming the legal and justice system by creating new possibilities for efficient courts, innovative legal practices and improved access to justice. AI can support legal research, document analysis, case management, transcription, translation and virtual hearings, helping reduce administrative delays and the burden of pending cases. Legal professionals can also use AI for research, drafting, contract review and evidence analysis, allowing greater focus on advocacy and legal strategy.

At the same time, the growing use of AI raises concerns related to privacy, accuracy, bias, transparency and accountability. AI-based legal assistance can improve access to basic legal information, particularly for people facing financial, geographical or linguistic barriers. However, AI should remain a supportive tool and not replace human judgment in judicial decision-making.

The future of justice therefore depends on a balanced partnership between human intelligence and artificial intelligence. Responsible and ethical use of AI can make courts more efficient, legal practices more effective and justice more accessible while keeping fairness, accountability and human dignity at the centre.

Keywords: Artificial Intelligence, Justice, Legal Research, Access to Justice, Accountability, Responsible AI, Legal Research, Assistance, Accountability, Drafting, Responsible

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AI in Journalism: Impact on News Credibility, Journalistic Practices, and Audience Trust

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Abstract:

Artificial intelligence has become a crucial component of contemporary journalism. Its integration into the field is transforming news gathering, production, editing, and dissemination. The growing

use of generative AI tools has streamlined various journalistic tasks and accelerated workflows. While many content writers leverage AI in their work, the technology is also increasingly used for research, data analysis, headline generation, and image creation. However, the use of AI in these areas has raised questions regarding the accuracy, originality, and credibility of news.

In this paper, we examine the impact of AI on journalism and its growing adoption on trust in the news by audiences. The study aims to understand how the public perceive news that is generated or assisted by artificial intelligence, and whether they view such news as trustworthy and credible. The paper also discusses the changing role of journalists in newsrooms and the need to uphold human judgment, fact-checking, and ethical standards in the use of AI tools.

The study will employ a descriptive research approach, collecting data through questionnaires distributed to media professionals, journalism students, and news audiences. The findings aim to enhance understanding of the opportunities and challenges that AI presents in journalism. The paper contends that while AI can assist journalists and increase the efficiency of news production, human oversight, transparency, verification, and ethical responsibility remain crucial to preserving news credibility and maintaining audience trust.

Keywords: Artificial Intelligence, Journalism, Generative AI, News Credibility, Audience Trust, Journalistic Practices



Tribal Marginality, Resistance, and Community Resilience: Reimagining Subaltern Voices and Indigenous Knowledge through Mahasweta Devi in the Age of Artificial Intelligence

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Abstract:

As Artificial Intelligence increasingly becomes part of the way societies create, preserve, and share knowledge, an important question arises: whose knowledge and voices are being included in this technological future? Mahasweta Devi's writings draw attention to this long-standing struggle. In *Draupadi*, *The Hunt*, *Shishu*, and *Pterodactyl*, her narratives show that tribal communities should not be viewed only through their experiences of suffering; but also reflects important forms of resilience. This perspective becomes increasingly relevant in the age of AI. AI can create new possibilities for preserving indigenous languages, oral histories, cultural traditions, and traditions as well as for making marginalized voices heard and seen. However, technology does not automatically make knowledge more inclusive. If tribal communities remain absent from the

creation and control of digital knowledge, AI may reproduce existing inequalities by misrepresenting communities, excluding their languages, or using their knowledge without meaningful participation or consent. Technology does not automatically lead to greater inclusion. Drawing on Subaltern Studies this paper connects Mahasweta Devi's portrayal of tribal marginality and resistance with current conversations, about Artificial Intelligence, indigenous knowledge and community resilience.

Methodology: This research brings the writings of Mahasweta Devi about tribal groups into discussion with today's conversations about AI and how communities stay strong. It focuses on four stories—Draupadi, The Hunt, Shishu and Pterodactyl. These stories are looked at by qualitative approach to see how Mahasweta Devi writes about tribal people marginality and resilience. These ideas from the stories are then linked with research about artificial intelligence, the knowledge of native people being part of the digital world keeping culture safe with AI and using technology in a responsible way. The study does not say that artificial intelligence can bring back lost knowledge. Instead, it looks closely and tell ways how the most powerful tool of contemporary time, AI can help keep the original knowledge of tribal people authentic.

Result and Discussion: The analysis suggests that the resilience shown in Mahasweta Devis works can guide a community-centred approach to AI. First AI tools can help document, transcribe, translate and share surviving languages, oral histories and cultural knowledge. Second digital and AI technologies can give communities chances to record and share their own histories instead of being represented only by outside institutions. These opportunities also have another side that can perform negatively. If tribal communities are left out of decisions about collecting and using their knowledge without their legitimate consent, AI may depict wrong representations, and tarnished the dignity of tribal-marginalized community.

Conclusion: The study argues that a progressive society is not truly resilient if the voices and knowledge of marginalized communities remain excluded. Mahasweta Devi's works remind that tribal resilience is rooted in identity, indigenous knowledge, agency and resistance. In the age of AI these strengths can be supported by inclusive and community-centered technologies that preserve knowledge while keeping marginalized communities in original of their own representation. AI should not speak for the subaltern; instead, AI should create spaces in which the subaltern can speak, participate and shape the future.

Keywords: Subaltern Voices; Indigenous Knowledge; Artificial Intelligence; Community Resilience; Responsible AI

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Digital Maya and Algorithmic Bad Faith: A Shankara-Sartre Framework for Human Freedom and Education in AI-Driven Intelligent Societies

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Abstract:

Contemporary intelligent societies are increasingly mediated by artificial intelligence (AI), predictive algorithms, and automated socio-technical systems. While these technologies optimize structural efficiency and educational tracking, they introduce an unprecedented existential crisis regarding human consciousness, free will, and the authenticity of choice. This research proposal establishes a novel cross-traditional philosophical framework combining Adi Shankara's Advaita Vedanta (specifically the doctrine of Maya or cosmic illusion) and Jean-Paul Sartre's existential phenomenology (focusing on radical freedom and Bad Faith). The investigation aims to demonstrate that modern AI architectures function as a 'Digital Maya' that obscures objective socio-educational realities while facilitating 'Algorithmic Bad Faith,' wherein individuals abdicate ontological responsibility to automated agents. Ultimately, this project advocates for the integration of 'Existential Literacy' and epistemic discrimination (Viveka) into contemporary AI education frameworks to safeguard genuine human development and liberation.

Introduction and Background: The hyper-acceleration of artificial intelligence systems in the twenty-first century has fundamentally transitioned global civilization into what sociologists and technologists classify as 'Intelligent Societies.' Within these configurations, automated decision-making, machine learning optimization, and predictive analytics are no longer auxiliary external utilities; they are structural substrates that continuously actively shape social systems, direct human development tracks, and govern educational pedagogies. However, behind the facade of structural optimization lies a profound, unexamined crisis of human agency. When algorithmic architectures pre-emptively determine human preferences, engineer choices, and curate echo chambers, the foundational premise of human existence—the radical capacity for authentic, unconditioned choice—is deeply jeopardized. To interpret the ontological gravity of this automation crisis, traditional sociological or purely technical critiques remain insufficiently equipped. A deeper metaphysical and existential analytical lens is required. This proposed doctoral research brings together two seemingly irreconcilable but structurally powerful philosophical paradigms: the classical non-dualist metaphysics of Adi Shankara's Advaita Vedanta and the twentieth-century secular existentialism of Jean-Paul Sartre. Shankara teaches that the apparent multiplicity of the empirical universe and the individual ego are products of Maya (cosmic illusion), and that absolute liberation (Moksha) is achieved through the cognitive sublation of this illusion to recognize the ultimate identity of the Self (Atman) with the absolute whole (Brahman). Conversely, Sartre asserts that existence precedes essence, positing that the human being is entirely self-constituted and

'condemned to be free,' fleeing this radical responsibility via the mechanism of self-deception known as Bad Faith (*mauvaise foi*).

Statement of the Problem: The pervasive integration of AI in modern social and educational infrastructure enforces a subtle form of digital determinism. The problem manifests across three interrelated vectors. First, contemporary algorithmic curation engines (e.g., recommendation systems, social media feeds) generate personalized informational filter bubbles that function as a continuous, reality-distorting apparatus—a 'Digital Maya.' Users operate under the delusion of autonomous choice, oblivious to the fact that their parameters of volition have been engineered in advance. Second, facing the existential anxiety of total freedom and accountability in a hyper-complex world, individuals actively exploit AI agents to evade moral accountability. By delegating complex ethical, professional, and existential choices to predictive models, humans slip into an institutionalized form of self-deception—'Algorithmic Bad Faith'—blaming the automated output for failures that are fundamentally their own. Third, in automated EdTech environments, predictive profiling locks students into fixed, data-driven developmental tracks based on early performance metrics. This ossification treats the human subject as a predetermined, fixed entity (an inanimate object-in-itself, or *en-soi*), directly violating the existential truth that the human consciousness is an open, self-transcending project (*for-itself*, or *pour-soi*).

Research Objectives: This dissertation project aims to fulfill the following four primary academic objectives:

- To formulate a precise textual reconstruction of Shankara's doctrine of Maya and Adhyasa (superimposition), mapping its mechanics onto modern algorithmic curation, deepfakes, and informational filter bubbles.
- To systematically extend Sartre's ontological concept of Bad Faith into the domain of human-computer interaction, analyzing the contemporary phenomenon of algorithmic accountability evasion.
- To critically evaluate the structural impact of predictive AI models on modern educational systems and human development tracking, exposing the reduction of human transcendence to data-driven determinism.
- To design an innovative pedagogical framework centered around 'Existential Literacy' and digital discrimination (Digital Viveka), providing concrete policy alternatives for designers and educators in intelligent societies.

Research Methodology: This project employs a qualitative, textually grounded Comparative Hermeneutics and conceptual analysis methodology. It strictly avoids superficial thematic comparisons by maintaining a rigorous three-stage framework: Exposition, Comparison, and Evaluation. The primary source analysis on the Advaitic axis focuses on Shankara's *Brahmasutrabhasya* (specifically the foundational *Adhyasabhasya* dealing with superimposition) and his pedagogical text, the *Vivekacudamani*. On the existential axis, it centers on Sartre's principal ontological treatise, *Being and Nothingness* (1943), and his early phenomenological essay, *The Transcendence of the Ego* (1937). The comparative stage maps these historical concepts directly

onto empirical contemporary case studies in AI, including automated educational sorting software, generative LLMs, and social surveillance architectures, ensuring the philosophical theorems remain falsifiable and structurally applicable.

Results and Discussion: Digital Maya and the Mechanics of Filter Bubbles According to Shankara, Maya operates through two primary powers: Avarana (the power of concealment, which hides the true, unified nature of reality) and Viksepa (the power of projection, which overlays a false multiplicity onto the concealed truth). The analysis demonstrates that contemporary AI algorithms perform an identical functional operation. By capturing granular user data, predictive engines conceal the objective landscape of socio-political diversity (Avarana) while simultaneously projecting a highly customized, hyper-polarized digital reality tailored specifically to the user's pre-existing cognitive biases (Viksepa). The classic Advaitic metaphor of the 'rope and the snake' finds its modern validation in digital simulations and deepfakes: the individual interacts with an algorithmic projection (the snake) with genuine existential terror or validation, completely unaware of the objective techno-structural platform (the rope) beneath.

Algorithmic Bad Faith and the Flight from Freedom Sartre famously theorized that because there is no inherent blueprint for human nature, the absolute freedom of the human agent to construct meaning induces a paralyzing state of ontological anguish (*angoisse*). To escape this anxiety, individuals adopt Bad Faith, pretending they are inanimate objects dictated by external conditions rather than free agents. The discussion reveals that intelligent societies systematically weaponize AI to monetize this flight from freedom. When a professional relies entirely on an automated risk assessment tool, or an educator uses a standard automated grading engine, they execute a classic maneuver of Bad Faith. They attempt to transform their fluid consciousness (*pour-soi*) into a rigid mechanism without accountability (*en-soi*). AI becomes the perfect institutional alibi for the evasion of moral guilt.

Educational Transformation and Determinism In the domain of human development and EdTech tracking, algorithmic architectures impose a devastating ossification. Traditional human development relies on the radical potential for transformation—a core premise shared by Shankara's path of sudden realization and Sartre's assertion of radical freedom. However, AI educational systems utilize historical datasets to predict a student's future capabilities, effectively locking them into rigid trajectories. This project demonstrates that such tracking treats the human mind as a passive entity defined by past metrics, stripping education of its liberatory and transformative essence and reducing it to a technical assembly line designed strictly to serve market capitalization.

Path to Liberation: Existential Literacy and Digital Viveka: To counter the existential threat posed by intelligent societies, the proposal outlines a synthetic path to liberation that integrates the solutions of both thinkers. From Shankara, we extract the necessity of Viveka—the sharp, intentional practice of intellectual discrimination to differentiate between the transient, projected illusion (the digital filter bubble) and the underlying socio-ontological reality. From Sartre, we draw the demand for absolute Authenticity—the courageous reclaiming of personal accountability, ensuring that algorithmic outputs are treated strictly as heuristic tools rather than existential masters. The project synthesizes these into an educational model called Existential Literacy, which trains

future citizens of intelligent societies to maintain their free will, critique automated conditioning, and preserve cognitive sovereignty.

Conclusion: A truly intelligent society cannot be measured solely by the ubiquity and efficiency of its computing infrastructure. If technological progress results in the complete mechanization of human consciousness, it constitutes an existential regression. By bridging the seemingly divergent frameworks of Adi Shankara and Jean-Paul Sartre, this doctoral research provides a robust, highly original, and urgently needed critical philosophy for the AI era. It proves that human liberation in the age of automation requires a radical awakening from the digital illusions of Maya and a courageous rejection of algorithmic Bad Faith, ensuring that human development remains an authentic, free, and unconditioned project.

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Artificial Intelligence and Fast Fashion – A Technology-Driven Approach towards Sustainability

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Abstract:

The fast fashion industry is a major contributor to environmental degradation which continues to struggle in meeting sustainability goals. Increasing levels of textile waste and resource consumption have intensified the need for effective waste management practices. In response, fashion brands are gradually shifting towards circular economy approaches that focus on reducing waste, extending product life, and promoting reuse and recycling. Recent technological advancements present new opportunities to support this transition. Artificial Intelligence (AI) related digital tools offer practical solutions for improving efficiency and reducing waste across the fashion value chain. This study examines the role of technologies such as predictive analytics, machine learning (ML), automated sorting systems, blockchain for supply chain transparency, and augmented and virtual reality (AR/VR) in enabling circular fashion practices.

Methodology: Adopting a literature review approach, the research analyses global best practices in fast fashion where technology has been used to minimize waste and improve sustainability outcomes.

Result and Discussion: The findings suggest that AI can be effectively applied across multiple stages of the fashion lifecycle, including design, production, supply chain operations, consumer use, and post-consumer management. While previous studies discuss sustainability challenges in fast fashion, limited research examines how AI can support waste reduction across the entire fashion lifecycle.

Conclusion: This paper therefore presents a holistic review of AI in current integration, its challenges and future opportunities, and supports the transition towards a more responsible, resource-efficient, and circular fast fashion industry.

Keywords: Fast Fashion, Artificial Intelligence, Sustainability, Waste Management, Circular, Fashion.



Artificial Intelligence (AI), Creativity, and Human Intelligence

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Abstract:

Artificial intelligence (AI) has revolutionized the way individuals think, learn, perform their tasks, and create. AI is capable of generating text, pictures, music, ideas and other things using big data analysis. It has hence become a crucial component that supports human creativity and intelligence. Artificial intelligence can assist students, writers, artists, designers, and other researchers in developing ideas and completing various creative tasks through problem solving. But human creativity is very unique as it involves human emotions, experiences, imagination, culture, and values. Unlike human beings, AI cannot feel any emotion or have a life experience. AI mostly operates based on the identification of patterns within the information that it has been trained on. In this case, human judgment, critical thinking, and originality are required in applying the ideas generated by AI. With the increasing use of artificial intelligence, there are worries regarding originality, authorship, privacy, and over-reliance on technologies. To sum up, AI and human intelligence can work hand in hand effectively. While AI gives speed, information, and new possibilities, human beings bring creativity, emotions, ethical judgment, and meaning.

Keywords: Artificial Intelligence; Human Beings; Human Judgment; Emotions; Ethical Judgment



AI in Sustainable Agriculture

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Abstract:

Artificial intelligence (AI) is a vital component that increases the efficiency and sustainability of agricultural practices through analysing information related to the land, climate, crops, and water. AI can be used for crop monitoring, disease and pests detection, weather forecasting, smart irrigation systems, and optimised fertilisation. Through precision agriculture, farmers can ensure that water and other resources are used only when and where they are needed, thereby minimising waste and environmental impact. Moreover, AI can help estimate the yield of a harvest and determine the most suitable periods for sowing and reaping. Nevertheless, there are several challenges associated with the use of AI in agriculture, one of which is expensive technology,

another is a lack of expertise in the field, and limited access to it. AI can be a valuable tool in sustainable and efficient farming, as well as climate-smart agriculture. The combination of AI technology with the expertise of farmers can lead to an increase in efficiency and productivity while minimising the negative impact on the environment.

Keywords: Artificial Intelligence, Crop Monitoring, Agriculture, Farming, Environment



AI and Creativity in Social Innovation

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Abstract:

Artificial Intelligence is becoming a tool for encouraging creativity and social innovation. Social innovation is about creating ideas, new services or new solutions to solve social problems. These problems include poverty, inequality, education, healthcare and environmental issues. Artificial Intelligence can help with this work by looking at a lot of information finding what people need and helping people come up with ways to solve problems.

Tools that use Artificial Intelligence can help groups of people, researchers, students and companies find patterns come up with ideas and make choices. For example, Artificial Intelligence can help find places where people need health care or better education and can help make better solutions. It can also help with tasks by coming up with different ideas and looking at what might happen. Artificial Intelligence should help human creativity not take its place. Human feelings, real-life experience, judgment and knowing about local communities are important, for real social innovation. In the end working with Artificial Intelligence and human creativity can make new solutions improve social services and help make a fairer and more lasting society.

Keywords: Artificial Intelligence, Social Innovation, Researchers, Judgment, Social Services



AI-Driven Creativity in Arts, Design, Fashion, and Visual Culture

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Abstract:

The rapid rise of Artificial Intelligence (AI) is at present transforming contemporary creative industries, including arts, design, fashion, and the visual culture. The emergence of generative AI, machine learning, computer vision, and other technologies contribute to expanding the ways in which these fields engage in imagining, conceptualizing, producing, distributing, and interpreting creative ideas. This research explores the rising trend of AI-driven creativity and analyses how the use of intelligent technologies transforms the long-standing principles of art, originality, authorship, aesthetics, and human creative agency. The study tries to shift the paradigm from seeing AI as a mere tool or a means to an end but rather positions it as a new agent in modern cultural production.

The paper implements an exploratory qualitative research design that employs library research, professional publications, documented creative practices, and selected case studies from the domains of arts, design, fashion, and visual culture. The study applies a thematic analysis strategy to explore how artists and designers interact with AI, engage in creative experimentation, embrace novel technologies and approaches, address authorship and originality, represent and interpret culture, and respond to ethical issues. Particular attention is devoted to exploring how these professionals navigate the emerging relationships with an increasingly influential agent in cultural production. For example, artists and designers can engage AI in diverse ways, including generating ideas, imagining alternative realities, prototyping, visualizing new environments, and overcoming creative block. Similarly, in the field of fashion, AI can support designers in forecasting emerging trends, creating pattern recognition algorithms, and generating prototypes. The field of visual culture sees increasing use of AI in generating digital imagery, avatars, digital environments, algorithmic advertising, and other cultural artifacts.

The study argues that creativity supported by AI-dominated processes and products is not necessarily fully substituting human agency for AI-driven outcomes but rather opens opportunities for developing new collaborative paradigms. In such contexts, the role of creative practitioners transforms from producers of unique originals into curators, editors, interpreters, and critics of AI-suggested options. As a result, creative practice becomes increasingly relational, interactive, and dependent on the ability to combine human input and machine assistance.

At the same time, the study also tries to demonstrate that society faces numerous social, cultural, legal, and ethical challenges linked to the use of such creative practices and products. For example, there are growing concerns regarding the protection of copyright and intellectual property and the need to distinguish between works created by humans and those generated by AI. Legal scholars are also debating if and how the existing copyright law framework could govern AI-generated works and business models, including questions of ownership, authorization, and compensation. There are

also ethical concerns around using artists' works to train AI algorithms and how the use of such algorithms impacts society, culture, and creative industries.

Keywords: Artificial Intelligence, Aesthetics, Publications, Digital Environments, Intellectual Property, Humans

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Buildings a Smart, Secured and Sustainable campus: A Self - powered Wireless Network for Environmental Monitoring

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Abstract:

Traditional wired sensor network of building environmental monitoring often face challenge related to stability, cost and resilience. This paper introduces a novel concept called the Green Environmental monitoring Network (green EMN), tailored specifically for campus environments. The objective of this study is proposing a self-powered wireless network solution that utilizes strategically deployed wireless sensor nodes within buildings for environmental data collection while integrating advanced security measures and sustainable power management strategies. The green EMN utilizes wireless sensor nodes within buildings, transmitting data to gateway nodes equipped with the Embedded cooperative Hybrid Intrusion Detection System (ECHIDS) for enhanced security. Sustainable power management techniques such as energy-efficient nodes, energy harvesting and duty cycling are incorporated to ensure long - term operation. The Proposed green EMN offer significant advantage over Traditional wired networks, including scalability, cost-effectiveness, resilience and seamless integration with existing campus infrastructure. The innovative ECHIDS security system provides comprehensive threat protection against cyberattack. By promoting a secure and sustainable monitoring environment, the green EMN can greatly enhance environmental monitoring capability in campus building, fostering a healthier and more sustainable learning environments for students and facility .

Keywords: Environmental monitoring wireless sensor networks, campus buildings, self-powered network, energy harvesting duty, cycling sustainable infrastructure, data analytics, real time monitoring, Intrusion detection system, network security.

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The Rise of Artificial intelligence in E-commerce: Transforming Shopping

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Abstract:

The field of e-commerce is transforming due to the integration of artificial intelligence, offering businesses fresh possibilities to enhance customer experiences, streamline operations, and foster expansion. This article explores the transformative impact of artificial intelligence (AI) on various aspects of e-commerce, including personalized shopping experiences, intelligent chatbots and virtual assistants, predictive analytics for inventory management, dynamic pricing strategies, visual search and image recognition, fraud detection, and security measures, augmented reality and virtual try-on capabilities, voice commerce and conversational AI, and automated customer service.

By leveraging AI technologies, e-commerce businesses can deliver highly personalized recommendations, provide real-time assistance, forecast demand accurately, implement dynamic pricing, streamline supply chains, and enhance security. Additionally, innovative technologies like augmented reality, virtual try-on, and voice-enabled shopping experiences powered by AI are reshaping the way consumers discover, evaluate, and purchase products online.

AI has a lot of advantages for e-commerce businesses, such as better customer experiences, operational efficiencies, and data-driven decision-making capabilities. However, we need to consider ethical issues like data privacy, algorithmic bias, and transparency in decision-making processes to maintain consumer trust and ensure responsible AI adoption. These considerations are crucial to keep up with the rapidly evolving digital marketplace.

Keywords: E-Commerce; Artificial Intelligence; Algorithmic Bias; AI Adoption



Artificial Intelligence for Smart and Resilient Societies

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Abstract:

Cities are growing rapidly, bringing both opportunities and challenges for the people who live in them. Increasing population, traffic congestion, pollution, waste generation, pressure on natural

resources, and the growing demand for public services have made urban management more complex than ever. In this situation, Artificial Intelligence (AI) offers new possibilities for making cities more efficient, responsive, and sustainable. AI can help cities understand patterns in transportation, energy consumption, waste management, public safety, and other urban services by analysing large amounts of information. However, a truly smart city should not be defined only by the amount of technology it uses. It should also be a place where technology improves the everyday lives of citizens, supports sustainable development, and creates a healthier, safer, and more inclusive environment. This paper explores the potential of AI in making urban development smarter while keeping human needs and environmental sustainability at the centre.

The paper adopts a qualitative and conceptual approach based on a review of existing academic discussions and practical applications of Artificial Intelligence in urban environments. The study examines the ways in which AI can be incorporated into important areas of city management, including transportation, energy, waste management, water resources, environmental monitoring, public safety, and delivery of public services. Along with the potential benefits of AI, the paper considers the challenges associated with its use, particularly issues of data privacy, cybersecurity, digital inequality, transparency, employment, and the need for human involvement in important decisions. The study therefore views smart-city development from both technological and social perspectives.

The discussion shows that AI can contribute significantly to sustainable urban development when it is used according to the actual needs of communities. In transportation, AI can analyse traffic conditions and help improve routes, reduce unnecessary travel time, and support more efficient public transport. In waste management, intelligent systems can identify patterns of waste generation and improve collection practices, potentially reducing unnecessary fuel consumption and environmental damage.

AI can also support better management of electricity and water by analysing consumption patterns and identifying areas where resources are being wasted. Environmental monitoring systems can use AI to detect changes in air quality and other environmental conditions, allowing authorities to respond more quickly to emerging problems. Beyond infrastructure, AI can improve the relationship between citizens and urban institutions. AI-supported public service systems can help authorities understand citizens' needs and respond to complaints or service requirements more efficiently. During emergencies, AI can assist in analysing information and identifying areas that may require immediate attention. At the same time, the increasing use of AI in cities raises important questions about who controls urban data, how personal information is protected, and whether technological development benefits all sections of society equally. If access to digital services remains unequal, smart-city development may unintentionally increase existing social inequalities. Therefore, transparency, accountability, accessibility, and citizen participation should remain important parts of AI-based urban planning.

Artificial Intelligence can become a valuable tool for creating cities that are more efficient, environmentally responsible, and responsive to the needs of their citizens. Its contribution to sustainable urban development, however, depends on how thoughtfully it is introduced and

governed. Technology should complement human judgement rather than replace it, particularly when decisions affect people's rights, safety, and quality of life. Smart cities of the future should therefore combine technological innovation with environmental responsibility, social inclusion, and meaningful participation of citizens. A human-centred approach to AI can help ensure that urban development is not simply about creating technologically advanced cities, but about creating better cities in which people can live safely, sustainably, and with dignity.

Keywords: Artificial Intelligence; Smart Cities; Sustainable Urban Development; Urban Sustainability; Intelligent Infrastructure; Digital Transformation; Human-Centred Technology.



Climate Change, Air Pollution and Human Health: An Emerging Public Health Challenge

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Abstract:

Climate change and air pollution are closely interconnected environmental challenges that are increasingly affecting human health across the world. Rising temperatures, changing weather patterns, wildfires, and increased concentrations of atmospheric pollutants can significantly influence the occurrence and severity of respiratory, cardiovascular, and other health conditions. Vulnerable populations, including children, older adults, and individuals with existing health problems, are particularly at risk. Climate-driven changes can also increase exposure to pollutants such as particulate matter and ground-level ozone, thereby placing additional pressure on healthcare systems. The health impacts of climate change are not limited to physical illness; prolonged environmental stress and extreme weather events may also contribute to psychological and social well-being concerns. Addressing these challenges requires an integrated approach that connects environmental science, public health, healthcare systems, and community-level action. This abstract explores the relationship between climate change, air pollution, and human health, with emphasis on the need for preventive strategies, climate-resilient healthcare infrastructure, public awareness, and sustainable environmental practices. Strengthening collaboration between scientific research, healthcare professionals, policymakers, and communities can play a crucial role in reducing health risks and building a healthier and more climate-resilient future.

Keywords: Climate Change, Air Pollution, Healthcare Professionals, Policymakers, Healthier



AI and Sustainable Cities

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Abstract:

The process of rapid urbanization has caused cities all over the world to grow, bringing with it both opportunities and challenges. Because of the growing population, there is now increased traffic congestion, greater air pollution, more waste being produced, shortages of water, higher energy consumption, and climate change, which has made sustainable urban development a major global priority. Artificial Intelligence (AI) has become a powerful technology that can help cities meet these challenges by making decisions based on data and by intelligently managing urban resources. It is able to analyse huge quantities of information gathered from sensors, satellites, cameras, transportation systems, and other digital technologies in order to detect patterns and aid more efficient urban planning.

The paper reveals on the role of artificial intelligence in the development of sustainable cities, focusing on areas such as transportation, energy management, waste management, water conservation, environmental monitoring, public safety, and urban planning. Systems powered by AI are able to help improve traffic flow, cut down on unnecessary energy use, predict environmental risks, enhance waste collection, and aid in the better distribution of resources. Nevertheless, the application of AI in cities also gives rise to concerns regarding privacy, cybersecurity, digital inequality, transparency, and the responsible use of data. It therefore follows that AI should not be seen as a full solution to the problems facing cities but rather as a tool which has to be put into practice in a responsible manner. The paper maintains that by combining AI with sustainable policies, public involvement, ethical governance, and inclusive planning it is possible to produce cities that are more efficient, more resilient, more environmentally responsible, and more supportive of human well-being.

Keywords: Rapid Urbanization, Artificial Intelligence, AI, Digital Inequality, Ethical Governance



Expression through Human–AI Collaboration

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Abstract:

Generative Artificial Intelligence (GenAI) is creating new possibilities for literary production while raising questions about authorship, originality, creativity, and human agency. This paper examines AI-assisted poetry as a collaborative practice in which human intention remains central. It also connects literary practice with wider debates about technology, expression, and creative authorship. The study adopts a practice-based qualitative approach supported by reflective textual analysis. A small corpus of poems will be developed through documented interaction with an AI system. The researcher will establish themes, emotional direction, and stylistic preferences, while AI will provide suggestions concerning diction, imagery, rhythm, lineation, and structure. Suggestions will be critically selected, rejected, combined, and revised. Prompts, responses, drafts, and creative decisions will be recorded. The analysis will examine whether AI assistance expands poetic possibilities while producing challenges related to generic language, emotional imprecision, aesthetic coherence, repetition, and individual voice. Particular attention will be given to human judgement, revision, and creative agency in shaping the final poems.

The paper proposes that AI-assisted poetry should be understood as evolving human–machine creative interaction rather than as a replacement for human authorship. Transparent documentation and critical revision are essential for evaluating literary value, responsibility, and the changing practice of creative writing.

Keywords: Artificial Intelligence; Human–AI Collaboration; AI-Assisted Poetry; Creativity; Literary Expression

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Human Values in the Age of Artificial Intelligence: Towards a Humane Future

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Abstract:

Artificial Intelligence is becoming an important part of everyday human life, influencing the way we learn, communicate, work, create, and make decisions. While AI offers remarkable possibilities for human development, its rapid growth also raises questions about values that have traditionally

guided human society. This paper explores the relationship between Artificial Intelligence and human values, focusing on empathy, compassion, honesty, dignity, fairness, responsibility, and human freedom. It examines how increasing dependence on intelligent technologies may affect human relationships, creativity, independent thinking, and decision-making.

The paper argues that technological progress cannot be considered meaningful if it comes at the cost of human dignity and ethical responsibility. AI should therefore be developed and used as a means of supporting human beings rather than replacing human judgement and emotional understanding. The study also highlights the important role of education and the humanities in helping individuals engage critically and responsibly with emerging technologies. Ultimately, the paper proposes a balanced approach in which technological innovation and human values develop together. The future of AI should not be measured only by how intelligent machines become, but by how effectively technology contributes to a more just, empathetic, responsible, and humane society.

Keywords: Artificial Intelligence, Human Values, Ethics, Humanity, Human Dignity, Responsibility, Empathy, Human-Centred Technology

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Reading without an Author: Literary Interpretation in the Age of Generative AI

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Abstract: The emergence of generative AI has reopened an old question in literary studies: where does literary meaning come from? Roland Barthes challenged the authority of the author in *The Death of the Author* and shifted attention towards the reader and the plurality of meanings produced through reading. Stanley Fish later located interpretation within interpretive communities rather than within the text alone. These debates acquire a new dimension when the reader is confronted by a machine that can produce an apparently coherent interpretation without possessing a conventional authorial intention.

Recent research provides conflicting evidence about the nature of this machine reading. Ichien, Stamenković and Holyoak (2024) found that GPT-4 could produce highly rated interpretations of novel literary metaphors and poems. Other research has found that LLM performance on metaphor can be strongly influenced by lexical and structural features of language. A 2026 review of research in literary studies also identifies problems involving context, narrative structure and human evaluation.

The paper examines AI-generated readings of selected poems and short literary passages alongside established human interpretations. It focuses on metaphor, ambiguity, irony and contextual

meaning. The analysis asks whether AI produces an interpretation of the text or reconstructs patterns of interpretation already present in its training material. It also considers what happens to the reader when interpretation becomes available as an instant response rather than as a process of sustained reading.

The paper proposes that the significance of AI for literary studies lies less in the question of whether machines can “understand” literature and more in what machine-generated interpretations reveal about the nature of interpretation itself.

Keywords: Generative AI; Literary Interpretation; Machine Reading; Reader-Response Theory



The Whistleblower Paradox: Insider Alarms in Frontier AI Labs and the Crisis of State Inaction in the Global South

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Abstract:

The past few years have witnessed sharp friction between corporate promises and the private testimony of technical insiders. As major technology firms race to commercialize advanced artificial intelligence, several senior scientists and safety specialists have stepped down in protest over compromised safety protocols. Notable examples include researchers Timnit Gebru and Margaret Mitchell, who were controversially ousted from Google after detailing foundational biases and systemic harms in massive language models, as well as senior safety leaders Jan Leike and Ilya Sutskever, who resigned from OpenAI while warning that safety culture had been abandoned for commercial rollouts. Supported by collective whistleblower petitions across the industry, these departures expose how restrictive non-disclosure agreements and corporate pressure actively silence engineers from alerting external authorities about operational risks. While jurisdictions such as the European Union have introduced legally binding, risk-stratified rules, India’s governance strategy remains marked by regulatory passivity. Guided by an intent to attract foreign investment and encourage domestic tech enterprise, policymakers have maintained a strictly hands-off approach. National policy documents, notably NITI Aayog’s Responsible AI roadmaps, offer broad ethical guidance but lack statutory power, compliance audits, or punitive mechanisms. Concurrently, recent administrative interventions have stayed limited to downstream platform policing-focusing largely on rapid takedowns of deepfakes and altered media under IT intermediary rules. This approach fundamentally misdiagnoses artificial intelligence as an ordinary social media moderation problem, ignoring upstream risks embedded in model training, compute scale, and unvetted system deployment. This paper evaluates the widening divergence between internal warnings inside tech conglomerates and the complete lack of enforceable safety statutes in India. Relying on voluntary

industry self-policing leaves public infrastructure and citizens vulnerable to unverified technologies. To bridge this governance vacuum, the paper outlines a concrete legal roadmap for the Indian state: granting statutory immunity to tech whistleblowers who disclose technical hazards, mandating independent third-party safety audits before high-capacity models are deployed, and setting up an independent national regulatory body equipped with statutory powers to enforce strict corporate accountability.

Keywords: Artificial Intelligence Ethics, Tech Whistleblowers, Indian Law, Digital Governance, Public Safety, Corporate Accountability, AI Regulation

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कबड्डी खिलाड़ियों के प्रदर्शन में शारीरिक दक्षता, मानसिक एकाग्रता एवं खेल-विशिष्ट प्रशिक्षण की भूमिका: एक विश्लेषणात्मक अध्ययन

राजेंद्र सिंह शेखावत

बियानी इंस्टीट्यूट ऑफ फिजिकल एजुकेशन, कालवाड, जयपुर

सारांश:

कबड्डी भारत का एक पारंपरिक एवं लोकप्रिय टीम खेल है, जिसमें शारीरिक शक्ति, गति, चपलता, संतुलन, सहनशीलता तथा त्वरित निर्णय लेने की क्षमता का महत्वपूर्ण योगदान होता है। आधुनिक प्रतिस्पर्धात्मक कबड्डी में केवल शारीरिक क्षमता ही पर्याप्त नहीं है, बल्कि खिलाड़ी की मानसिक एकाग्रता, आत्मविश्वास, रणनीतिक सोच और परिस्थितियों के अनुरूप निर्णय लेने की क्षमता भी उसके प्रदर्शन को प्रभावित करती है। प्रस्तुत शोध का उद्देश्य कबड्डी खिलाड़ियों के खेल प्रदर्शन में शारीरिक दक्षता, मानसिक एकाग्रता तथा खेल-विशिष्ट प्रशिक्षण की भूमिका का विश्लेषण करना है। अध्ययन में गति, चपलता, विस्फोटक शक्ति, लचीलापन, सहनशक्ति तथा प्रतिक्रिया क्षमता जैसे प्रमुख शारीरिक घटकों को प्रदर्शन के संदर्भ में देखा गया है। साथ ही, प्रशिक्षण के दौरान खिलाड़ियों की एकाग्रता, तनाव-नियंत्रण और निर्णय लेने की क्षमता को भी अध्ययन का हिस्सा बनाया गया है। उपलब्ध शोध-साहित्य के विश्लेषण से यह संकेत मिलता है कि योजनाबद्ध एवं खेल-विशिष्ट प्रशिक्षण खिलाड़ियों की शारीरिक क्षमताओं और तकनीकी प्रदर्शन को बेहतर बनाने में सहायक हो सकता है। विशेष रूप से रेडिंग और डिफेंस के दौरान गति, संतुलन, शक्ति तथा त्वरित प्रतिक्रिया का समन्वय सफल प्रदर्शन के लिए आवश्यक दिखाई देता है। अतः कबड्डी प्रशिक्षण में शारीरिक अभ्यास के साथ मानसिक तैयारी और परिस्थिति-आधारित अभ्यासों को शामिल करना खिलाड़ियों के समग्र प्रदर्शन को विकसित करने की दिशा में उपयोगी हो सकता है। यह अध्ययन प्रशिक्षकों, शारीरिक शिक्षा विशेषज्ञों एवं खिलाड़ियों के लिए अधिक प्रभावी और समग्र प्रशिक्षण कार्यक्रम तैयार करने में उपयोगी आधार प्रदान कर सकता है।

मुख्य शब्द : कबड्डी, खेल प्रदर्शन, शारीरिक दक्षता, मानसिक एकाग्रता, चपलता, गति, विस्फोटक शक्ति, खेल-विशिष्ट प्रशिक्षण, सहनशक्ति, प्रतिक्रिया क्षमता।

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Artificial Intelligence and Psychological Resilience among University Students: Exploring the Role of AI Literacy, Self-Efficacy, and Adaptive Coping

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Abstract: Artificial Intelligence (AI) is rapidly transforming education, communication, decision-making, and everyday social interactions. While AI-enabled technologies provide opportunities for personalized learning, problem-solving, and psychological support, their increasing use also raises concerns related to dependency, information overload, uncertainty, reduced human interaction, and academic stress. The present study proposes to examine the relationship between AI literacy, self-efficacy, adaptive coping, and psychological resilience among university students. The study will adopt a quantitative, cross-sectional research design with university students as participants. The study may also contribute to the development of AI-literacy programmes, resilience-building interventions, and psychologically informed educational policies.

Keywords: Artificial Intelligence, AI Literacy, Psychological Resilience, Self-Efficacy, Coping, University Students, Education

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Rewriting the Human Story: Artificial Intelligence, Narrative Consciousness, and the Future of Literary Interpretation

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Abstract: Literature has functioned, across centuries, as a way for societies to hold onto memory, argue with their own values, and imagine what has not yet happened. Generative AI complicates this quietly but seriously. Today we witness how AI model can produce a poem, a short story or a piece of criticism without even living or experiencing the emotions in it. This paper is an attempt to sit with that complication rather than resolve it too quickly.

The starting point is authorship, because that is where the discomfort is sharpest. Barthes gave us the "death of the author" decades before anyone imagined a machine writing a prose. But there is a difference between decentering the author as a critical move and removing intention from the act of writing altogether. When a language model mimics a voice or a style, what exactly is left of the

concepts we have relied on; originality, sincerity, even craft? Perhaps we are still figuring out the answers.

Secondly, these models are trained on enormous amounts of existing human writing, which means their output is never neutral. It often carries biases, clichés, and blind spots which are already discussed in our literature texts. So, reading AI-generated text is basically reading the collective existing writings which are compressed, rewritten in a computerized way. This paper highlights how reading itself is changing in contemporary world. People are no longer engaging with the narrative and literary depth because the AI writing assistants, and predictive text are altering the human emotions thus it feels more superficial than real narratives. Among this whole rat race of algorithm feeds what the humans have lost is the slower and contemplative mode of reading. The reading has become frictionless and lost its human essence.

Literary culture has absorbed disruptive technologies before too in the form of print media, photography, cinema, and each time, the definition of what counts as "literary" has stretched to a new domain rather than breaking into artificial pieces. Finally, this paper argues that human emotions cannot be explained, narrated and determined by the AI assisting writing tools. Artificial Intelligence can never overpower the writing and narrative style of humans.

Keywords: Artificial Intelligence, Literary Theory, Authorship, Digital Humanities, Cultural Transformation, Narrative, Human Behavior



Reinventing Creation and Responsibility: From Frankenstein to Artificial Intelligence

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Abstract: Frankenstein: or, The Modern Prometheus (1818), Mary Shelley's Frankenstein has become the foundational Western story about artificial creation, especially in the moments when technology seems to overstep human limits. The study reexamines how the relevance of the novel to artificial intelligence has been consistently misread; thus, the study focuses on identifying Victor Frankenstein's mistake as the act of creating life itself, and also proposes his act of ignoring the more significant failure of care and responsibility that follows. Through a close reading of the creature's demand for recognition and connecting it with contemporary philosophical debates on technology, Shelley's narrative aligns with the 'responsibility gap' seen in the generative AI, where accountability is fractured across computational systems and forms of agency.

Through engagement with interdisciplinary perspectives from Latour, Jonas, Clayton, and AI critique literature, the present study argues that *Frankenstein* anticipates many of the ethical

questions raised by today's intelligent technologies and offers a useful way of thinking about responsibility in the age of artificial intelligence and proposes that ethical responsibility does not end with invention but continues throughout the life of what has been created.

Keywords: Frankenstein, Artificial Intelligence, Ethics of Responsibility, AI Governance, Digital Humanities, Philosophy of Technology



From Algorithms to Action: AI Strategies for Sustainable and Resilient Communities

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Abstract:

As climate impacts worsen and resource pressures grow, local communities are finding themselves on the front lines of global crises. This paper looks at how Artificial Intelligence can be put to work at the grassroots level—not as a top-down technology pushed by big tech, but as a practical tool for social innovation and local resilience.

By looking at real-world examples in disaster preparedness, localized clean energy, and public health, we show how smart data tools help neighborhoods and small towns make faster, better decisions. Predictive models give vulnerable communities a head start on extreme weather, while smart management tools help stretch scarce local resources further. However, technology alone isn't a silver bullet. Without careful oversight, AI can easily reinforce local inequities, misuse sensitive community data, or widen the digital divide.

We argue for a practical, community-led approach to technology: building AI tools with local residents rather than just for them, keeping software open and accessible, and giving communities' real control over their own data. When designed with fairness and local needs in mind, AI moves from being an abstract corporate tech trend to a meaningful driver of community strength and long-term sustainability.

Keywords: Artificial Intelligence, Community Resilience, Social Innovation, Local Data Control, Climate Adaptation, Ethical Tech.



The Importance of an AI-Powered Economy and Governance

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Abstract: Artificial Intelligence (AI) is increasingly becoming an important component of economic transformation and public administration. Its growing application in production, finance, education, healthcare, agriculture, and public services is changing the way economic activities are organized and how governments respond to emerging social and economic needs. An AI-powered economy can improve productivity, support innovation, reduce transaction costs, strengthen decision-making, and create new opportunities for entrepreneurship and employment. At the governance level, the ability of AI systems to process large volumes of data can support governments in developing evidence-based policies, improving public service delivery, identifying emerging risks, and allocating public resources more effectively.

This paper examines the significance of AI-driven economic transformation and its role in strengthening governance, with particular reference to the Indian economy. The study explores how AI can contribute to areas such as tax administration, financial inclusion, social welfare programmes, healthcare, education, agriculture, urban management, and public expenditure. AI-based analytical tools can enable governments to identify patterns in economic and social data and develop more targeted interventions. For businesses, the adoption of AI can enhance operational efficiency, improve forecasting, encourage innovation, and facilitate the emergence of new products, services, and business models.

Despite these opportunities, the expansion of AI also raises concerns regarding employment restructuring, unequal access to technology, data protection, algorithmic discrimination, cybersecurity, and the concentration of technological capabilities. These concerns make responsible and inclusive AI governance essential. The economic gains from AI are unlikely to be distributed evenly unless governments simultaneously invest in digital infrastructure, human capital, skill development, research and innovation, and appropriate regulatory institutions.

The paper argues that AI should be viewed not simply as a technological innovation but as an instrument of economic and institutional transformation. For India, the effective integration of AI with economic policy and governance can contribute to greater efficiency, transparency, inclusion, and sustainable development. However, achieving these outcomes requires a balanced approach that encourages technological innovation while ensuring accountability, ethical use of data, social inclusion, and protection of citizens' interests. The study concludes that a well-regulated and human-centred AI ecosystem can become an important foundation for building a more productive, resilient, and inclusive economy.

Keywords: Artificial Intelligence, AI-Powered Economy, AI Governance, Economic Transformation, Digital Economy, Public Policy, Human Capital, Inclusive Development, India, Sustainable Development



AI-Enabled Education and Human Development: A Framework for Responsible and Inclusive Intelligent Learning Societies

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Background: Artificial Intelligence (AI) is emerging as a transformative technology in education, influencing teaching practices, learning processes, assessment, knowledge creation, and human development. Generative AI and intelligent educational systems can provide personalized learning experiences, automate routine academic tasks, support adaptive instruction, and facilitate access to educational resources. Despite these opportunities, the rapid adoption of AI also presents significant challenges, including algorithmic bias, privacy concerns, academic integrity, misinformation, unequal technological access, and excessive dependence on automated systems. Existing approaches frequently emphasize technological efficiency while giving comparatively less attention to the social, ethical, and human dimensions of AI-enabled education. This study addresses this gap by examining how AI can be integrated into education through a human-centered framework that simultaneously considers learning effectiveness, inclusion, ethical responsibility, and human development.

Methodology: The study adopts a systematic conceptual analysis of AI applications in education, focusing on five interconnected dimensions: personalized learning, AI-assisted teaching, intelligent assessment, knowledge creation, and human development. The opportunities and challenges associated with these dimensions are analyzed using a human-centered and responsible-AI perspective. The analysis considers the roles of students, teachers, educational institutions, and policymakers in developing an effective AI-enabled learning ecosystem. Particular emphasis is placed on digital inclusion, AI literacy, transparency, privacy, academic integrity, critical thinking, and the preservation of meaningful human interaction. Based on the identified relationships, a conceptual framework is developed to guide the responsible adoption of AI in educational systems.

Result and Discussion: The analysis demonstrates that AI can enhance educational personalization, accessibility, continuous feedback, and evidence-based academic decision-making. AI-supported learning systems can identify individual learning requirements and recommend appropriate educational resources, while generative AI can assist learners and educators in brainstorming, content development, language learning, and knowledge synthesis. AI-enabled assessment can provide rapid feedback and assist educators in identifying learning gaps. However, these benefits are accompanied by risks that can directly influence educational quality and human development. Unequal access to AI technologies may reinforce existing educational disparities, while biased or inaccurate outputs may affect learning outcomes. Excessive reliance on AI-generated content may also reduce opportunities for independent reasoning, creativity, and critical inquiry. The findings therefore indicate that AI should function as an augmentative technology rather than a substitute for teachers and human judgment. Teacher AI literacy, institutional governance, transparent assessment

practices, data protection, and equitable digital infrastructure emerge as essential conditions for sustainable implementation.

Conclusion: AI-enabled education can contribute significantly to the development of intelligent societies when technological innovation is aligned with human capabilities and social values. The proposed human-centered framework positions AI as a complementary tool for improving learning while protecting autonomy, equity, creativity, critical thinking, and academic integrity. The study concludes that the success of AI in education should not be measured solely by automation or technological adoption, but by its capacity to improve meaningful learning and inclusive human development. Responsible governance, continuous AI literacy, teacher participation, and equitable access are therefore essential for transforming AI from a technological innovation into a socially beneficial educational resource.

Keywords: Artificial Intelligence, AI in Education, Generative AI, Human-Centered AI, Intelligent Societies

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Reimagining Human Values, Empathy and Ethical Interpretation in the Age of AI

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Abstract:

Literature has traditionally been understood as a deeply human engagement with emotion, imagination, experience, and ethical complexity. With the emergence of Generative Artificial Intelligence and computational approaches to literary analysis, machines can now summaries novels, interpret poems, identify themes, analyses characters, and generate literary texts within seconds. This technological transformation raises an important question: Can a machine truly understand literature, or can it only process its patterns? This paper explores the relationship between Artificial Intelligence and literary interpretation through the lens of ethics, human values, and responsible technological engagement.

Drawing upon concepts of reader-response theory, hermeneutics, empathy, and ethical criticism, the paper examines the limitations of machine-generated literary interpretation. While AI can identify linguistic patterns and produce coherent interpretations, literary meaning is also shaped by cultural context, lived experience, ambiguity, emotion, memory, and moral imagination. The paper argues that these dimensions cannot be reduced entirely to computational patterns. At the same time, AI can serve as a valuable interpretative companion by enabling comparative analysis, accessibility, multilingual engagement, and new forms of Digital Humanities research.

The study therefore proposes a “human-AI dialogic model of literary interpretation,” in which AI assists rather than replaces the human reader. Such an approach places human judgement, empathy, cultural sensitivity, and ethical responsibility at the centre of AI-assisted literary studies. The paper concludes that the future of literary scholarship lies not in choosing between human intelligence and artificial intelligence, but in creating a responsible dialogue between the two.

Keywords: Literature and AI, Artificial Intelligence, Literary Interpretation, Digital Humanities, Reader-Response Theory

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From AI Literacy to Ethical AI Literacy: Preparing Humanity for an Intelligent Future

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Abstract:

With the swift growth of Artificial Intelligence, AI literacy has become a crucial aspect of today's learning and career development. But, using AI tools doesn't automatically imply a sense of responsibility. The paper introduces a new concept of ethical AI literacy and suggests an approach to transitioning from traditional AI literacy, which emphasizes the technical skills and competencies required to interact with AI systems, to a more comprehensive perspective encompassing critical and ethical considerations. The study examines the essential aspects of ethical AI literacy, such as questioning AI-generated content, understanding algorithmic bias, data privacy and security, transparency, accountability, intellectual property, and responsible authorship. Special emphasis is placed on the humanities as a space of particular importance for the ethical reflection on emerging technologies. The study of literature, philosophy, language and cultural studies can help to develop frameworks for dealing with issues of identity, morality, power, empathy and human responsibility in an AI society. The paper contends that, in addition to more advanced algorithms, the future of AI will rely on users and developers who are ethically conscious and can challenge the power of technology. Finally, it suggests the need for an ethical AI literacy program as a pathway to shaping a future of AI for humanity which does not violate respect for human dignity, human autonomy, human creativity and human values.

Keywords: AI Literacy, Ethical AI Literacy, Artificial Intelligence, Ethics, Humanities, Digital Humanities, Human Dignity, Responsible Technology, Critical thinking

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AI in Education: Transforming Learning, Motivation, Engagement, and Psychological Well-being of Students

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Abstract:

Artificial Intelligence (AI) is increasingly becoming an integral part of contemporary education, influencing how students learn, communicate, access information, and engage with academic activities. The integration of AI-based tools, including intelligent tutoring systems, adaptive learning platforms, generative AI, and conversational assistants, has created new possibilities for personalized and learner-centred education. From a psychological perspective, these developments have important implications for students' motivation, cognitive engagement, academic self-efficacy, emotional experiences, and overall psychological well-being.

This paper explores the transformative role of AI in education through a psychological lens. It examines how personalized feedback, adaptive learning experiences, and immediate academic support may enhance students' motivation, autonomy, confidence, and participation in learning. At the same time, excessive dependence on AI may create concerns related to reduced cognitive effort, academic dependency, information overload, diminished interpersonal interaction, and anxiety regarding academic performance and technological change. The paper further considers the importance of maintaining human connection, emotional support, critical thinking, and responsible technology use within AI-enabled educational environments.

The discussion emphasizes that AI should function as a supportive educational resource rather than a replacement for teachers or students' own cognitive efforts. A psychologically informed approach to AI integration can help create learning environments that promote not only academic achievement but also autonomy, resilience, creativity, social connectedness, and emotional well-being. The paper concludes that the future of intelligent education requires a balanced human–AI partnership, where technological innovation is guided by psychological principles, ethical responsibility, and the broader goal of human development.

Keywords: Artificial Intelligence, Education, Student Motivation, Learning, Engagement, Psychological Well-being, Generative AI, Human–AI Interaction, Digital Learning

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The Loneliness Paradox: AI Companionship, Chatbots, and Social Connectedness in Urban India

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Abstract: The growing use of artificial intelligence (AI) chatbots and conversational partners is changing how people look for companionship, emotional aid, and social contact. This development raises a concern over a loneliness paradox: for the reason that, while AI companions can provide nonjudgmental, available, and rapid social interaction, it is possible that long-term reliance on AI-mediated companionship will also reverse people's attitudes toward their social lives as well as their engagement in real human relationships. Therefore, this study is aimed at conducting a literature review and drawing on all research on the topic of AI companionship, use of chatbots, loneliness, social connectedness, and relatedness to formulate findings applicable to students and young professionals in urban India. The paper takes into consideration the importance of different factors affecting chatbots and their use. Moreover, the papers reveal that, while AI companions can provide people with immediate emotional responses and social connection in case of feelings of loneliness, excessive reliance on AI-supported communication can lead to people socialising less with others offline, in real life. Nevertheless, the literature analysed has a significant gap in focusing on culturally distinctive specifics of its use in urban India among young people. The review identifies important gaps in current research and emphasizes the need for culturally sensitive and longitudinal investigations into whether AI companionship ultimately functions as a supplement, compensation, or substitute for human social relationships.

Keywords: Artificial Intelligence, AI Companionship, Chatbots, Loneliness, Social Connectedness, Belongingness, Human–AI Interaction, Urban India

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AI-Animated Screen to Shastra: Reimagining Indian Mythology for the Digital Generation

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Abstract:

For centuries, Indian mythology travelled from one generation to the next through the spoken word a grandmother's bedtime story, a temple mural, a Ramlila performed in the village square. Today,

that journey increasingly happens through a screen, and increasingly, that screen is powered by Artificial Intelligence. This paper looks at what gets gained and what gets risked when ancient epics are retold through AI-assisted animation for an audience that has grown up scrolling rather than listening. Taking *Mahavatar Narasimha* the first film in a planned seven-part series on Vishnu's ten avatars, and now the highest-grossing animated film in Indian history and Netflix's *Kurukshetra: The Great War of Mahabharata*, an eighteen-episode retelling of the epic war through its many warriors' eyes, as central examples, the paper asks whether these visually stunning, emotionally charged retellings are diluting our myths or simply giving them a new voice. There is something worth noticing here: young viewers who might never open the Gita are sitting through Krishna's counsel to Arjuna because the animation makes it feel urgent and alive. But this shift also comes with real questions about sacred stories being shaped by box-office logic, about nuance getting lost when a philosophical text becomes a spectacle, and about who controls how a civilization's memory gets told. The paper argues that this isn't the death of tradition but its next chapter mythology finding a new tongue to speak in and calls for teachers and scholars to engage with it thoughtfully rather than dismiss it.

Keywords: Artificial Intelligence, Indian Mythology, Animation, Cultural Transmission, Digital Storytelling, Mahavatar Narasimha, Kurukshetra



डिजिटल कला के माध्यम से पारंपरिक दृश्य आख्यानों का पुनर्परिप्रेक्ष्यीकरण: सांस्कृतिक स्मृति के प्रति एक समकालीन दृष्टिकोण

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सारांश:

डिजिटल तकनीकों के तीव्र विकास ने कलाकारों द्वारा दृश्य आख्यानों के सृजन, व्याख्या और प्रस्तुतीकरण के तरीकों में महत्वपूर्ण परिवर्तन किया है। यह शोध पारंपरिक दृश्य कला-प्रथाओं और समकालीन डिजिटल कला के बीच संबंध का अध्ययन करता है, जिसमें विशेष रूप से सांस्कृतिक स्मृति के संरक्षण और पुनर्व्याख्या पर ध्यान केंद्रित किया गया है। चित्रकला, रेखांकन, लोक-चित्रांकन, प्रतीकात्मक अभिव्यक्ति तथा आख्यानात्मक प्रस्तुतीकरण जैसी पारंपरिक कलात्मक विधाएँ सामूहिक पहचान, सामाजिक परंपराओं और ऐतिहासिक अनुभवों के महत्वपूर्ण दस्तावेज के रूप में कार्य करती हैं। हालांकि, डिजिटल माध्यमों और समकालीन दृश्य संस्कृति के बढ़ते प्रभाव के कारण इनके अर्थ, स्वरूप और दृश्यता में निरंतर परिवर्तन हो रहा है।

यह अध्ययन यह विश्लेषण करता है कि डिजिटल पेंटिंग, छवि-संपादन, प्रक्षेपण कला (Projection Art), एनीमेशन तथा इंटरैक्टिव मीडिया जैसे डिजिटल उपकरण पारंपरिक दृश्य रूपांकनों और प्रतीकों को किस प्रकार नए संदर्भों में प्रस्तुत कर सकते हैं, जबकि उनकी सांस्कृतिक महत्ता को भी बनाए रखा जा सके। इस शोध में गुणात्मक एवं अभ्यास-आधारित (Practice Based) शोध पद्धति का प्रयोग प्रस्तावित है, जिसमें दृश्य विश्लेषण, तुलनात्मक अध्ययन तथा रचनात्मक प्रयोग को सम्मिलित किया गया है।

शोध का तर्क है कि डिजिटल कला को केवल पारंपरिक कला के तकनीकी विकल्प के रूप में नहीं देखा जाना चाहिए, बल्कि इसे एक ऐसे रचनात्मक माध्यम के रूप में समझना चाहिए, जहाँ सांस्कृतिक स्मृति का पुनर्निर्माण, पुनर्व्याख्या और समकालीन दर्शकों के समक्ष पुनर्प्रस्तुतीकरण संभव हो सके। अध्ययन में प्रामाणिकता, नवाचार, सांस्कृतिक निरंतरता तथा तकनीकी हस्तक्षेप के बीच उत्पन्न होने वाले संबंधों और तनावों का भी विश्लेषण किया गया है। निष्कर्षतः, पारंपरिक दृश्य भाषाओं और डिजिटल कलात्मक प्रक्रियाओं का समन्वय नई कलात्मक अभिव्यक्तियों को जन्म दे सकता है तथा सांस्कृतिक विरासत के संरक्षण, पुनर्व्याख्या और व्यापक प्रसार में महत्वपूर्ण योगदान दे सकता है।

प्रमुख शब्द : दृश्य कला, डिजिटल कला, सांस्कृतिक स्मृति, पारंपरिक कला, समकालीन कला, दृश्य आख्यान, डिजिटल तकनीक, सांस्कृतिक विरासत, कलात्मक नवाचार, अभ्यास-आधारित शोध।



AI as a Design Assistant: Exploring Creativity, Efficiency, and Innovation in Visual Communication

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Abstract:

Artificial intelligence is reshaping visual communication, evolving from a simple automation tool into an active partner across ideation, image synthesis, layout drafting, and iterative refinement. Rather than replacing human input, generative systems increasingly serve as design assistants that work alongside creators throughout the design cycle. This paper examines how AI functions as an assistant, looking specifically at its impact on creative exploration, workflow efficiency, and stylistic innovation. We evaluate how AI helps designers rapidly generate alternatives, cut down on repetitive production tasks, speed up prototyping, and experiment with new visual forms. Alongside these advantages, we address key friction points—including concerns over originality, authorship, algorithmic bias, copyright, visual sameness, and the risk of undermining human creative agency. Current research indicates that while AI can boost novelty in specific settings, it does not inherently guarantee better overall design quality.

Furthermore, effective human-AI systems work best when they offer creators clear control, flexibility, and room for critical judgment. Ultimately, we argue that the future of visual communication lies not in replacing humans with algorithms, but in augmenting human talent with machine capabilities positioning AI strictly as a catalyst, collaborator, and co-editor.

Keywords: Artificial Intelligence, Generative AI, Design Assistant, Visual Communication, Creativity, Innovation, Design Efficiency, Human–AI Collaboration, Graphic Design.

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Identifying the Visual Depiction of Zodiac Signs and their Behavioural Traits in the Paintings of Four Major Painters of Modern and Contemporary Era

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Abstract:

Zodiac signs have long served as a symbolic system for interpreting human personality, behaviour, emotions, and their relationship with nature. Their associations with mythology, animals, celestial bodies, and psychological traits provide artists with diverse possibilities for visual exploration. The present study identifies and analyses the visual depiction of zodiac signs and their behavioural traits in the paintings of four selected modern and contemporary artists: Johfra Bosschart, Salvador Dalí, Susan Seddon Boulet, and Jake Baddeley.

The study follows a qualitative, comparative, and visual-analytical approach. Selected paintings of the four artists are examined in relation to the twelve zodiac signs and their associated behavioural, symbolic, mythological, and psychological characteristics. The analysis focuses on composition, colour, form, imagery, symbolism, animal and human representation, narrative content, and the relationship between visual motifs and zodiacal attributes. A comparative framework is used to identify similarities in the underlying characteristics of the zodiac signs and differences in their modes of visual representation.

The study reveals that the fundamental behavioural and symbolic characteristics associated with zodiac signs remain largely similar, while their visual representation varies according to the individual artistic language of each painter. Johfra Bosschart employs an illustrative and highly symbolic approach, combining mythological, spiritual, esoteric, and natural imagery. Salvador Dalí interprets zodiacal ideas through surrealism, using imaginative, dream-like, and symbolic transformations. Susan Seddon Boulet represents zodiacal concepts through expressive animal imagery, where animals become carriers of spiritual, psychological, and symbolic meanings. Jake

Baddeley, in contrast, adopts a more realistic and detailed visual treatment while retaining the symbolic associations of the signs. The comparative analysis demonstrates that similar zodiacal behaviours can be communicated through distinctly different visual strategies. Some representations are direct and illustrative, some rely primarily on symbolism, while others develop into elaborate visual narratives. Thus, the same zodiacal characteristic may be expressed through illustration, realism, surrealism, spiritual imagery, or symbolic storytelling.

The study concludes that zodiac signs operate as a flexible visual language for representing behavioural and psychological characteristics. Although the selected artists engage with similar zodiacal attributes, each transforms them through a distinctive artistic vision. The similarity therefore exists primarily in the underlying symbolic and behavioural concepts, whereas the difference emerges in their visual interpretation and method of representation. The study highlights the potential of zodiac imagery as a meaningful subject for contemporary painting and demonstrates how a shared symbolic system can generate diverse forms of visual expression.

Keywords: Zodiac Signs, Visual Representation, Behaviour, Symbolism, Contemporary Painting



Geometry and Topology: Interconnections, Structures and Applications

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Background: Geometry and topology are two fundamental branches of mathematics that provide powerful frameworks for understanding shapes, spaces, structures, and their underlying properties. While geometry primarily deals with measurements, distances, angles, curvature, and spatial relationships, topology investigates properties that remain unchanged under continuous deformations such as stretching, bending, and twisting. The interaction between these two fields has led to significant developments in modern mathematics and has provided useful tools for studying complex structures in physics, computer science, data analysis, and other scientific disciplines. This study presents an overview of the fundamental concepts of geometry and topology and emphasizes their interconnected nature.

Methodology: The study is based on a conceptual and analytical examination of important ideas from classical geometry, differential geometry, algebraic topology, and geometric topology. Fundamental concepts such as metric spaces, manifolds, curves, surfaces, continuity, connectedness, compactness, homology, and homology are considered to understand the transition from geometric descriptions to topological structures. The role of transformations and invariants is also examined to identify properties that characterize different geometric and topological spaces.

Result and Discussion: The analysis demonstrates that geometry and topology complement each other in describing mathematical spaces from different perspectives. Geometric methods provide quantitative information such as length, area, curvature, and angles, whereas topological methods focus on qualitative properties such as connectedness, holes, boundaries, and continuity. Concepts such as manifolds provide a natural connection between geometry and topology by allowing complicated spaces to be studied locally using familiar geometric structures. Topological invariants, including the Euler characteristic and homology groups, provide effective means for distinguishing spaces that may appear geometrically different but share the same topological structure. The development of differential geometry and algebraic topology has further strengthened this relationship and contributed to applications in modern theoretical physics, particularly in the study of space-time and field theories. In addition, topological ideas are increasingly useful in data analysis, network structures, image processing, and the study of complex systems.

Conclusion: Geometry and topology represent complementary approaches to understanding mathematical structures. Their interconnection provides a deeper understanding of spaces by combining geometric measurements with topological invariants and qualitative properties. The study of these fields not only enriches the foundations of mathematics but also creates opportunities for interdisciplinary applications. Continued research in geometric and topological methods is expected to contribute significantly to emerging areas involving complex structures, mathematical modeling, data science, and modern physics.

Keywords: Geometry, Topology, Manifolds, Homology, Topological Invariants

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स्मार्ट एवं लचीले समाजों के लिए कृत्रिम बुद्धिमत्ता

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सारांश :

वर्तमान डिजिटल युग में कृत्रिम बुद्धिमत्ता (Artificial Intelligence & AI) एक ऐसी उभरती हुई तकनीक है, जो समाज के विभिन्न क्षेत्रों में व्यापक परिवर्तन लाने की क्षमता रखती है। कृत्रिम बुद्धिमत्ता का उपयोग स्मार्ट, टिकाऊ, समावेशी और लचीले समाज के निर्माण में महत्वपूर्ण भूमिका निभा सकता है। मशीन लर्निंग, डीप लर्निंग, प्राकृतिक भाषा प्रसंस्करण तथा कंप्यूटर विजन जैसी तकनीकों ने डेटा के विश्लेषण, पूर्वानुमान और निर्णय लेने की प्रक्रिया को अधिक प्रभावी बनाया है। तेजी से बढ़ती जनसंख्या, जलवायु परिवर्तन, प्राकृतिक आपदाओं, संसाधनों की कमी, स्वास्थ्य संबंधी चुनौतियों तथा शहरीकरण जैसी समस्याओं के समाधान में AI महत्वपूर्ण सहयोग प्रदान कर सकता है। शिक्षा, स्वास्थ्य, कृषि,

परिवहन, पर्यावरण संरक्षण, ऊर्जा प्रबंधन तथा सार्वजनिक प्रशासन जैसे क्षेत्रों में इसका प्रभावी उपयोग समाज को अधिक सक्षम और आत्मनिर्भर बना सकता है।

प्रस्तुत अध्ययन एक वैचारिक एवं विश्लेषणात्मक अध्ययन है, जिसमें स्मार्ट एवं लचीले समाजों के निर्माण में कृत्रिम बुद्धिमत्ता की भूमिका का अध्ययन किया गया है। इसके लिए कृत्रिम बुद्धिमत्ता के विभिन्न सामाजिक एवं विकासात्मक अनुप्रयोगों से संबंधित उपलब्ध साहित्य, शोध अध्ययनों तथा तकनीकी विकास का विश्लेषण किया गया है। अध्ययन में स्मार्ट सिटी, आपदा प्रबंधन, स्वास्थ्य सेवाएँ, शिक्षा, कृषि, पर्यावरणीय निगरानी, ऊर्जा प्रबंधन तथा सार्वजनिक सेवाओं में AI के उपयोग की संभावनाओं का अध्ययन किया गया है। इसके साथ ही डेटा गोपनीयता, साइबर सुरक्षा, डिजिटल असमानता, एल्गोरिद्मिक पक्षपात, पारदर्शिता तथा AI के नैतिक उपयोग जैसी चुनौतियों को भी ध्यान में रखा गया है।

अध्ययन से स्पष्ट होता है कि कृत्रिम बुद्धिमत्ता समाज की कार्यक्षमता, निर्णय लेने की क्षमता और आपदा-प्रतिक्रिया को बेहतर बनाने में महत्वपूर्ण योगदान दे सकती है। AI आधारित पूर्वानुमान प्रणाली प्राकृतिक आपदाओं, रोगों के प्रसार, पर्यावरणीय परिवर्तनों तथा आधारभूत संरचनाओं से संबंधित संभावित जोखिमों की समय रहते पहचान करने में सहायता कर सकती है। स्मार्ट शहरों में AI का उपयोग यातायात प्रबंधन, ऊर्जा संरक्षण, कचरा प्रबंधन और सार्वजनिक सुरक्षा को अधिक प्रभावी बनाने में किया जा सकता है। स्वास्थ्य क्षेत्र में AI आधारित तकनीक रोगों की प्रारंभिक पहचान और निदान में सहायता कर सकती है। शिक्षा के क्षेत्र में व्यक्तिगत अधिगम तथा विद्यार्थियों की आवश्यकताओं के अनुरूप शिक्षण को बढ़ावा दिया जा सकता है। कृषि में मौसम, मृदा और फसल संबंधी डेटा के विश्लेषण द्वारा उत्पादन एवं संसाधन प्रबंधन को बेहतर बनाया जा सकता है। हालांकि, AI के प्रभावी उपयोग के लिए गुणवत्तापूर्ण डेटा, मजबूत डिजिटल आधारभूत संरचना, प्रशिक्षित मानव संसाधन, साइबर सुरक्षा और नैतिक शासन आवश्यक हैं।

कृत्रिम बुद्धिमत्ता स्मार्ट एवं लचीले समाजों के निर्माण के लिए एक प्रभावी साधन के रूप में कार्य कर सकती है। यह समाज में बेहतर निर्णय लेने, संसाधनों के कुशल उपयोग, जोखिमों के पूर्वानुमान, सार्वजनिक सेवाओं की गुणवत्ता तथा आपदा प्रबंधन को मजबूत करने में सहायता प्रदान करती है। हालांकि, AI का विकास और उपयोग मानव-केंद्रित, नैतिक, सुरक्षित और समावेशी होना आवश्यक है। सरकार, शैक्षणिक संस्थानों, शोधकर्ताओं, उद्योगों और समाज के बीच सहयोग द्वारा AI की क्षमता का अधिकतम उपयोग किया जा सकता है। सतत विकास और सामाजिक समानता के लक्ष्यों के साथ कृत्रिम बुद्धिमत्ता का समन्वय भविष्य के समाजों को अधिक स्मार्ट, सुरक्षित, अनुकूलनशील और लचीला बनाने में महत्वपूर्ण योगदान देगा।

मुख्य शब्द : कृत्रिम बुद्धिमत्ता, स्मार्ट समाज, लचीला समाज, सतत विकास, जिम्मेदार AI



प्रबुद्ध समाज – कृत्रिम बुद्धिमत्ता

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सारांश:

आर्टिफिशियल इंटेलिजेंस की तेजी से हो रही तरक्की आज के इंसानी समाज की नींव को नया आकार दे रही है, और सभ्यता को इन्फॉर्मेशन एज से एक “इंटेलिजेंट सोसाइटी” में बदल रही है। यह पेपर इस बात की जांच करता है कि AI इंटीग्रेशन कैसे मुख्य सोशल स्ट्रक्चर को पूरी तरह से बदल देता है, जिसमें गवर्नेंस, इकोनॉमिक फ्रेमवर्क, हेल्थकेयर, एजुकेशन और आपसी रिश्ते शामिल हैं। जिन मुख्य पहलुओं पर बात की गई है, उनमें शामिल हैं:

सामाजिक-आर्थिक परिवर्तन: दैनिक शारीरिक (मैनुअल) और संज्ञानात्मक (कॉग्निटिव) कार्यों से मानव-एआई सहयोग की ओर बदलाव, जिसके परिणामस्वरूप कार्यबल का पुनर्गठन और नए आर्थिक प्रतिमान (पैटर्न) उभरते हैं।

सार्वजनिक अवसंरचना और शासन: एल्गोरिदमिक निर्णय-प्रक्रिया के माध्यम से नागरिक प्रशासन, संसाधन आवंटन और पूर्वानुमानित सार्वजनिक सेवाओं में सुधार करना।

नैतिक और संरचनात्मक चुनौतियाँ: डिजिटल असमानता, एल्गोरिदमिक पूर्वाग्रह, डेटा गोपनीयता, निगरानी और मानव एजेंसी (स्वायत्तता) के संभावित क्षरण से जुड़ी गंभीर चिंताएँ।

समाज में पहले कभी न हुई कुशलता के मौकों और सामाजिक-आर्थिक मतभेदों के बढ़ने के खतरों, दोनों का एनालिसिस करके, यह स्टडी यह तर्क देती है कि एक टिकाऊ, बुद्धिमान समाज बनाने के लिए मजबूत नैतिक ढांचे, इंसानी-केंद्रित पॉलिसी डिजाइन और सबको साथ लेकर चलने वाले शासन की जरूरत है, ताकि यह पक्का हो सके कि तकनीकी तरक्की से समाज के सभी तबकों को फायदा हो।

मुख्य शब्द: कृत्रिम बुद्धिमत्ता, प्रबुद्ध समाज, बुद्धिमान समाज, स्वचालन कलन विधि, सामाजिक नैतिकता, सामाजिक नीतिशास्त्र

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AI-Driven Transformation of Social Systems, Human Development, and Education in Intelligent Societies

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Background: The rapid evolution of Artificial Intelligence (AI) is fundamentally reshaping human civilization, shifting traditional frameworks toward "Intelligent Societies." This paradigm shift deeply impacts vital sectors such as social systems, human development indices, and modern educational methodologies. Understanding this transformation from a geographical and structural perspective is crucial for creating resilient, smart communities that balance technological progress with human-centric values. While AI offers unprecedented capabilities to optimize public infrastructure, personalize learning, and automate complex tasks, it simultaneously introduces socio-economic vulnerabilities, shifts labor market demands, and widens digital divides across regions. This paper investigates how AI technologies can be systematically leveraged to foster inclusive human growth, equitable social development, and progressive educational models, while mitigating the systemic risks associated with digital exclusion and algorithmic bias.

Methodology: This research employs a comprehensive mixed-methods approach combining extensive literature review, geospatial case study analysis of pioneering smart cities, and qualitative expert interviews. Secondary data from global human development reports and academic databases were analyzed and synthesized to identify core trends in AI integration across social sectors. The structural impacts on education were evaluated by analyzing pilot AI implementation programs in diverse learning environments, focusing on adaptive learning platforms and automated assessment systems. Furthermore, a thematic analysis of current policy frameworks was conducted to evaluate their effectiveness in guiding ethical AI deployment. Simple, direct, and complete logical matrices were utilized to map AI inputs against specific societal outcomes, ensuring a continuous and self-explanatory research flow.

Result and Discussion: The analysis reveals that AI deployment significantly enhances data-driven decision-making in public administration, streamlining social welfare distribution and resource allocation in urban centers. In educational sectors, AI-driven adaptive learning systems demonstrate a notable increase in student engagement and personalized skill acquisition, successfully catering to diverse learning paces. However, the data also highlights severe challenges, including algorithmic biases that perpetuate social inequalities and a critical spatial skills gap in the current workforce. Discussions emphasize that without robust, human-centric ethical frameworks, technological advancement may outpace societal adaptation, exacerbating the regional digital divide. The findings suggest that the success of an intelligent society relies heavily on the co-evolution of technical infrastructure and inclusive social policies.

Conclusion: AI possesses immense transformative potential to elevate human capabilities and build highly resilient social systems. To achieve truly smart and sustainable intelligent societies,

stakeholders must prioritize ethical guidelines, equitable access to technology, and continuous educational reform. Collaborative governance involving policymakers, educators, and technologists is essential to ensure AI acts as a catalyst for holistic human development rather than a source of division. Continuous monitoring and cross-sector adaptations remain vital as these digital ecosystems evolve globally.

Keywords: Artificial Intelligence, Intelligent Societies, Human Development, Educational Transformation, Social Systems



Rasa in the Age of Artificial Intelligence: Reinterpreting Emotional Aesthetics in Amish Tripathi's Ram Chandra Series

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Background: The increasing integration of Artificial Intelligence (AI) into cultural and literary practices has generated new possibilities for examining how texts encode, communicate, and evoke human emotions. While contemporary technologies increasingly rely on computational approaches to identify patterns of language and affect, Indian aesthetic traditions offer a distinctly humanistic framework for understanding emotional experience through the concept of Rasa. Originating in Bharata Muni's *Natyashastra*, Rasa theory conceptualises aesthetic experience as emerging through the interaction of emotional determinants, manifestations, and transitory states. Amish Tripathi's *Ram Chandra Series*—*Scion of Ikshvaku*, *Sita: Warrior of Mithila*, and *Raavan: Enemy of Aryavarta*—reconstructs the mythological world of the *Ramayana* through psychologically complex and humanised characters. The present study investigates the emotional architecture of these narratives through the Rasa framework and explores how this indigenous aesthetic paradigm can be reconsidered in the contemporary context of AI-mediated literary interpretation.

Methodology: The study employs a qualitative, textual, and interpretive methodology. The three novels of the *Ram Chandra Series* constitute the primary corpus. Bharata Muni's formulation of Rasa, particularly the interrelationship of *Vibhava*, *Anubhava*, *Vyabhichari Bhava*, and *Sthayi Bhava*, is employed as the principal theoretical framework. Selected characters, narrative situations, conflicts, ethical dilemmas, and emotionally significant episodes are examined to identify the dominant and subsidiary Rasas produced within the narrative. The study further engages with the conceptual possibilities of AI-assisted literary analysis, particularly its capacity to recognise recurrent emotional patterns and textual associations. Rather than treating computational analysis as a substitute for human interpretation, the paper examines AI as a supplementary mode through which the affective dimensions of literary texts may be explored alongside traditional Indian aesthetics.

Result and Discussion: The analysis suggests that Tripathi's reinterpretation of the Ramayana generates a multilayered emotional structure in which mythological identities are closely associated with human psychological and ethical experiences. The characterisation of Rama, Sita, and Raavan facilitates the emergence of Vira, Karuna, Raudra, Bhayanaka, and Adbhuta among other aesthetic experiences. These Rasas are not presented as isolated emotional categories; rather, they emerge through conflicts involving duty, love, power, sacrifice, justice, fear, and moral choice. The humanisation of traditionally mythological figures consequently creates an affective space in which the reader engages with characters as psychologically and ethically complex individuals. From an AI-oriented perspective, such emotional configurations demonstrate the potential of computational approaches to trace recurring affective patterns within large literary corpora. However, computational recognition of emotional markers cannot fully encompass the culturally embedded and experiential dimensions of Rasa. The study therefore proposes a complementary relationship between technological analysis and humanistic interpretation.

Conclusion: The paper argues that the encounter between Rasa theory and Artificial Intelligence can open a productive interdisciplinary field for contemporary literary studies. The Ram Chandra Series demonstrates that traditional Indian aesthetic concepts remain capable of interpreting modern retellings of mythology and their complex representations of human emotion. At the same time, AI offers new analytical possibilities for examining patterns of affect and narrative emotion. The study concludes that technological approaches may extend the possibilities of literary analysis, but the experiential, cultural, and interpretive dimensions of Rasa remain fundamentally significant. Thus, integrating indigenous aesthetic knowledge with emerging AI-assisted approaches can contribute to a more culturally grounded and human-centred understanding of literature in the digital age.

Keywords: Rasa Theory, Artificial Intelligence, Literary Aesthetics, Amish Tripathi, Mythological Fiction.



Advanced Materials in Material Physics: Properties, Applications and Emerging Trends

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Background: Material physics is an important branch of condensed matter physics that focuses on understanding the relationship between the structure, physical properties, and applications of materials. The rapid development of advanced materials has created new opportunities in electronics, energy conversion, energy storage, sensors, healthcare, communication, and environmental technologies. Materials such as semiconductors, nanomaterials, superconductors, magnetic materials, two-dimensional materials, polymers, ceramics, and composite materials exhibit

unique electrical, optical, magnetic, thermal, and mechanical properties. Understanding these properties at the microscopic and nanoscale levels is essential for designing materials with improved performance and specific technological applications.

Methodology: This study presents a comprehensive overview of the fundamental concepts and recent developments in material physics. The relationship between crystal structure, bonding, defects, grain size, dimensionality, and physical properties is discussed. Different classes of advanced materials are examined on the basis of their electrical, optical, magnetic, thermal, and mechanical characteristics. Particular attention is given to nanostructured materials and two-dimensional materials because their properties can differ significantly from those of bulk materials. The role of experimental characterization techniques such as X-ray diffraction, scanning electron microscopy, transmission electron microscopy, spectroscopy, and electrical measurements is also considered for determining structural and physical properties.

Result and Discussion: The study indicates that controlling composition, crystal structure, defects, particle size, interfaces, and dimensionality can significantly modify the properties of materials. Nanomaterials demonstrate enhanced surface-area-to-volume ratios and size-dependent optical, electrical, and magnetic behaviour. Semiconductor materials are essential for modern electronic and optoelectronic devices, while magnetic materials are widely used in data storage, sensors, and spintronic applications. Superconducting materials exhibit remarkable electrical and magnetic properties and have potential applications in advanced energy and medical technologies. Two-dimensional materials have attracted considerable attention because of their exceptional electronic, optical, mechanical, and thermal properties. Composite and functional materials also provide opportunities to combine desirable properties from different material systems. These developments demonstrate the important role of material physics in addressing technological challenges and improving the efficiency and sustainability of modern devices.

Conclusion: Material physics provides a fundamental framework for understanding and engineering materials with tailored physical properties. Advances in synthesis, characterization, computational modelling, and nanoscale engineering are enabling the development of innovative materials for next-generation technologies. Continued research in advanced materials is expected to contribute significantly to renewable energy, electronics, energy storage, healthcare, environmental protection, and sustainable technological development. The integration of fundamental material physics with emerging technologies will therefore remain essential for the development of smart, efficient, and resilient societies.

Keywords: Material Physics, Nanomaterials, Semiconductors, Advanced Materials, Two-Dimensional Materials

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Artificial Intelligence, Law and Governance: Navigating the Path towards Responsible Innovation

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Abstract:

Artificial Intelligence (AI) is rapidly transforming the functioning of modern societies, institutions, markets and governments. Its increasing application in areas such as legal research, judicial decision-making, public administration, policing, healthcare, financial services, and policy formulation has created new opportunities for efficiency, accessibility and evidence-based governance. At the same time, the widespread use of AI raises significant legal and constitutional concerns relating to privacy, data protection, algorithmic bias, transparency, accountability, discrimination, intellectual property, cybersecurity, and the protection of fundamental rights. The growing ability of AI systems to make or influence decisions traditionally undertaken by human authorities also challenges established concepts of legal responsibility and administrative accountability.

This article examines the future of law and governance in the age of Artificial Intelligence, with particular emphasis on the need to balance technological innovation with the principles of the rule of law, constitutionalism, human dignity, equality, and justice. It analyses the changing role of lawyers, courts, legislators, and governmental institutions in responding to AI-driven technologies. The article further considers the emerging regulatory approaches to AI at the national and international levels and examines the need for a comprehensive, risk-based, human-centric legal framework for responsible AI governance.

The study argues that the future of AI governance should not be limited to regulating technology after harm occurs; rather, it should incorporate principles of transparency, explainability, accountability, fairness, human oversight, and responsible innovation from the design stage itself. In the Indian context, the article highlights the importance of developing an appropriate legal and institutional framework capable of addressing the unique challenges posed by AI while promoting technological development and inclusive governance. It concludes that the future relationship between law and AI must be founded on a collaborative model in which technology supports, rather than replaces, human judgment and democratic institutions. Effective AI governance will therefore require continuous legal adaptation, interdisciplinary cooperation, institutional capacity-building, and a strong commitment to constitutional values.

Keywords: Artificial Intelligence, Law and Governance, AI Regulation, Rule of Law, Algorithmic Accountability, Data Protection, Fundamental Rights, Responsible AI.



Artificial Intelligence, Literature and the Making of Smart and Resilient Societies: Reimagining the Role of Humanities

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Abstract:

Artificial Intelligence (AI) has emerged as one of the most influential forces shaping contemporary society, transforming not only technological and economic systems but also the ways in which human beings communicate, create, learn, interpret, and understand the world. While discussions surrounding AI often emphasise innovation, automation, and efficiency, its implications for the humanities and, particularly, English Literature deserve equally serious consideration. The study of human emotions, ethical dilemmas, identity, relationships, conflict, and social change have traditionally been explored in literature. As societies negotiate the connection between human creativity and machine intelligence, these humanistic issues take on a new significance in the age of AI. The contribution that literary studies and AI can make to the creation of "smart and resilient societies" is the subject of this paper. It examines how AI-supported tools can enrich the teaching, interpretation, and dissemination of literature through digital humanities, text analysis, personalised learning, corpus studies, and interactive pedagogical practices. At the same time, the paper critically considers the challenges posed by AI-generated texts, questions of authorship and originality, algorithmic bias, intellectual property, misinformation, and the possible erosion of critical and creative thinking. The paper proposes a complementary model in which technological innovation is guided by humanistic values rather than viewing AI as a replacement for human intellectual and creative capacities. Particular attention is given to the role of English Literature educators in developing critical AI literacy, ethical awareness, empathy, creativity, and interpretative abilities among learners. Literary texts can encourage students to question technological power, examine changing notions of humanity, and reflect on issues of identity, responsibility, freedom, and social justice. The paper argues that resilient societies require not merely technologically competent citizens but also individuals capable of critical reflection, ethical judgement, emotional intelligence, and meaningful human connection. An important ethical and cultural framework for working with AI can be found in English Literature and the humanities in general. The paper concludes that the future of intelligent societies should not be defined by machines alone; rather, it should emerge from a meaningful dialogue between artificial intelligence and human imagination, ensuring that technological progress remains inclusive, ethical, creative, and fundamentally human.

Keywords: Critical AI Literacy, Human Creativity, Smart Societies, Resilient Societies, Artificial Intelligence, English Literature, Digital Humanities, Literary Studies

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Expression through Human–AI Collaboration

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Abstract:

Generative Artificial Intelligence (GenAI) is creating new possibilities for literary production while raising questions about authorship, originality, creativity, and human agency. This paper examines AI-assisted poetry as a collaborative practice in which human intention remains central. It also connects literary practice with wider debates about technology, expression, and creative authorship. The study adopts a practice-based qualitative approach supported by reflective textual analysis. A small corpus of poems will be developed through documented interaction with an AI system. The researcher will establish themes, emotional direction, and stylistic preferences, while AI will provide suggestions concerning diction, imagery, rhythm, lineation, and structure. Suggestions will be critically selected, rejected, combined, and revised. Prompts, responses, drafts, and creative decisions will be recorded. The analysis will examine whether AI assistance expands poetic possibilities while producing challenges related to generic language, emotional imprecision, aesthetic coherence, repetition, and individual voice. Particular attention will be given to human judgement, revision, and creative agency in shaping the final poems. The paper proposes that AI-assisted poetry should be understood as evolving human–machine creative interaction rather than as a replacement for human authorship. Transparent documentation and critical revision are essential for evaluating literary value, responsibility, and the changing practice of creative writing.

Keywords: Artificial Intelligence; Human–AI Collaboration; AI-Assisted Poetry; Creativity; Literary Expression

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Human Values in the Age of Artificial Intelligence: Towards a Humane Future

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Abstract:

Artificial Intelligence is becoming an important part of everyday human life, influencing the way we learn, communicate, work, create, and make decisions. While AI offers remarkable possibilities for human development, its rapid growth also raises questions about values that have traditionally

guided human society. This paper explores the relationship between Artificial Intelligence and human values, focusing on empathy, compassion, honesty, dignity, fairness, responsibility, and human freedom. It examines how increasing dependence on intelligent technologies may affect human relationships, creativity, independent thinking, and decision-making. The paper argues that technological progress cannot be considered meaningful if it comes at the cost of human dignity and ethical responsibility. AI should therefore be developed and used as a means of supporting human beings rather than replacing human judgement and emotional understanding. The study also highlights the important role of education and the humanities in helping individuals engage critically and responsibly with emerging technologies. Ultimately, the paper proposes a balanced approach in which technological innovation and human values develop together. The future of AI should not be measured only by how intelligent machines become, but by how effectively technology contributes to a more just, empathetic, responsible, and humane society.

Keywords: Artificial Intelligence, Human Values, Ethics, Humanity, Human Dignity, Responsibility, Empathy, Human-Centred Technology

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A Psychological Review of AI-Assisted Coping, Self-Regulation, and Mental Well-Being

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Abstract:

The rapid integration of Artificial Intelligence (AI) into everyday life is changing how individuals access information, solve problems, manage emotions, cope with stress, and seek psychological support. From a psychological perspective, the present review asks whether interaction with AI can strengthen the processes that help individuals adapt to adversity, or whether excessive reliance on AI might weaken these capacities. It examines the emerging literature on AI-assisted coping, self-regulation, psychological resilience, and mental well-being. It focuses on how AI-based systems may support cognitive reappraisal, emotional expression, problem-solving, self-monitoring, goal regulation, and access to psychoeducational resources. These functions may support adaptive coping by increasing perceived control, self-efficacy, and emotional awareness, which underlie resilience. At the same time, the review considers potential psychological risks, including cognitive offloading, reduced self-efficacy, emotional dependency, diminished interpersonal engagement, and over-reliance on AI for emotional decision-making. The psychological impact of AI is unlikely to depend on technological exposure alone, but rather on the nature, purpose, and extent of human–AI interaction. A human-centered perspective is therefore proposed in which AI serves as a supplementary resource for psychological self-management while preserving human agency, interpersonal relationships, and professional psychological support. Understanding these

mechanisms is essential for developing AI-enabled environments that promote adaptive coping, sustainable well-being, and psychologically resilient individuals and societies.

Keywords: Artificial Intelligence, Psychological Resilience, Coping, Self-Regulation, Emotion Regulation, Self-Efficacy, Mental Well-Being

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Beyond the machine: Rethinking AI and Human Resilience

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Abstract:

Conversation about Artificial Intelligence often focuses on technical efficiency, speed, and automation. But a society cannot become genuinely smart or resilient through better algorithms alone, it needs human insight, critical thought, and empathy. As artificial intelligence shapes how we live and communicate, Literary studies offer vital tools to help us make sense of this shift. This paper explores how reading and analysing stories about AI allows us to protect human agency, understand technological impact, and make thoughtful ethical choices.

Using critical discourse analysis and post-human literary theory, this study analyses a selection of contemporary speculative fiction and narratives about artificial intelligence. The research focuses on three main themes: Algorithmic control - How stories portray everyday life, decision-making, and freedom under automated systems.

Human-machine interaction - Collaboration and resistance with machine. Identity in crises - How technological shifts reshape our understanding of what it means to be human during periods of social uncertainty. Literature gives us a much-needed space to push back against the idea that technology has to dictate our future. When we read stories about AI, they remind us that a truly strong society isn't built on software alone—it depends spotting the hidden biases built into code, and tapping into our moral imagination. Algorithms can only look backward and process past data, but human storytelling gives us the empathy, flexibility, and creativity we need to face unexpected challenges.

Ultimately, a resilient society needs more than advanced algorithms; it needs the critical, empathetic framework that the humanities provide. Through this paper, I show that studying literature gives us the tools to guide AI integration responsibly—ensuring that as technology evolves, it continues to serve human dignity, community well-being, and democratic values.

Keywords: Literary Theory, Artificial Intelligence, Societal Resilience, Human Insights, Technological impact

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Role of RajYoga Meditation in Promoting Responsible AI Use in Higher Education

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Abstract:

Higher education institutions now experience Artificial Intelligence (AI) advancements because AI has begun to enhance every aspect of academic work including learning, teaching, research, assessment, academic writing, communication, and content development. The growing use of AI technology created efficient systems that enabled accessible personalized learning experiences however these advantages resulted in new problems which included academic integrity issues and misinformation spread and privacy violations and biased outcomes and hidden processes and loss of originality and excessive reliance on AI systems and decreased ability to think independently. Responsible AI use therefore requires not only technological competence but also self-awareness, ethical judgment, accountability, and respect for academic values.

The paper uses a narrative review together with a conceptual synthesis method to investigate how Rajyoga Meditation can help universities create responsible AI programs. The research examined literature that investigated responsible and human-centered AI together with academic integrity and ethical decision-making processes and meditation and self-awareness training and value-based educational methods. The researchers did not gather primary data because they assumed no connection between Rajyoga practice and responsible AI behavior. Responsible AI usage requires users to conduct critical assessments of AI-generated content while they must properly attribute any AI support they receive together with maintaining their privacy rights and protecting their academic integrity while taking responsibility for their decision-making. Rajyoga Meditation enables people to develop their inner capacity through self-reflection and inner discipline and emotional stability and conscious thinking and personal responsibility. Through their reflective awareness students and educators can identify when they should use AI assistance as a supporting tool and when they start becoming too dependent on it.

The paper proposes the conceptual pathway: Rajyoga Meditation → Self-Awareness → Value-Based Judgment → Responsible Decision-Making → Ethical AI Use. The link between these two concepts exists only as a theoretical construct which needs testing through actual research.

Keywords: Rajyoga Meditation, Responsible AI, Higher Education, Academic Integrity, Self-Awareness



Rajyoga Meditation and Ethical AI Engagement in Higher Education: A Conceptual Perspective

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Abstract: Artificial Intelligence (AI) has evolved into a crucial component of higher education because it provides assistance for teaching and learning as well as research and assessment and writing and information access. The increasing use of AI brings advantages to various fields but simultaneously creates ethical problems which affect academic integrity and privacy protection and the spread of false information and bias and transparency and originality and overdependence and diminished independent thought. People need to develop both technical abilities and self-awareness and reflective judgment and accountability and responsible decision-making skills to engage with ethical AI. The paper presents a study about how Rajyoga Meditation can help higher education institutions develop essential human skills. The research utilized a narrative review and conceptual synthesis approach which examined existing literature about responsible AI and academic integrity and ethical decision-making and digital literacy and meditation and self-awareness and value-oriented education. The review shows that responsible AI use requires both institutional protections and active decisions made by users to implement AI technology. Rajyoga Meditation helps people develop self-control through its practice which enables them to observe their own thoughts and control their impulses and think about their actions before taking them and about what their actions will produce. Students and educators can use AI as an academic support tool through reflective awareness which helps them maintain their ability to think independently and create original work and take responsibility for their actions. The paper establishes a conceptual framework which links Rajyoga Meditation to self-awareness that leads to reflective judgment which results in ethical choice that enables ethical AI engagement. The relationship needs empirical research to prove its validity. The paper shows that combining Rajyoga-based reflective practices with AI literacy and academic ethics will develop responsible and balanced and human-centered AI practices in higher education.

Keywords: Rajyoga Meditation; Ethical AI Engagement; Higher Education; Responsible AI; Academic Integrity; Self-Awareness; Reflective Judgment



Rajyoga Meditation for Ethical Decision-Making in the Age of Artificial Intelligence

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Abstract:

Artificial Intelligence (AI) now plays a growing role in making choices for education, healthcare, employment, finance, communication, and daily activities. The implementation of Artificial Intelligence (AI) technology brings major benefits because it increases operational efficiency while delivering precise forecasts and supporting decision-making activities, yet its widespread use creates ethical challenges because of its potential to introduce bias and compromise user privacy and hinder transparent systems and fair operations and accountable practices and the ability of users to make decisions and the need for human monitoring. Responsible AI therefore requires not only technological safeguards and institutional policies and regulatory frameworks but also ethically aware and reflective human users. The practice of Rajyoga Meditation provides a relevant approach to enhance ethical decision-making in AI-assisted environments through its core principles of self-awareness and inner stability and responsible thinking and purposeful action.

The paper uses a narrative review together with conceptual synthesis method for its research approach. The researchers studied literature about AI ethics and responsible AI and human-centered AI and ethical decision-making and human oversight and meditation and self-awareness and emotional regulation and contemplative practices. The study focused on examining peer-reviewed research articles and established research institutions. The researchers conducted thematic analysis of the literature to discover possible links between Rajyoga principles and responsible judgment capacities that include reflective awareness and emotional balance and personal responsibility and deliberate choice. The research did not collect primary data because the study did not establish any causal relationship between Rajyoga Meditation and ethical AI decision-making.

The review indicates that proper AI usage needs more than just algorithms and regulations and technical safeguards. Human judges must identify bias and explain AI recommendations while safeguarding personal information and evaluating particular situations and making final choices. Rajyoga Meditation helps people develop self-control by observing their thoughts and managing emotional responses and assessing their motivations and upcoming results and their evaluation of technology recommendations. The practice of reflective awareness enables people to create mental boundaries which separate them from AI-generated recommendations until they decide whether to implement those suggestions. The paper proposes that ethical competence should develop alongside digital and AI competence. Rajyoga-inspired reflective practices should become part of AI literacy and higher education and professional training because they help people make independent choices while understanding their actions and technological impacts. Research studies that connect Rajyoga Meditation with ethical AI decision-making research remain sparse. Future studies should use

comparative and longitudinal and experimental methods to examine how it affects ethical awareness and bias detection and responsible AI output interpretation and value-based decision making. AI systems enable people to achieve more but humans must maintain control of ethical responsibilities. Rajyoga Meditation establishes an internal structure which helps people achieve self-awareness and reflective judgment and emotional stability and responsible use of intelligent technologies.

Keywords: Rajyoga Meditation, Artificial Intelligence, Ethical Decision-Making, Responsible AI, Human-Centred AI, Self-Awareness



Integration of Artificial Intelligence-based Teacher Training Programmes and Ethical Values in the Context of NEP 2020

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Abstract:

Artificial intelligence is changing how our teachers are trained, but the speed at which it has appeared in professional learning has created ethical dilemmas that policy has yet to clarify. This paper emphasizes the intertwining of AI-based teacher training programmes with ethical values, as prescribed within the structure of India's National Education Policy (NEP) 2020. It is a conceptual and documentary contextual design, which integrates a qualitative survey of 15 academic and policy sources with a basic secondary content analysis of published survey data from an Indian sample of 60 secondary-school teachers, reported as frequency of agreement. The work is guided by two objectives: Exploring how AI training supports teachers to develop their professional and digital competencies and analyzing how ethical values and responsible AI practice are incorporated into that training. The potential analysis reveal high awareness, competence and willingness along the majority of readiness indicators is over eighty per cent agreement like with the high degree of ethical concern, including half of teachers in concern with educational quality and around two-thirds justifying the use of AI only to necessity. This confidence and caution together represent the integration gap. It's conclusion, the paper suggests that ethical AI literacy ought to form the backbone of teacher preparation under NEP 2020.

Keywords: Artificial Intelligence, Teacher Training, Ethical Values, NEP 2020, AI Literacy

Introduction: While the change in education is being asked to speed up, of course, the same cannot be said for most systems that can only retrain the people doing the teaching so fast. The new normal is for adaptive platforms, automated feedback, and generative tools to be embedded within everyday instruction and the skills a teacher needed a decade ago no longer maps neatly to what the job looks

like today (Baral et al., 2026; Jaiswal & Arun, 2021). India has read this change in policy. Aithal & Aithal (2020) and Hoque (2021) point to the fact that teacher is the lever on which quality and equity balance so as per them continuous professional development, digital pedagogy and technology integration are pre-eminent in TE in National Education Policy 2020. One move is to provide AI based teacher training mechanisms, customized, data-driven and scalable in ways most traditional in-service designs little were (Isave, 2026; Kumari & Raj, 2025).

It's not just technical competencies that are at stake. Advice from Working well with AI asks teachers to read model outputs carefully, to assess when a recommendation should be ignored, and to enjoy pedagogical power instead of deferring to a system (Yu, 2024; Singh, 2024). That judgement is where ethics comes into play. The risks of AI in classrooms biased predictions, opaque decision-making, casual harvesting of student data are all known (Holmes et al., 2022), and they do not vanish simply because a trained professional is its user. If training creates fluency but not ethical discernment, that just makes for a more efficient version of the same problem.

The paper discusses this tension. While NEP 2020 is fairly explicit about responsible, human-centred, values-driven education, it is comparatively silent on the ethical competencies that using AI entails (Raviya, 2026; Sawshilya, 2025). The Indian scholarship on this topic has oriented the conversation about AI teacher Preparation and AI ethics horizontally; empirical work has recorded enthusiasm with lingering unease (Waseem et al., 2025; Moharana, 2025). The bridge is integration; how ethical values are designed into AI-based teacher training rather than afterthoughts. The intent here is to explore that integration situating it in the framework of NEP 2020 for Indian teachers, teacher educators and training institutions.

Literature Review: At the end of the day, research on the use of AI for teacher professional development coalesces around one point: The technology alters the nature of quality teaching. Jaiswal & Arun (2021) reframe AI, not as a tool, but on how it structures that transformation in Indian education and Yu (2024) writes that generative systems raise, not lower, the bar of what counts as a teacher literacy since the act of delegating the routine work creates attention on judgement, design, and relationship. Isave (2026) takes this further into teacher education itself, demonstrating how AI can help with microteaching, lesson planning and reflective practice in a B.Ed. and M.Ed. quality of life programs without replacing the human mentor. The literature tends to be more prescriptive on training design. In this way, the capacity for personalized and adaptive professional learning to upskill teachers and for inclusive pedagogy able to reach learners conventional methods miss has long been recognized in the capability of AI (Kumar and Sharma, 2026; Moharana, 2025); even in roles that many teachers might see as outside their traditional domains (Sharma, 2025). What most of this work has in common is optimism about capability and comparative silence about when that capability is exercised well.

Objectives:

- To examine the role of AI-based teacher training programmes in developing teachers' professional and digital competencies in the context of NEP 2020.

- To analyse the integration of ethical values and responsible AI practices into teacher training within the framework of NEP 2020.

Methodology: This study employed a qualitative, conceptual and documentary research methodology, featuring a secondary analysis of published quantitative data. No primary data were obtained from teachers: the paper is not based on some questionnaire it administered, and it does not stand, even in part, on first-hand empirical claims. Structured review addresses the interpretive question of how ethical value can be integrated into AI-based teacher training under NEP 2020 and the numeric evidence is extracted with citation from one published survey in India. We underpin the analysis with two data sources. The first consists of a catalogue of fifteen academic and policy publications on AI in education, teacher professional development, and AI ethics, selected by purpose against the two objectives. The latter is the last of the survey done by Waseem et al. (2025), which used a five-point Likert scale to assess the knowledge, competence, attitude, perceived benefits, and perceived concerns of sixty secondary-school teachers; the item-level percentages are presented here as supporting evidence, not as data produced by the current author.

The analysis happened in three straightforward steps. Constructs derived from the thematic analysis of the literature revealed that competencies, ethical values, and barriers recurred across studies. Each of the constructs was mapped onto the teacher-education provisions of NEP 2020 via a policy reading. Descriptive analysis summarized the reported survey percentages, with agreement (Strongly Agree + Agree) grouped by theme and objective. Trustworthiness relies on the transparent sourcing of each table to a named reference and one-to-one traceability. The primary ethical principle is the foundation of academic honesty: correctly citing sources and no fabrication or misattribution of data.

Results and Analysis: Results of documentary synthesis and a reading of the survey percentages reported by Waseem et al. (2025). Objective 1 (competencies) is addressed in Tables 1–4; Objective 2 (ethical values) is addressed in Table 5; and both are synthesised in Table 6. Unless otherwise indicated, figures show the percentage of the sixty teachers who concurred with each statement.

Table-1: Teachers' awareness of AI and NEP 2020 provisions

Awareness indicator	Agreed (%)
Aware NEP 2020 recommends AI in education	84
Participated in NEP 2020 AI orientation programmes	74
Aware of AI personalised-learning platforms	86
Aware of AI grading and feedback tools	76
Aware of AI engagement resources (chatbots, voice assistants)	90
Regularly explore new AI teaching tools	94

Source: Waseem et al. (2025), survey of 60 secondary-school teachers.

High awareness linked to policy: 84% identified AI support in NEP 2020 and 94% meaningfully investigated new tools. This is no more than awareness of some specific tool categories: from 76% to 90%. The fact that the informational precondition necessary to train AI is largely filled for Objective 1. Tellingly, the lesser orientation figure (74%) is reminiscent, while preparation for the structured, institutionled space lags, the pull of individual curiosity beforehand outpacing design, is the exact space a designed training programme under NEP 2020 should fill.

Table-2: Teachers' self-reported AI competence and skills

Competence indicator	Agreed (%)
Can use AI tools easily	67
Can select appropriate AI tools for student evaluation	72
Possess sufficient AI knowledge and skills	90
Can design effective AI-based learning environments	86
Ready to produce AI-supported teaching materials	92
Attend seminars/events to upgrade AI skills	76

Source: Waseem et al. (2025).

High levels of self-reported competence are reflected in Table-2 90% reporting good AI knowledge and 92% willing to create AI-supported materials, but only 67% describe using AI tools as straightforward. The average competence gap between confident and competent is what Objective 1 is about: teachers feel competent, but not fluent. This means that AI-based training should rather focus on applied, hands-on skills, rather than awareness which is not sustainable, and focus on continuing education of technical professional development and thus NEP-2020.

Table-3: Teachers' attitudes and willingness to use AI

Attitude indicator	Agreed (%)
Use AI to support in-class activities	74
Use AI to solve everyday problems	84
Willing to prepare teaching materials with AI	94
Believe AI saves time in completing work	92
Consider AI crucial for teaching	70

Source: Waseem et al. (2025).

Table 3 reports willingness in a practical sense 94% would use AI to prepare materials, 92% for its time savings. Support includes beyond the classroom and daily solving problems (84%). A softer figure is that 70% report AI is "essential to education" (with almost a third undecided). In Micro Goal 1, a positive attitude is a strength upon which training can capitalize, but the reservation sentiments indicate that instrumentalist purposes have outstripped conviction in the deeper pedagogical value of AI.

Table-4 : Perceived benefits of AI in education

Perceived Benefit	Agreed (%)
AI can increase student success	87
AI assessments give accurate insight into learning	65
AI improves problem-solving ability	70
AI increases productivity	80

Source: Waseem et al. (2025).

In consonance with the above, we see from Table 4 that teachers are primarily concerned with utilitarian benefits of AI – 87% anticipate more successful student outcomes and 80% a more productive life. At the 65% mark where questions about the reliability and fairness of AI-driven assessment arise, confidence in their ability to make decisions significantly declines. It straddles both aims - the second touches objective 1 and the unease surrounding AI judgement hints at the transparency and accountability questions at the heart of objective 2.

Table 5.: Teachers' ethical and pedagogical concerns about AI

Concern	Agreed (%)	Neutral (%)	Disagreed (%)
AI negatively affects students' academic success	44	16	40
AI reduces the quality of education provided	50	24	26
Avoid using AI unless necessary	68	21	11
AI risks making students addicted to technology	49	23	28

Source: Waseem et al. (2025).

Table 5 is the ethical core. 50% of the teachers are afraid of less educational quality, 49% about student technology addiction and 68% limit the use of AI to cases where it is needed. Agreement rarely breaks anything 50%; no single disagreement gets much attention either with much wider concern but less faction. This is conclusive for purpose 2; competent teachers intentionally withholding development shows unmitigated ethical risk, precisely what values-integrated training in a human-centred NEP 2020 must contain.

Table-6: Objective-wise synthesis of teachers' AI readiness and concern

Theme	Objective	Mean agreement (%)
AI awareness (NEP 2020)	Objective 1	84
AI competence and skills	Objective 1	81
Attitudes and willingness	Objective 1	83
Perceived benefits	Objective 1	76
Ethical and pedagogical concerns	Objective 2	53

Source: Author's computation from the percentages reported by Waseem et al. (2025).

Table 6 consolidates the pattern. Mean percentages of agreement are highest across the competency-related themes (76–84%), but decline to around 53% for the concern items. In one sentence, this mismatch is the central finding of the paper: preparedness is high, ethical assurance not. This asymmetry maps immediately on both objectives and provides a rationale for embedding ethical AI literacy into teacher training, not as two separate agendas of competence and ethics, but as inseparable imperatives.

Discussion: The first target dealt with AI training and teacher competence. The empirical evidence is optimistic: 84% were responsive to aware of provisions for AI in NEP 2020; 90% self-reported sufficiency of needed AI knowledge and willingness to create materials with AI support was 92% (Tables 1–2; Waseem et al. This wider literature explains why this matters. For Jaiswal and Arun June 2022 AI is a structural change to Indian education; in Isave 2024 July 6 training can be used to place within microteaching & lesson design. However, Yu (2024) and Singh (2024) temper the optimism automation puts even greater demands on judgement, and institutional readiness varies. That gap is visible in the much lower ease-of-use figure (67%, Table 2), and marks a facet of the remote advantage: teachers may be aware of AI more than they can use it. However, the implication for NEP 2020's vision that foregrounds continuous professional development and technology integration is that AI competence should find its way into teacher-education curricula not as a one-off orientation event, but as sustained practical exposure.

The second target was the ethics integrated, and it is where the numbers turned. One-half of teachers worried that educational quality would decline, 49% the possibility of student technology addiction, and 68% limited AI to when necessary (Table 5). Confidence in AI-enabled assessment was also more muted (65%, Table 4), the threshold beyond which doubts about fairness and reliability arise. Holmes et al. (2022) provide the lens for interpreting this: Competence alone does not guarantee fairness, transparency, accountability, privacy and agency. The risks are spelled out specifically in the barrier's literature bias, weak data protection, and thin governance (Sawshilya 2025; Moharana 2025). Taken together, a capable teacher who intentionally withholds their own agency, are not resisting technology; they are rationally responding to an ethical risk that remains unresolved. What the evidence suggests is that responsible use flows from training that inserts ethical application into practice, rather than just exposure to tools.

Conclusion: In conclusion, For the first objective, evidence suggests that Indian secondary teachers are largely aware, competent and prepared to use AI with most indicators of readiness above eighty per cent a solid base from which any AI-based training can draw as long as it continues to move teachers beyond awareness towards applied fluency. While competence in data use certainly contributes, on the second of these that readiness is not matched by assurances of ethical practice: widespread anxiety regarding quality, reliance and appropriate use coupled with careful uptake opens a chasm into which competence also cannot bridge. Those two conclusions converge into a single statement proposition that ethical AI literacy is an essential, not optional element of teacher preparation. NEP 2020's promise of quality, equitable, and human centred education will not be strained as AI becomes routine in Indian classrooms but rather be realised through embedding fairness, transparency, accountability, privacy and human agency into AI-based teacher training.

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Artificial Intelligence Applications in Education: Teaching and Learning Perspectives

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Abstract: The rapid development of educational technology has fundamentally changed the way teaching and learning take place. In recent years, the growth of Artificial Intelligence (AI) has had a big impact on higher education institutions, leading them to adopt new digital tools. This conceptual review examines the growing incorporation of artificial intelligence into educational practices and analyzes how these emerging technologies are transforming both instructional methods and student learning experiences

Beyond current applications, this paper seeks to understand the potential future role of AI in education on a global scale. When used wisely, AI can greatly improve the quality of teaching and learning. However, adopting these technologies is not easy. The study examines the practical and systemic hurdles educational institutions face when implementing AI, alongside the challenges students encounter in these areas such as personalized support, learning processes, teaching practices, and administrative services. This review emphasizes on recent research on AI applications in education and provides insights into the broader implications of these developments. It concludes by proposing directions for future research and responsible implementation.

Keywords: Artificial Intelligence, augmentation, higher education, educational institutions, teaching, technologies

Introduction: Higher education has always been closely linked with technological progress and the growing power of intelligent systems. Today, rapid advances in Artificial Intelligence (AI) are opening up exciting new possibilities for teaching and learning, while also presenting significant challenges. AI is not only transforming how educators teach and students learn, but it also has the potential to reshape the fundamental design and operations of higher education institutions. Modern interest in AI began in the 1950s when scientists started exploring ways to create intelligent machines. A major milestone came with Alan Turing, who proposed the famous Imitation Game (later known as the Turing Test) as a way to determine whether a machine could exhibit intelligent behaviour indistinguishable from a human (Russell & Norvig, 2010). In 1956, John McCarthy provided one of the most widely recognized definitions, describing AI as the science of making machines capable of performing tasks that would require intelligence if done by humans (Kerr, 2017). While many definitions of AI focus primarily on cognitive abilities such as reasoning and problem-solving, they often overlook important philosophical, psychological, and ethical dimensions. Drawing from existing literature, AI can be broadly understood as computing systems that simulate human-like processes—including learning, adapting, self-correction, and the ability to analyse complex data to perform sophisticated tasks (Dacre Pool & Qualter, 2012).

AI is currently evolving at an unprecedented speed, already influencing the core services provided by higher education institutions. For example, Deakin University in Australia has successfully implemented IBM's Watson supercomputer to offer personalized academic advice to students, resulting in improved service quality, greater efficiency, and better use of resources (Moles & Wishart, 2016). Within the broader field of AI, machine learning has emerged as a particularly dynamic area. Unlike traditional programming that relies on fixed instructions, machine learning enables systems to identify patterns, make predictions, and improve their performance by learning from new data — even in situations not anticipated in their original design (Schölkopf, 2015). This conceptual review paper examines the growing applications of artificial intelligence in teaching and learning. It organizes recent studies according to key themes and concepts related to AI integration in education. The review explores how AI is currently being understood and applied in educational settings, highlights both its potential benefits and the challenges involved in its adoption, and offers a forward-looking perspective on the future role of AI in higher education worldwide.

Methodology: A structured literature search was conducted using academic and scholarly databases, including Google Scholar, Scopus, Web of Science, ScienceDirect, SpringerLink, IEEE Xplore, and ERIC. Through qualitative synthesis methodology (qualitative synthesis), this research examines and combines several recent articles (secondary sources) which will develop a holistic account of the landscape of AI and teacher education in India

Development of Artificial Intelligence in Education: Artificial Intelligence (AI) has become deeply embedded in everyday life across cities, campuses, and workplaces worldwide. From smart phones and search engines to mobile apps and smart home devices, AI quietly powers many of the tools we use daily. A familiar example is Apple's Siri, the voice assistant first introduced as an AI project in 2001 and later integrated into the iPhone in 2007 (Shulman & Bostrom, 2012). Similarly, Google leverages AI extensively in its search algorithms, while modern vehicles use it for engine management, safety systems, and navigation. Self-driving technology has advanced rapidly, with companies like Volvo, Google, and Mercedes-Benz leading the way. Early tests started in Australia back in 2015, and now autonomous trucks are widely used in the mining industry there (Beam & Kohane, 2016; Hillier, 2015).

In higher education, the focus has increasingly shifted toward placing students at the centre of the learning experience. AI offers promising solutions for supporting learners, including those with disabilities, by enabling more inclusive and interactive environments. These technologies can boost motivation and engagement for both students and teachers. Scholars have described the merging of human and machine capabilities as creating “cyborgs” — a blend of biological and technological systems (Kelley et al., 2016). Advanced computing systems that use machine learning can perform complex tasks and support individuals with diverse abilities, signalling the beginning of a new era in higher education

Artificial Intelligence Can Automate Grading in Educational Contexts: The hours spent marking papers could be better used for lesson planning, professional growth, or building meaningful connections with students. While AI is unlikely to fully replace human judgment in assessment, it can effectively handle many routine grading duties. Current AI systems already

perform well with multiple-choice, true/false, and fill-in-the-blank questions. Essay grading tools are still developing but are expected to become significantly more sophisticated and reliable in the coming years.

Students May Get Supplementary Support from AI Teachers: Although human tutors remain essential for teaching complex skills and nuanced subjects that machines cannot yet fully replicate, AI-powered tutoring systems are becoming valuable supplementary tools. Many students now benefit from AI tutors in areas such as writing support, basic mathematics, and introductory-level courses. At present, these systems are most effective at teaching foundational concepts. They are not yet capable of fostering higher-order thinking, creativity, or deep critical analysis. However, as technology advances rapidly, more advanced AI tutors that can support sophisticated learning are likely to emerge.

AI Programs help in Providing Constructive Feedback to Students and Lecturers: AI excels at delivering timely and actionable feedback to both students and instructors. Many institutions now use AI tools to track student progress in real time and alert teachers when learners are struggling academically. These systems can recommend personalized support for students while also offering lecturers insights on how to refine their teaching methods and improve course design.

AI Can Change the Role of Teachers: By taking over repetitive tasks such as grading and basic feedback, AI is reshaping the traditional role of educators. In some cases, AI can even deliver core instructional content, pose questions, and present learning materials for simpler topics. Rather than acting solely as knowledge transmitters, teachers are increasingly becoming facilitators of learning. They can leverage AI-generated resources to support struggling students while focusing their energy on providing the human elements of education empathy, mentorship, motivation, and personalized guidance that technology cannot replace.

Challenges of Artificial Intelligence Solutions: Despite its promising potential, integrating Artificial Intelligence into higher education comes with several significant challenges. A thorough review of existing studies highlights key barriers that institutions must address for successful adoption. Cost The upfront investment required for AI software, cloud infrastructure, and supporting technology is often prohibitively high for many educational institutions. Beyond initial setup, ongoing expenses — such as staff training and regular system updates to align with changing institutional needs— add substantial financial pressure.

Culture Clash and Resistance Educational institutions can be slow to embrace radical technological shifts, often viewing them with skepticism or outright resistance. With numerous AI tools and platforms available, choosing the right system and developing an effective implementation strategy can feel overwhelming. The growing number of students and tightening financial constraints have pushed universities to operate more like competitive businesses, focusing on increasing enrollment and improving efficiency. However, managing large, diverse student cohorts — many studying across different time zones — remains difficult for lecturers. Students also learn at varying paces and enter courses with different levels of preparedness. Issues such as how to enhance learning activities, conduct fair assessments, and deliver meaningful feedback continue to challenge

educators. Research on automated teaching tools, such as the Teacherbot project led by Siân Bayne, suggests that many AI interventions are driven more by productivity goals than by genuine pedagogical needs (Ferguson et al., 2015).

Lessons from MOOCs the rise of Massive Open Online Courses (MOOCs), first introduced in 2008, offers a cautionary tale. While many expected MOOCs to revolutionize higher education, they largely fell short of expectations. In many cases, institutions adopted them with unrealistic optimism, prioritizing financial gains and technological novelty over sound educational principles and evidence-based practices (Popenici, 2013). This experience highlights the risk of over-relying on technology without addressing deeper pedagogical questions.

The Rise of Teacherbots and Human-Machine Tension Recent advances in non-invasive brain-computer interfaces and powerful systems like IBM Watson have sparked discussions about redefining or even replacing traditional teaching roles. Some researchers explore using Brain-Computer Interface (BCI) devices to help students concentrate better, while others envision AI systems monitoring teacher performance or managing administrative teaching tasks (Beam & Kohane, 2016; Kena et al., 2015).

Fully online courses could eventually be powered by personalized “teacherbot” systems capable of delivering content, providing basic feedback, and supervising students. While AI can act as an effective tutor and learning manager, there is growing concern that automated solutions might replace rich, meaningful teaching with cheaper, more superficial models focused primarily on profit (Hayes, 2015; Gal, 2016).

Results and Discussion: Artificial Intelligence holds considerable potential to transform university administration, teaching practices, and student learning experiences. While AI systems can effectively handle many automated and repetitive tasks (Perez, 2016), they still struggle with the more complex, nuanced aspects of higher education (Soto et al., 2012). This review highlights how AI technologies can meaningfully enhance teaching and learning, while also underscoring their current limitations — particularly the fact that they cannot fully replace human teachers. Computer algorithms already shape many areas of daily life, from credit decisions to job recruitment. Higher education is now undergoing a similar transformation, bringing both exciting opportunities and notable risks. These developments deserve careful academic scrutiny. Institutions must therefore continue exploring appropriate technological solutions while remaining mindful of their broader implications (Bengio et al., 2013)

Technology delivers the greatest value in higher education when it expands opportunities and capabilities in research, teaching, and learning. Findings from this review align with earlier strategic documents, such as the National Artificial Intelligence Research and Development Strategic Plan, which emphasizes AI’s ability to augment human capacities and gradually blur the lines between human and machine intelligence (National Research Council, 2016).

The rapid expansion of machine learning and AI across universities presents a mix of promise and challenges. However, education remains fundamentally a human-centered endeavor. Even as AI advances, over-reliance on technology is not advisable. Humans must stay actively involved in

identifying risks, protecting privacy, maintaining control, and nurturing creativity. Educational environments should continue to welcome unexpected insights and creative learning moments rather than becoming overly scripted or automated (Council, 2011).

Although AI is often promoted as a universal fix for challenges in higher education, the reality is more nuanced. A healthy sense of academic skepticism remains essential. Educational institutions should prioritize developing responsible, well-rounded citizens rather than simply adopting the latest technological trends. The core role of technology in education should be to sharpen human thinking and enrich teaching and learning processes. As AI adoption grows, universities must guard against the risk of powerful technology companies gaining excessive control over educational algorithms. As Frank Pasquale (2015) argues, important decisions should always incorporate human judgment and ethical reflection (Secundo, Vecchio, & Passante, 2015).

Driven by budget pressures, many universities may rush to adopt AI solutions as cost-saving measures. In some cases, this might result in replacing teaching assistants and administrative staff. It is therefore crucial to examine how these shifts affect the quality of learning — especially in fields that demand creativity, innovation, and personal initiative from graduates. Overall, this conceptual review has explored the current and emerging applications of Artificial Intelligence in teaching and learning. It has examined existing research on how AI is reshaping student learning experiences within higher education institutions, while emphasizing the need for balanced, thoughtful integration that keeps human values at the center.

Conclusion: The growing presence of Artificial Intelligence in education should not overshadow important conversations about the fundamental purpose of teaching and learning. While technological progress and job displacement are becoming more common, the role of teachers must be actively reimagined — not diminished or overlooked. The integration of AI tools, such as systems used for plagiarism detection, raises critical questions about accountability and responsibility in education. Moreover, AI algorithms can unintentionally carry hidden biases, and there is a real risk that these technologies could replace key aspects of teaching that have traditionally been central to higher education (Raja Singham, 2009).

Universities today are actively rethinking their educational technology and the way they interact with AI. Higher education institutions are increasingly aware of both the opportunities and the challenges that come with adopting these technologies (Drigas & Ioannidou, 2013). When implemented thoughtfully, AI has the potential to enhance educational quality while upholding the core values and goals of higher education. Future research should continue to explore the applications and development of Artificial Intelligence, particularly its capacity to expand human knowledge and capabilities. At the same time, greater attention must be given to redefining the teacher's role in the modern era one that prioritizes creativity, imagination, innovation, and distinctly human skills that machines cannot easily replicate. Ultimately, the successful integration of AI in education will depend on maintaining a healthy balance between technological advancement and the irreplaceable human elements of teaching and learning.

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Ruskin Bond's Literature as a Child's Antidote to AI

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Abstract: Ruskin Bond's literature celebrates children's innocence, their deep connection with nature, the warmth of human relationships, and a slow-paced life. In contrast, today's Artificial Intelligence (AI) era is built on speed, data, algorithms, and the virtual world. If we examine the changes in children's society, culture, and behavior in today's AI era through the lens of Ruskin Bond's stories—such as 'The Blue Umbrella', 'The Room on the Roof', and 'The Night Train at Deoli'—a deep paradox and a crucial lesson come to light:

Shift in Social Structure: Screen vs. Society: Ruskin Bond's stories depict children growing up amidst mountains, rivers, trees, and local communities. AI has completely transformed this social fabric. Algorithms vs. Human Relationships: In Bond's stories, children understand the world by interacting with passersby, street vendors, and elders. Today, AI chatbots (such as ChatGPT, Character.ai) are becoming children's new friends. They are replacing human relationships with machine-driven dialogue, which is diminishing real-world social skills in children.

The Virtual World vs. Deoli's Platform: The suspense and deep human pull of meeting a stranger girl in 'The Night Train at Deoli' has been lost in today's era of AI-driven social media and dating apps. Today, children live in an age of 'instant connectivity,' yet they are just as lonely on the inside.

Cultural Shift-Detachment from Nature vs. The Virtual World: Bond's literature takes children into the lap of nature, where the rustling of the wind and the patter of raindrops have a music of their own. The AI era has altered this culture entirely.

'The Blue Umbrella' vs. 'Smartphones and AI Apps': In 'The Blue Umbrella', a young girl named Binya feels a deep sense of joy upon finding a simple blue umbrella, highlighting her innocence and simplicity. For today's children, that 'blue umbrella' has been replaced by their smartphone or AI gaming console. Happiness is no longer found in nature or tangible objects; instead, it is confined to screen likes and AI-generated reels.

The Mechanisation of Culture: While folklore and grandmother's tales passed down culture in Bond's stories, today AI (like Alexa or YouTube algorithms) serves children pre-determined, tailored content. As a result, children's cultural roots are weakening, making them part of a global, mechanical culture.

Behavioral and Psychological Shift-The End of Patience: The greatest hallmark of Ruskin Bond's stories is 'stillness and patience.' In his world, time moves slowly. AI has dealt the heaviest blow to this specific behavioral trait in children.

Instant Gratification: Bond's characters spend hours watching butterflies or wandering through the mountains. Today, AI and predictive text do not give children a chance to ever feel bored. Due to this absence of boredom, children's original creativity is fading, because as Bond believes, creativity is born out of emptiness and peace.

Memory and Dependence: The children in Bond's world remembered forest trails, names of plants, and the calls of birds (Cognitive Mapping). Today's child depends on AI tools for every minor task or homework assignment, which is taking a toll on their own capacity to retain memory and think independently.

Conclusion: In today's AI era, Ruskin Bond's literature acts as an 'antidote' for children. While AI can make children technologically smart, keeping them, 'human' requires the very same sensitivity, love for nature, and simplicity that blossoms in Bond's stories.



From Intelligent Society to Human-Centred Education: Reimagining Social Transformation through Educational Innovation

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Abstract:

Society changes as knowledge changes. We've gone from small traditional communities to networked digital ones, and each shift has changed how people live, work, talk to each other, and learn. Right now, we're in the middle of another one — call it an intelligent society, if you want a label for a world where information, connectivity, and constant innovation are just part of the furniture. But "intelligent" shouldn't just mean "wired up." A society only earns that word if its tools

actually improve people's lives, strengthen the relationships between them, and open doors that used to be shut. Education sits right in the middle of that project. Done well, it's the thing that connects new technology to old-fashioned human values, and turns learners into people who can actually handle a world that keeps changing under their feet.

What an Intelligent Society Looks Like: You can see the shape of it already: smart learning platforms, instant global communication, services that used to take a trip to an office now handled from a phone. Someone in a village can pull up a lecture from a university on another continent. That's real, and it matters. It also comes with a shadow side — not everyone has equal access to any of this, misinformation spreads as fast as good information, and screens have quietly eaten into the kind of face-to-face contact humans evolved for. Building an intelligent society isn't really a tech problem. It's a problem of judgment: knowing how to use these tools without losing track of who they're for.

Where Education Comes In: Education has always been the place where a society decides what to pass down and how to think. Change the way people are taught, and eventually you change the way they see problems. Innovation in the classroom project work, blended and experiential learning, digital tools, group work, new ways of assessing what students actually know isn't valuable because it's new. It's valuable when it does something old teaching often failed to do: get students curious, get them building things, get them comfortable not knowing the answer yet. A classroom like that produces a different kind of graduate. Someone who's used to ambiguity instead of frightened by it.

Technology Can't Do the Whole Job: Technology is good at delivering information, and largely useless at the rest of what teaching requires. It can't notice that a student has gone quiet lately. It can't tell the difference between someone who's stuck and someone who's given up. It has no idea what encouragement sounds like when it actually lands. That's still a teacher's job. A realistic picture of education's future isn't software replacing teachers it's software handling the parts it's good at, like delivery and flexible access, while teachers handle the parts that require being a person in the room. Neither one really works without the other.

What "Development" Should Actually Mean: If education is only measured by test scores and job placement, the wrong thing is being measured. Confidence, creativity, the ability to work with other people, some basic emotional maturity, the habit of thinking before reacting none of that shows up on a transcript, and all of it matters more once school ends. Project-based work and community-connected assignments are one way to build these things on purpose. When a student looks at a real problem in their own neighborhood and tries to fix some piece of it, knowledge stops being something to memorize for Friday and starts being something to use.

The Access Problem Nobody Gets to Skip: None of these counts for much if only some students get it. Digital resources can genuinely widen access to education but only for people who already have a device, a decent connection, and someone around who can help them use it. Right now, that's not everyone, not close. Closing that gap is a policy problem as much as a school problem, and it needs real coordination between institutions and governments, not just good intentions. It also means taking learner differences seriously rather than teaching to an imaginary average student flexible approaches that let people learn the way they actually learn, not the way a standard curriculum assumes they will.

Teachers Are Being Asked to Become Something Else: There was a time when the teacher was basically the only source of information in the room. That time is over. Students can look almost anything up in seconds, which has shifted a teacher's real value from "person who knows things" to "person who helps you figure out which things are true and what to do with them." That's a harder job, and it means teacher training can't stand still either. Teachers who are expected to prepare students for constant change need to keep learning themselves, not finish training once and coast.

The Obvious Obstacles: None of this is easy. Infrastructure is missing in a lot of places, teachers aren't always trained for the tools they're handed, institutions resist changing what's worked (or seemed to work) for decades, and leaning too hard on technology can hollow out the human interaction that made school valuable in the first place. The answer isn't to back away from technology. It's to stop treating it as the point. Technology should support what happens between a teacher and a student, not replace it. Every decision about adding a new tool or method should get run through one question: does this actually make the learner's experience better, or does it just look impressive in a report?

Where This Leaves Us: An intelligent society isn't built by smarter systems alone. It's built by people who know how to use those systems without losing sight of each other. Education is the bridge between the two and it only works as a bridge if it stays focused on people, not just on upgrading itself.

The future of schooling probably isn't "more digital." It's more human, more flexible, more attentive to the student who's falling behind and the one who's bored out of their mind. Get that right, and the technology mostly takes care of itself.

Keywords: Intelligent Society, Digital Transformation, Education Innovation, Smart Learning, Educational Technology, Experiential Learning, Teacher–Student Interaction, Inclusive Education, Digital Divide, Human-Centred Education



Periodic Continued Fractions and the Structure of Quadratic Irrationals

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Abstract:

Continued fractions provide a unique representation of real numbers and reveal deep connections to algebraic structure. This paper investigates the relationship between periodic continued fractions and quadratic irrationals. Using Lagrange's theorem, we establish that a real number has an eventually periodic simple continued fraction expansion if and only if it is a quadratic irrational. The

study analyzes the structure of periods, including purely periodic and reduced cases, and explores their application to solving Pell's equation $x^2 - Dy^2 = 1$. Computational data for $\sqrt{D}$ with $D \leq 100$ are used to illustrate variation in period length. Results show that periodicity in continued fractions directly reflects the algebraic properties of quadratic irrationals and their role in real quadratic fields $Q(\sqrt{D})$.

Keywords: Algebraic Structure, Quadratic Irrationals, Pell's equation

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मानवता के हित में नैतिक मूल्यों और उत्तरदायी कृत्रिम बुद्धिमत्ता की भूमिका

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सारांश: कृत्रिम बुद्धिमत्ता आज मानव जीवन का एक महत्वपूर्ण हिस्सा बनती जा रही है। शिक्षा, स्वास्थ्य, कृषि, व्यापार, संचार और प्रशासन जैसे अनेक क्षेत्रों में कृत्रिम बुद्धिमत्ता ने कार्यों को आसान, तेज और प्रभावी बनाया है। लेकिन इसका विकास केवल तकनीकी प्रगति तक सीमित नहीं होना चाहिए। इसका सबसे महत्वपूर्ण पक्ष यह है कि इसका उपयोग मानवता के हित में किस प्रकार किया जाए। प्रस्तुत शोध का मुख्य उद्देश्य नैतिक मूल्यों और उत्तरदायी कृत्रिम बुद्धिमत्ता के बीच संबंध को समझना है। कृत्रिम बुद्धिमत्ता से मिलने वाले लाभ तभी सार्थक हैं, जब इसके विकास और उपयोग में मानव गरिमा, समानता, न्याय, स्वतंत्रता, गोपनीयता और सामाजिक जिम्मेदारी जैसे मूल्यों का ध्यान रखा जाए। यदि कृत्रिम बुद्धिमत्ता के निर्णयों में पक्षपात, भेदभाव, गलत सूचना या निजी जानकारी के दुरुपयोग जैसी समस्याएँ उत्पन्न होती हैं, तो इसका प्रभाव समाज के कमजोर वर्गों पर अधिक पड़ सकता है। इसलिए कृत्रिम बुद्धिमत्ता को मानव का विकल्प बनाने के बजाय मानव के सहयोगी के रूप में विकसित करना आवश्यक है। उत्तरदायी कृत्रिम बुद्धिमत्ता का अर्थ ऐसी तकनीक से है, जो पारदर्शी, निष्पक्ष, सुरक्षित और जवाबदेह हो तथा जिसके निर्णयों में मानवीय नियंत्रण बना रहे। इस दिशा में सरकार, तकनीकी संस्थानों, शिक्षण संस्थानों, उद्योग और समाज की साझा भूमिका आवश्यक है। शोध यह स्पष्ट करता है कि तकनीकी क्षमता के साथ नैतिक सोच का विकास भी जरूरी है। मानव-केंद्रित और उत्तरदायी कृत्रिम बुद्धिमत्ता ही ऐसी तकनीकी व्यवस्था का निर्माण कर सकती है, जो विकास के साथ-साथ मानव अधिकारों, सामाजिक न्याय और सामूहिक कल्याण को भी सुनिश्चित करे।

मुख्य शब्द: कृत्रिम बुद्धिमत्ता, नैतिक मूल्य, सामाजिक न्याय, मानव अधिकार, तकनीकी विकास, मानवीय नियंत्रण, सामाजिक कल्याण

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कृत्रिम बुद्धिमत्ता के युग में शिक्षा, अधिगम और ज्ञान सृजन के बदलते आयाम

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सारांश:

वर्तमान समय में कृत्रिम बुद्धिमत्ता शिक्षा के क्षेत्र में तेजी से अपनी जगह बना रही है। इसके कारण पढ़ाने, सीखने और ज्ञान प्राप्त करने के पारंपरिक तरीकों में महत्वपूर्ण बदलाव दिखाई दे रहे हैं। आज विद्यार्थी केवल पुस्तकों और कक्षा तक सीमित नहीं हैं, बल्कि कृत्रिम बुद्धिमत्ता की सहायता से अपनी आवश्यकताओं और रुचियों के अनुसार जानकारी प्राप्त कर सकते हैं। शिक्षक भी पाठ्य-सामग्री तैयार करने, विद्यार्थियों की सीखने की क्षमता को समझने तथा व्यक्तिगत मार्गदर्शन देने में इसका उपयोग कर रहे हैं। इस प्रकार कृत्रिम बुद्धिमत्ता शिक्षा को अधिक सरल, संवादात्मक और विद्यार्थी-केंद्रित बनाने की क्षमता रखती है। प्रस्तुत शोध का उद्देश्य शिक्षा, अधिगम और ज्ञान सृजन के क्षेत्र में कृत्रिम बुद्धिमत्ता के बदलते स्वरूप को समझना है। कृत्रिम बुद्धिमत्ता विद्यार्थियों को त्वरित जानकारी उपलब्ध कराने के साथ-साथ नए विचारों को विकसित करने, समस्याओं को समझने और रचनात्मक कार्य करने में भी सहायता कर सकती है। इसके माध्यम से ज्ञान केवल प्राप्त करने की प्रक्रिया नहीं रह जाता, बल्कि विद्यार्थी स्वयं प्रश्न पूछकर, विचारों की तुलना करके और नई सामग्री तैयार करके ज्ञान सृजन में सक्रिय भूमिका निभा सकते हैं। हालाँकि, कृत्रिम बुद्धिमत्ता के बढ़ते उपयोग के साथ कुछ चुनौतियाँ भी सामने आती हैं। गलत या अधूरी जानकारी, तकनीक पर अत्यधिक निर्भरता, नकल की प्रवृत्ति, गोपनीयता और डिजिटल असमानता जैसी समस्याएँ शिक्षा की गुणवत्ता को प्रभावित कर सकती हैं। इसलिए आवश्यक है कि कृत्रिम बुद्धिमत्ता का उपयोग मानवीय संवेदनशीलता, नैतिक मूल्यों और शिक्षक के मार्गदर्शन के साथ किया जाए। शोध का निष्कर्ष है कि उचित और जिम्मेदार उपयोग के माध्यम से कृत्रिम बुद्धिमत्ता शिक्षा और ज्ञान सृजन को अधिक प्रभावी, समावेशी और भविष्य की आवश्यकताओं के अनुरूप बना सकती है।

मुख्य शब्द: कृत्रिम बुद्धिमत्ता, शिक्षा, अधिगम, ज्ञान सृजन, डिजिटल शिक्षा, विद्यार्थी-केंद्रित शिक्षा, डिजिटल समानता।

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Artificial Intelligence, Misinformation and Electoral Democracy: Challenges to Political Participation and Democratic Governance

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Abstract: Artificial intelligence is changing the information environment for fair democratic elections, bringing up urgent questions about political participation and democratic governance. This paper focuses on the threat to the integrity of electoral processes from AI-generated misinformation, including deepfakes, synthetic political content and amplification of incorrect information. The research is qualitative in approach, based on secondary data, with a doctrinal, comparative and analytical research design, supported by a systematic literature review. The research uses peer-reviewed academic research, institutional reports and regulatory documentation, including the Election Commission of India's advisories, and India's 2026 Information Technology Rules amendments. The results suggest that AI-generated misinformation is spreading through fabrication, amplification of algorithms and declining credibility of authentic content, and that its effects on voter attitudes even when the audience suspects manipulation. India's regulatory response is progressing at a great pace but remains unfruitful across multiple legal domains and mostly reactive, depending on post-circulation takedown obligations instead of preventive failsafe. The study concludes that a strong legal framework, stronger platform accountability, sustained online literacy efforts, and better institutional coordination is required, in an effort to protect democratic governance, so that technological innovation enhances political participation and democratic legitimacy rather than eroding it.

Keywords: Artificial Intelligence; Misinformation; Electoral Democracy; Political Participation; Democratic

Introduction: Artificial intelligence is changing how political information is generated, spread and utilized, reforming the relationship between citizens, politicians and the electoral process. What was once restricted to text-based propaganda has evolved into hyper-realistic and cloned videos, fake voices and narratives created by algorithms capable of imitating political leaders at a scary scale. The World Economic Forum's Global Risks Report 2024 ranked AI-driven misinformation and disinformation as the most critical short-term global risk, ahead of climate change and armed conflict, placing this concern in the 2024 "super election year," in which billions of citizens across dozens of countries participated in national elections [1]. Early scholarship on AI-generated text as a way of media misinformation [2] has since been increased by research on microtargeted deepfakes and their effects on political attitudes [3], alongside warnings that misinformation causes a more serious threat to democratic governance [4]. In India, AI-manipulated videos and fake political audio went viral during the 2024 Lok Sabha elections, pushing the Election Commission of India to issue guidelines directing political parties to abstain from using deepfakes and to remove such content within a specific timeframe [5]. However, these responses have remained reactive rather

than governed by a strong legal framework. Existing literature is excessively focused on American and European elections, and tends to examine either the technological effects of AI-generated content or the governance response, rarely together. This paper explains this gap by examining the cross among artificial intelligence, misinformation and electoral democracy, emphasizing on how AI-generated content affects politics, how vulnerable digitally fewer literate populations are, and whether India's current legal and institutional frameworks are capable of responding to these risks.

Materials and Methods: This research uses a qualitative, secondary-data based approach, shaped around a doctrinal, comparative and analytical research design followed by a systematic literature review. A qualitative approach was preferred because the study deals with the understanding of nature, mechanisms and impacts on governance of AI-generated misinformation, rather than generating statistical data of its prevalence. In the absence of primary fieldwork, the research depends on secondary sources: peer-reviewed journal articles, institutional reports, legal and regulatory documents, and documented case material from recent elections. The doctrinal part includes analysis of legal and regulatory components related to AI-generated political content in India, including the guidelines of Election Commission of India, dated 6 May 2024 [5], its subsequent statements on labelling synthetic content issued in 2025 [6,7], and the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Amendment Rules, 2026, notified by the Ministry of Electronics and Information Technology through Gazette Notification G.S.R. 120(E) [8,9]. This component explains how existing law has evolved to safeguard the credibility of digital democracy. The comparative component relies on approaches used by other democracies, including prohibition-based and disclosure-based models [10], to place India's regulatory pathways within a broader global pattern. The analytical component includes a structured review of academic literature studying the psychological and political effects of AI-generated misinformation, identified through academic databases using keywords including "AI misinformation," "deepfakes," "electoral democracy" and "synthetic media." Only peer-reviewed articles, recognised institutional reports, and verifiable government and legal documentation were included to preserve source integrity.

Generative AI Disclosure: Generative AI (Claude, Anthropic) was used during the preparation of this manuscript to accommodate the organizing process of this manuscript, synthesising and structuring findings from sources identified by the author, and formatting references, under the author's direction and review. All factual claims, sources and citations were independently verified by the author against the original material prior to submission.

Results And Discussion: Nature and Mechanisms of AI-Generated Misinformation AI-generated incorrect information works through three interlinked mechanisms. The first is direct fabrication, where synthetic videos, cloned audio or fake images show politicians making arguments that never happened, for instance the AI-edited videos circulated during India's 2024 general election [11]. The second is algorithmic amplification, where microtargeted delivery expands the scope of synthetic content to specific voters, a dynamic shown to produce empirical changes in political attitudes [3]. The third is the declining trust in authenticity of content, termed the "liar's dividend," where the chances of manipulation allow genuine content to be dismissed as fraud [12]. Impact on Voter

Perception and Political Participation Experimental evidence shows that fake video content that suggests a political scandal can change how people vote and how they feel about politics. This happens even if the people watching know the content might not be real. When journalists verify the facts, it helps minimize the negative effects. Comparing the 2016 and 2024 US elections the impact of this kind of content has gotten much worse. This is because more people now have access to tools that create content thanks to the rise of big language models. These results show that seeing content early can determine how people feel about politics. Even if they later learn the truth the effect might still be there. Also, the degrading trust caused by the fake content might make people stop paying interest in politics.

Disproportionate Impact on Vulnerable Populations: Lower literacy and lower AI literacy are linked to a weaker ability to spot AI-generated content as synthetic. This means that groups with less knowledge of digital tools, such as older voters and people with less formal schooling are easily fooled. This issue is especially important in India, where many voters, in rural and semi-urban areas do not know how to recognize markers of synthetic media. As a result, the digital divide is widening and spreading the risk evenly across all voters. Analysis of India's Legal and Regulatory Response India's statutory framework follows a series of steps and guidance-based rules. The Election Commission issued an advisory in May 2024 that warned political parties to remove fake audio or video within three hours once they become aware of it. This was done under the Representation of the People Act, 1951 and the Information Technology Act, 2000 [5]. The 2025 guidelines added a system for identifying and informing people about AI-generated content. This meant that AI content had to be labeled with rules on how big and how long it had to be in different formats [6,7]. In 2026 new rules were added. These rules, called the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Amendment Rules, 2026 were announced on February 10 2026. These rules clarified that synthetic information had to be verified by platforms. This included a three-hour rule for taking down content that was flagged as wrong. Also, platforms had to label and show where the content came from [8,9]. This is a kind of rule that affects the platforms directly. It works with the earlier advice given to political parties by the Election Commission. Even though there has been progress there is no one law that deals with AI-generated content in India. The rules are spread out across areas like election laws, information technology laws and rules about pretending to be someone else or hurting someone's reputation. The responsibility depends on what the content does and what happens because of it [9]. This fragmented way of making rules means that enforcement is about removing fake content after it is uploaded, not stopping it before it spreads. There is no law that directly deals with AI-generated false information, in elections. This causes a problem.

Comparative Insights and Recommendations: Looking at how other countries regulate we see different ways to address this issue. Some countries use bans on fake political content before election periods. Others focus on disclosure and transparency similar to how India works [10]. India is on the side of transparency using disclosure and take-down rules. It does not have the strong preventive rules used elsewhere. From these results I suggest the following actions:

- Create a law that deals only with AI-generated electoral misinformation instead of using many separate rules;

- Add preventive checks for AI-generated political content during campaign times in addition to the current take-down methods;
- Make platforms more responsible with clear public lists of content that has been flagged;
- Keep teaching people about AI and digital skills, especially how to spot synthetic media and put this learning into voter education;
- Improve coordination, among the Election Commission, the Ministry of Electronics and Information Technology and independent fact-checking groups so that rules can keep up with new AI tools. However, these conclusions have some limitations. The study uses doctrinal research, not direct surveys of Indian voters. It also shows the law and rules as of the current time period. Future evolutions could make some parts of this study outdated as new guidelines are introduced according to changing situations.

Conclusions: Use of Artificial intelligence has transformed electoral democracy. This study shows that misinformation generated by intelligence severely affects people's participation in politics by making false narratives, spreading them through algorithms and breaking the trust of people who are less acknowledged with digital technology. India's rules have slowly changed since 2024. They are still unfruitful and reactive. India does not have a law that covers artificial intelligence and it waits until after bad content is out before removing it instead of stopping it before it spreads. India could learn from other democracies to build a better preventive framework. Protecting democracy in the age of intelligence will need steady work from institutions. It will need laws, responsibility from online platforms, more digital knowledge, for people and joint oversight. This way technology can help boost the democratic political participation.

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Artificial Intelligence for Enhancing Resilience

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Abstract:

Artificial intelligence (AI) has revolutionized various facets of human existence, profoundly transforming industries, improving efficiency, and fostering innovation [1-3]. In today's world, resilience-the capacity to endure, adapt, and thrive amidst challenges and adversities-has emerged as a critical concern across different sectors. Ensuring sustainability, stability, and continuity in the face of unpredictable disruptions is paramount [4-5]. This research investigates the significant role of AI in bolstering resilience across various domains, including infrastructure, disaster response, climate change, healthcare, business, cybersecurity, community development, supply chain management, urban planning, ecological conservation, hospitality, tourism, and psychological well-being. Infrastructure is vital to any society, underpinning essential services and economic activities

In an increasingly complex and unpredictable world, resilience-the ability to withstand and recover from adverse conditions is essential across various sectors. This research paper investigates the transformative potential of artificial intelligence (AI) in enhancing resilience across multiple domains. We explore how AI technology can be utilized to develop resilient infrastructure, providing advanced predictive maintenance and real-time monitoring capabilities that ensure robustness and longevity. The study examines the role of AI in improving disaster response, offering rapid data analysis and decision-making support to enhance emergency management outcomes. In climate change, AI-driven strategies are assessed for their effectiveness in fostering climate resilience, including predictive modeling of extreme weather events and optimizing resource allocation. The paper also discusses AI applications in healthcare resilience, such as enhancing diagnostics, patient care, and operational efficiency during crises. Business continuity and crisis management are examined, highlighting AI's capability to anticipate disruptions and maintain

operational stability. The paper emphasizes the importance of strengthening cybersecurity resilience using AI to detect and mitigate threats proactively. AI's role in enhancing community and social resilience is analyzed, particularly in supporting vulnerable populations and fostering social cohesion. Additionally, we explored AI-powered solutions for urban resilience, focusing on smart cities and sustainable development. The study also covers AI's contributions to environmental and ecological resilience, resilient supply chain management, and resilience in the hospitality and tourism industry. Finally, we investigated AI's potential in fostering psychological resilience, providing personalized mental health support and stress management tools. Through these diverse applications, the paper underscores AI's critical role in building a resilient future.

Keywords: Provide max, Artificial intelligence, psychological resilience, urban resilience, supply chain resilience, cybersecurity resilience, environmental resilience, ecological resilience, social resilience.

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Role of Science Exhibition in Enhancing Scientific Attitude among Students at the Secondary Level

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Abstract:

Science education aims not only to develop knowledge of scientific concepts but also to cultivate a scientific attitude among learners. Scientific attitude encourages students to develop curiosity, objectivity, rational thinking, open-mindedness, critical thinking, and a willingness to examine evidence before accepting conclusions. At the secondary level, students are in an important stage of intellectual development in which opportunities for observation, experimentation, questioning, and problem solving can strengthen these qualities. Science exhibitions provide a meaningful learning environment in which students can select problems, develop models or projects, demonstrate scientific principles, observe outcomes, discuss ideas, and communicate their findings. Such experiences may connect classroom learning with practical situations and encourage active participation in science. Therefore, the present study focuses on examining the role of science exhibitions in enhancing scientific attitude among students at the secondary level.

Keywords: Science Exhibition; Scientific Attitude; Secondary Level; Science Education; Experiential Learning

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Impact of Fashion Trends on Students' Development in a Changing Environment: A Study

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Abstract:

The changing social environment has made fashion an important part of students' everyday lives. Fashion is no longer limited to clothing and appearance; it is also associated with self-expression, social interaction, confidence, lifestyle choices, and exposure to digital media. Students are increasingly influenced by social media, peer groups, films, celebrities, and rapidly changing fashion trends. These influences may have both positive and negative implications for students' overall development. Fashion may encourage creativity, self-expression, confidence, social awareness, and openness to change. However, excessive concern with fashion may also contribute to social comparison, peer pressure, distraction from studies, and unnecessary expenditure. The present study therefore focuses on understanding the relationship between fashion trends and students' development in a changing environment. The study is intended to provide an educational perspective on how fashion-related attitudes and practices may influence students' academic, social, psychological, behavioural, and personality development.

Keywords: Fashion Trends; Students' Development; Changing Environment; Social Media; Personality Development



The Impact of Incorporating Real-World Application of Chemistry on Students' Engagement

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Abstract:

The present study, entitled "The Impact of Incorporating Real-World Applications of Chemistry on Student Engagement," aims to examine the effect of connecting chemistry concepts with real-life situations on students' engagement in learning. Chemistry is often perceived by students as an abstract and difficult subject because many concepts are taught through theoretical explanations and textbook-based examples. Integrating real-world applications, such as chemistry in cooking, medicines, agriculture, environmental issues, household products, and industrial processes, may help students understand the relevance and usefulness of chemistry in everyday life. The study focuses on three major dimensions of student engagement: cognitive, emotional, and behavioural

engagement. An experimental approach may be used to compare students taught through traditional teaching methods with students taught through real-world application-based chemistry teaching. A suitable sample of secondary-level students, particularly Class X students, may be selected from a school. A student engagement scale/questionnaire may be administered to assess students' engagement before and after the intervention. Appropriate statistical techniques, such as mean, standard deviation, and t-test, may be used to analyse the collected data.

It is expected that students exposed to real-world applications of chemistry will demonstrate greater interest, participation, understanding, motivation, and involvement in classroom learning than students taught through conventional methods. The study may provide useful insights for chemistry teachers, teacher educators, curriculum developers, and educational institutions regarding the importance of contextual and application-based teaching. The findings may also contribute to making chemistry learning more meaningful, relevant, interactive, and engaging for secondary-school students.

Keywords: Real-world applications, Chemistry teaching, Student engagement, Cognitive engagement, Emotional engagement, Behavioural engagement, Secondary education.



Impact of LinkedIn on Teachers' Professional Growth and Career Mobility

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Abstract:

In today's digital age, LinkedIn is no longer just a site for job hunting—it has evolved into a powerful space for educators to keep learning and build their careers. This research paper looks at how LinkedIn shapes the way teachers learn new skills, connect with peers, and discover fresh career opportunities. To gather real-world insights, this study collected data through surveys and discussions with 150 school and college teachers. The findings show that teachers who actively use LinkedIn find it much easier to pick up modern teaching techniques and connect with educators globally. On top of that, regularly sharing their knowledge and classroom experiences helps them stand out in their field. This extra visibility often opens doors to guest lectures, research collaborations, consultancy work, and better job offers. Ultimately, this paper highlights that LinkedIn is a game-changer for modern teachers looking to take control of their professional growth.

Keywords: Teacher Development, LinkedIn, Career Growth, Digital Networking, Teaching Techniques, Professional Network.



A Study on the Relevance of Educational Ideas Embedded in the Discourses of Acharya Tarun Sagar Ji in the Present Time: An Inquiry into Moral Pedagogy, Character Building, and Value-Based Modern Education

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Abstract:

This study investigates the profound educational ideas and moral pedagogy embedded within the discourses of Acharya Tarun Sagar Ji Maharaj (1967–2018), a renowned Digambara Jain monk famed for his iconic Kadve Pravachan (Bitter Discourses). Beyond his spiritual leadership, Acharya Ji's public discourses operated as a powerful reformist medium designed to restructure contemporary human values and social consciousness. In an age where formal education is increasingly driven by commercialization, material accumulation, and technical skill acquisition, moral character, emotional resilience, and civic responsibility are often sidelined. This research paper critically evaluates how Acharya Tarun Sagar Ji's pragmatic, fearless, and accessible ethical framework provides actionable solutions to the prevailing crisis of values in modern education. His teachings prioritize Samskara (value acquisition) over mere degree accumulation, offering a practical blueprint for value-based education, character building, and social harmony.

In contemporary society, the rapid expansion of technology, globalization, and intense competition has oriented the educational ecosystem heavily toward technical proficiency and material success. Consequently, the fundamental purpose of education—nurturing ethically grounded and emotionally balanced human beings—has suffered significant erosion. Acharya Tarun Sagar Ji introduced a revolutionary style of discourse designed to awaken individual conscience and social responsibility. His teachings bridged ancient spiritual philosophy and modern socio-cultural realities, asserting that education devoid of moral character is detrimental to both individual well-being and collective societal stability.

Core Educational Principles in his Discourses:

Character Building Over Degree Accumulation (Samskara vs. Literacy):

Acharya Tarun Sagar Ji consistently argued that current education systems produce 'literate professionals' rather than 'developed human beings.' He emphasized that Samskara (ethical culture) must precede intellectual knowledge, asserting that academic degrees without moral integrity remain hollow credentials.

Practical Integration of Core Ethics (Ahimsa, Satya, Aparigraha)

Translating classical principles into daily conduct, he taught: Ahimsa (non-violence in action and speech), Satya (uncompromising truthfulness in civic life), and Aparigraha (contentment and restraint against excessive consumerism).

Keywords: Educational Ideas, Pedagogy, Pragmatic, Samskara, Intellectual Knowledge



Study of the Effects of Tiffin Culture and Cultural Food on the Social Development of Students

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Abstract:

The formative years of schooling constitute a crucial period for the development of children's social competencies, interpersonal relationships, and emotional dispositions. While formal classroom experiences contribute substantially to children's learning, routine social experiences and informal peer engagements also provide significant opportunities for social learning. In this context, tiffin time can be viewed as an underexplored yet potentially meaningful social-learning space where students interact with peers, exchange food, communicate informally, and encounter diverse cultural practices. Exposure to and exchange of culturally diverse food practices may foster mutual understanding, cultural awareness, cooperation, empathy, acceptance, and respect for diversity. Despite its potential educational and social significance, the contribution of tiffin culture and cultural food to the social development of primary school students has received comparatively limited attention. The present study therefore seeks to examine the effects of tiffin culture and cultural food on the social development of primary school students in Jaipur district, with particular emphasis on peer bonding, communication, cooperation, sharing behavior, cultural acceptance, empathy, and social interaction. The study will employ a descriptive survey method with a mixed-methods approach to obtain a comprehensive understanding of students' tiffin-related experiences and social behaviors. Data will be gathered through a self-designed student questionnaire and a lunch-time observation checklist focusing on tiffin-sharing practices, peer interactions, cultural food exposure, communication, cooperation, and sharing patterns. Quantitative data will be subjected to appropriate statistical analysis, including Mean, Standard Deviation, and Correlation, while qualitative observations will be interpreted to provide contextual depth and strengthen the overall understanding of the phenomenon. The study is anticipated to demonstrate that positive tiffin-sharing experiences may foster stronger peer relationships, enhance communication and cooperation, cultivate empathy, and promote greater acceptance of cultural diversity among young

learners. Exposure to varied regional and cultural food practices may further stimulate curiosity, cultural appreciation, and a sense of social inclusion. Nevertheless, individual food preferences, hygiene considerations, reluctance to share, and variations in family and cultural practices may shape students' participation in such interactions. The study will consequently seek to develop a nuanced understanding of the social and cultural significance of tiffin practices within the primary school environment. It is expected that the findings will underscore the potential of tiffin time as an informal avenue for social learning, through which children can acquire essential interpersonal competencies while developing sensitivity towards cultural diversity. The study may offer valuable pedagogical implications for teachers, school administrators, and parents in fostering inclusive, cooperative, and culturally responsive school environments conducive to the holistic development of young learners.

Keywords: Tiffin Culture, Cultural Food Practices, Social Development, Peer Relationships, Cultural Awareness, Social Interaction, Empathy, Primary School Students



A Study on the Impact of Cybernetics in the Modern Teaching-Learning Process

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Abstract:

The present study is entitled “A Study on the Impact of Cybernetics in the Modern Teaching-Learning Process.” Cybernetics deals with control, communication, feedback, and self-regulation within a system. These concepts are relevant to the teaching-learning process, where continuous communication and feedback between teachers and learners contribute to effective learning. The study examines the use of cybernetic principles in modern digital teaching-learning platforms, with particular focus on information flow, feedback loops, self-regulation, and control mechanisms. It also examines the effect of real-time feedback on students' retention, self-correction, and mastery of concepts. In addition, the study explores the attitudes and perceptions of teachers and learners towards the changing role of teachers in technology-supported learning environments. The study adopts a mixed-method research approach, comprising a descriptive survey, a quasi-experimental pre-test and post-test method, and qualitative interviews. The study covers secondary school teachers and students in Jaipur district. The sample consists of 60 teachers and 120 students. Data are collected through appropriate research tools and are analyzed using suitable statistical techniques, including percentage, mean, standard deviation, and t-tests. Qualitative data are analyzed thematically. The study provides an understanding of the role of cybernetic principles in

modern teaching and learning and highlights the importance of feedback, communication, technology, and self-regulated learning in the secondary education context.

Keywords: Cybernetics, Teaching-Learning Process, Feedback, Self-Regulation, Digital Learning, Educational Technology, Secondary Education



Impact of Online Gaming on the Attitude of Secondary School Students

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Abstract:

Secondary education is a critical developmental stage during which students form foundational habits, values, and attitudes. With the widespread adoption of smartphones and internet access, online gaming has become a prevalent activity among secondary school students. While online games can offer entertainment, cognitive stimulation, and digital literacy, excessive engagement may adversely affect students' academic attitudes, familial relationships, social interactions, and emotional well-being. Prolonged gaming—particularly late at night—frequently correlates with diminished concentration, disrupted sleep patterns, reduced classroom participation, and a decline in academic interest. Consequently, this study examines the relationship between online gaming habits and the attitudes and daily behaviors of secondary school students.

The study focuses on students in grades 9 through 12. A survey-based methodology was employed to investigate students' online gaming habits and their impact on daily life. The questionnaire assessed daily gaming duration, game preferences, study routines, and attitudes toward school and family. Additionally, feedback and observational data from parents and teachers were incorporated to evaluate shifts in behavior, attention spans, and social interactions. The research design adopts a balanced perspective, acknowledging both the potential benefits and detriments of online gaming rather than categorizing the activity as inherently detrimental.

Findings indicate that the impact of online gaming is contingent upon the duration and management of gameplay. While moderate gaming can offer entertainment and a brief respite from academic routines, unregulated and prolonged engagement is significantly associated with a decline in classroom interest, increased irritability, reduced family interaction, and impaired concentration during school hours. Educators specifically noted heightened fatigue and distractibility among students who engaged in late-night gaming. Furthermore, the results underscore the necessity of establishing clear screen-time boundaries and promoting physical and outdoor activities.

In conclusion, while online games are not inherently harmful, excessive and unregulated gameplay can negatively influence students' attitudes, behaviors, and academic engagement. Thus, a balanced approach is imperative. Parents and educators must collaborate to guide students in cultivating healthy gaming habits, enforcing appropriate screen-time limits, and ensuring adequate time is allocated for academics, physical activity, familial interactions, and sleep. Responsible digital technology usage enables students to harness its benefits without compromising their daily functioning and overall well-being.

Keywords: Online Gaming, Student Attitude, Secondary Education, Adolescent Behavior, Screen Time, Digital Technology



Generative Artificial Intelligence in Education: A Study of Its Impact on Teaching, Learning and the Changing Role of Teachers in the Digital Era

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Abstract:

The unprecedented advancement of AI offers a lot of new possibilities but also brings a set of new challenges in education sector. The goal of this study was to explore the impact of Generative AI on teaching and learning and its influence on the changing roles of the teachers in digital age. The focus of this study was the application of Gen AI in personalized learning, generation of educational content, teacher support, academic integrity, accuracy of information, privacy issue and digital divide. A qualitative descriptive review approach to extensive research was developed using relevant modern research works, education reports and policy frameworks in relation to AI in education. This involves thorough review of available relevant materials in order to critically understand existing as emerging challenges and opportunities associated with implementation of Gen AI between teachers and learners.

Qualitative descriptive review method and Thematic analysis was performed on various literature resources using Major themes that arose from the studies review such as Personalized learning, Teacher's professional development, AI in Assessment, Academic Integrity, and Ethical implications & Digital divide. The results from analysis were interpreted and used to analyze roles and competencies teachers require in AI supported learning and teaching environment.

Review showed that Generative AI would provide the teachers with effective support in personalized learning, instructional material generation, and teaching planning and it also provide

instant learning assistant for learners while it poses some issues of the academic dishonesty, fact accuracy of the output produced by Gen AI, privacy, lack of access to technology and over-dependency of AI. Through review analysis, teachers are found to act as facilitator, mentor, learning designer, validator and moral guardian in the face of these many developments other than just being a disseminator of knowledge.

The results clearly showed that Gen AI could contribute greatly to human learning and teaching provided it is put into practice on human centered and ethical framework. Teacher's AI literacy, continuous professional development and formal policy direction from the relevant institutions shall ensure proper use of AI in keeping high the quality and humanity of education.

Keywords: Generative Artificial Intelligence, education, AI literacy, teaching-learning, personalised learning, teachers, digital education, academic integrity.

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Artificial Intelligence for Inclusive English Language Learning: Addressing Diverse Learners' LSRW Needs through Targeted Teaching Strategies

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Abstract:

Every English classroom has students who learn differently. Some students are comfortable speaking English, while others may find it difficult to understand what they hear, read a passage, or express their thoughts in writing. Differences in language background, previous exposure to English, learning pace, and confidence can affect the way students learn. Listening, Speaking, Reading, and Writing (LSRW) are important parts of English language learning, but the same teaching method may not work equally well for every learner. Artificial Intelligence (AI) is creating new possibilities in education and can be useful in responding to these differences. With the right guidance, AI can provide learners with additional practice, learning materials, feedback, and opportunities to learn at their own pace. This makes it worth exploring how AI can support teachers in addressing the different LSRW needs of English learners.

This paper is based on a review of books, research papers, reports, and other relevant literature related to Artificial Intelligence, English language learning, inclusive education, LSRW skills, and targeted teaching strategies. The paper looks at how AI can be used to support learners who have different needs in Listening, Speaking, Reading, and Writing. It also discusses the use of AI along with teaching strategies such as differentiated instruction, scaffolding, peer learning, visual support,

and activity-based learning. The role of teachers in selecting and using AI tools according to the needs of their learners is also discussed.

The review shows that AI can provide useful support to English learners with different learning needs. For listening, learners can get opportunities to listen to English material more than once and practise at their own pace. In speaking, AI-based activities can give learners additional opportunities to practise conversations and pronunciation. In reading, AI can help learners understand difficult words, passages, and ideas, while in writing it can provide suggestions and opportunities to improve their written work. At the same time, AI cannot meet every learning need on its own. Lack of access to technology, incorrect or unsuitable feedback, privacy concerns, and limited teacher awareness can create difficulties. Therefore, AI needs to be used carefully and with proper teacher guidance. The teacher still has an important role in understanding the learner, choosing suitable activities, and deciding how much support is actually required.

Artificial Intelligence can become a useful support for inclusive English language learning when it is used according to the needs of learners. It can provide students with more opportunities to practise their LSRW skills and can help teachers offer different kinds of learning support. However, effective use of AI requires proper teacher guidance, responsible use of technology, and equal opportunities for learners to access it. A balanced combination of teacher-led teaching and AI-supported learning can help create English classrooms that are more inclusive, flexible, and responsive to learner needs.

Keywords: Artificial Intelligence, Inclusive Education, English Language Learning, Diverse Learners, LSRW Skills, Targeted Teaching Strategies



Psychological Distress and Transformation of Personality: A Study Done on Educated and Jobless Young People in Post-Digital Era

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Abstract:

The advancements in technology and qualifications have left an educated youth with psychological distress as an easy target. The purpose of this study was to determine the prevalence of psychological distress (anxiety, isolation, or helplessness regarding the future) and its prediction via big-five personality traits among Gen-Z graduates of age bracket 20 to 26, who are unemployed.

The research is a correlational cross-sectional study which employed a multi-stage stratified random sampling approach among 380 unemployed tertiary graduates.

The standardized approaches adopted in the research include the Kessler Psychological Distress Scale (K10) and the Big Five Inventory-2 (BFI-2). The analysis also comprised of Pearson's Product-Moment Correlation, Multiple Linear Regression and Structural Equation Modelling (SEM) using SPSS/AMOS to determine the nature of the relationship chronic unemployment distress and alterations in personality traits.

Moderate to severe levels of psychological distress were detected in 68.4% of the sampled participants. The regression and SEM analyses revealed that chronic unemployment-related distress significantly predicted decreases in the personality domain of Conscientiousness ($\beta = -0.34$, $p < 0.001$) and Extraversion ($\beta = -0.41$, $p < 0.001$) and increases in Neuroticism ($\beta = 0.52$, $p < 0.001$). Prolonged economic inertness provokes dynamic depletion of self-efficient and prosocial personality traits. It is observed that, it is essential to design career counseling and psycho therapeutic interventions to mitigate personality loss among graduate workers in organizations

Keywords: Generation Z, Educated Unemployment, Psychological Stress, Big Five Personality Traits, Neuroticism.



Improving Civic Literacy and Academic Engagement: Evaluating the Effect of Jigsaw Cooperative Learning Method on 11th-Grade Political Science Students

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Abstract:

Traditional methods of rote memorization used in teaching social sciences in secondary schools do not help in enabling digital natives to actively participate in the process of learning. The main aim of the study is to compare Jigsaw cooperative learning method with traditional lecture-based teaching methods in terms of its effectiveness in improving the academic performance, critical thinking, and civic skills of the students of 11th-grade, (political science). The study has a quasi-experimental pre-test/post-test control group design that took place over a 10-week period. A purposive sample of 120 students from two secondary schools was made. Students were divided into experimental group ($n = 60$), taught using the Jigsaw II model of cooperative learning and control group ($n = 60$) that received regular instruction.

In this study, participants completed the Political Science Achievement Test (PSAT) and the California Critical Thinking Skills Test (CCTST). Descriptive statistics and t-test for Independent Samples and ANOVA were used to analyze quantitative data. The p significance level was maintained at $p < 0.05$. The group of students subjected to the Jigsaw intervention saw significant improvement in their academic performance while receiving higher scores ($F(1, 117) = 18.42, p < 0.001, \beta_{p2} = 0.136$) for critical thinking after the program than the group that did not undergo the Jigsaw intervention. In addition, peer-assisted teaching also led to a remarkable decrease of the indifference to studying and higher skill of retention of knowledge from the difficult political theory courses. The use of the Jigsaw method for developing higher order thinking skills in the curriculum referred to in the paper is based on findings from research studies.

Keywords: Jigsaw method, Cooperative learning, Social studies curriculum, Grade 11, Academic success, Critical thinking skills.

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Synthetic Empathy: The Psychological and Social Implications of AI Companionship on Human Relational Development

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Abstract:

Conversational AI, large language models that feel unnervingly real, and autonomous agents built to seem human — all of this has changed how people interact with each other, and it happened faster than most of us expected. AI companionship used to be a science-fiction premise. Now it's a virtual romantic partner, a wellness chatbot, a mental-health app that talks back ordinary enough that it barely raises eyebrows anymore. What makes all of this work is something we might call “synthetic empathy”: a system's ability to simulate emotional attunement, active listening, and responsiveness that feels understanding even though nothing behind it actually understands. It gives people hyper-personalized, judgment-free attention on demand. It also raises harder questions than most of its users probably stop to ask. This paper looks at what happens when people form lasting attachments to these systems psychologically, relationally, and at the level of society more broadly.

Start with the psychological angle. AI companionship shows up right where a real public-health problem already exists: loneliness, isolation, people who are emotionally worn thin. These systems run on natural language processing and sentiment analysis, adjusting on the fly to whatever emotional state a user is in. For someone dealing with social anxiety, old attachment wounds, or just geographic isolation, that can genuinely function as a kind of safe space somewhere to say things without risking rejection, an argument, or judgment. The instant validation these systems are built to provide can calm anxiety in the moment and offer a real, if partial, tool for managing emotion.

But that same quality is also the problem. Human relationships involve friction disagreement, unpredictability, the work of setting boundaries with someone who has their own needs. Synthetic empathy has none of that built in. It runs one direction, bends to whatever the user wants, and never pushes back. Lean on that too long and it can quietly train someone toward emotional passivity toward expecting the kind of frictionless validation a machine gives, and losing patience for the version that requires effort, compromise, or hurt feelings, which is to say: the real version.

That has consequences for how people develop relationally, too. Skills like emotional resilience, working through conflict, actually seeing someone else's point of view these don't come from comfort. They come from practice, often uncomfortable practice, especially during the years when people are still forming how they relate to others. If synthetic validation starts replacing that discomfort instead of supplementing it, the incentive to build those harder skills just isn't there anymore. Attachment research suggests AI companions tend to push people toward anxious or avoidant relational patterns not because the AI is malicious, but because it's always available and never asks anything back. People can slide into what amounts to frictionless intimacy, and the skills that would let them read a hesitant pause, tolerate not knowing where they stand, or navigate the give-and-take of a real relationship start to atrophy. Instead of easing someone back toward real-world connection, the companion often becomes the whole relationship, and withdrawal from everything else deepens.

Zoom out further and there's a societal dimension too. Empathy isn't something people are simply born with and keep regardless of use it's more like a muscle, built through actual shared vulnerability and participation in a community. If people increasingly get their emotional needs met by an algorithm, the motivation to show up for neighbors, institutions, and the slower work of civic life starts to fade. Public life risks splintering into smaller, more isolated emotional bubbles, each person cared for individually and disconnected from everyone else. And underneath all of this sits a harder ethical problem: these platforms are commercial products, built to keep people engaged, which means the companies behind them have enormous influence over people's emotional vulnerabilities, their self-esteem, and the choices they make often without much oversight.

So where does that leave things? Synthetic empathy is a real turning point in how humans and AI are shaping each other. These systems clearly offer something comfort, a non-judgmental space, real short-term relief for people who are isolated. But if they become the main way people meet, understand, and support each other, something in our capacity for the real thing likely erodes. Handling that well is going to take more than good intentions: real psychological research, ethical design standards, better digital literacy, and some form of regulatory oversight. The goal shouldn't be to eliminate these tools it should be making sure they stay a bridge toward human connection, not a replacement for the messy, demanding, genuinely necessary work of being close to another person.

Keywords: Psychological, Social, AI, Human, loneliness

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AI and Human Creativity: A Balance between Efficiency and Artistic Values

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Abstract:

Having gained a space for the implementation, creating and experimenting art the ease and swiftness brought into art by Artificial Intelligence is unprecedented and affordable. Moreover it enables and eases access and hence democratises it. Artistry thus is forced into dilemma – efficiency in opposition to values of craftsmanship, authenticity, originality amongst human concepts of artistry. Ultimately, AI must not be replaced from human intention; rather it must be looked at as tool for a creative augmentation.

Democratization of art today, the arts are neither only the remit of classically trained individuals, nor are their possibilities confined to the use of traditional tools. Art has recently found fertile ground and endless explorations through Artificial Intelligence (AI) for all– anyone can visualize their own thoughts and concepts they previously thought themselves incapable of generating due to limitations of budget, materials, and a lack of formal art training. In a parallel trajectory, AI also enables unprecedented possibilities for ‘art-making collaboration’ between humans and intelligent machines. The tension between efficiency and craftsmanship Efficiency is found in contrast to the values of craftsmanship, authenticity, originality etc which AI seems to contribute towards. It appears to the observer to be in all aspects in part, but can we simply translate AI’s efficiency at producing an image, piece of music, or written work without considering the labor behind traditional art production?

Emotional and cultural value of human creativity beyond this we also face questions about what value we place on human creativity. Does the knowledge of the human element imbue a work with greater significance than its AI generated counterpart? Are individual failures, struggles and artistic interpretations the basis upon which artwork gains value? It doesn’t seem to be the criteria to measure creativity purely on the speed in which it was produced.

Therefore, the question isn’t simply if AI can create art; it is how do we, as a society, approach defining artistic value in the presence of artificial machines. AI cannot replace human intention, aesthetic judgment, emotional experience, or cultural value. It can, nonetheless, be employed as tools for creative augmentation – extending the horizons of possibility for human-creative projects rather than reducing our conception of creative practice to efficiency in content generation.

Keywords: Artificial Intelligence, Human Creativity, Artistic Values, Craftsmanship, Creative Augmentation, Democratisation of Art.



AI and the Transformation of Society, Culture, and Human Behaviour

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Abstract:

AI is no longer new to human realm -it is reshaping the way humans live, interact and think. AI has become partner in daily life, transforming society, culture, and human behaviour in profound ways. Transformation of Society - According to nature medicine 2019 study artificial intelligence diagnostic system has achieved around 95 percent accuracy in detecting breast cancer which was a huge achievement. There was one more report given by industries report which indicate that AI provide us revolutionary opportunities by reducing drug discovery timeliness by up to 70% In healthcare, AI is helping doctors find diseases early. Beyond health care AI transform education through personalized learning apps that help student learning better. In governance, data-driven policies enhance decision-making. Society is becoming increasingly dependent on AI, which brings opportunities but also problems like job loss and ethical questions.

Impact on Culture- Technological advancement is changing our culture. Now technology drives culture and ai is its latest frontier. Many sectors such as music, films, and art are being created by using AI tools, blending human creativity with machine intelligence. Social media algorithms decide what become popular. They shape cultural trends, influence what people watch, read, and talk about. This gives everyone a chance to create, but it also raises concern about what is original and real. UNESCO's 2025 report also emphasized that ai should be treated as a complementary tool to human creators rather than as a threat.

Shaping Human Behaviour- AI changes human behaviour by shifting how we interact with each other, make decisions and feel emotions. People have started depending on chatbots so they no longer need otherfor suggestion or communication which has reduce their loneliness but sometime they do many wrong things because of these chatbots So artificial Intelligence should be utilized in responsible and ethical manner that ensures it does not cause any harm.

Keywords: Healthcare, Governance, Culture, Machine Intelligence, Human Behaviour



The Analytical Study of English-Speaking Anxiety in Senior Secondary School Students

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Abstract:

Language anxiety is the most common widespread concern in the language learning process. English speaking Anxiety refers to any kind of language anxiety. It is the fear, nervousness, or discomfort experienced by the learners during oral communication in English. A significant proportion of Indian students of senior secondary level particularly from rural background experience anxiety in classroom discussions, giving presentation, attending group discussions. The objective of this research is to find out -the present scenario of English-speaking Anxiety among senior secondary students in Jaipur; Major causes of English-speaking Anxiety; The level of anxiety between government rural and private students; the difference in ESA between Male and female students; the relationships between English speaking Anxiety and academic performance.

Research Design:

$H_{01} \rightarrow$ Independent t-test (Male V/s Female)

$H_{02} \rightarrow$ Independent t-test (Govt. V/s Private)

$H_{03} \rightarrow$ Pearson Product Moment correlation (ESA score $\times$ English Academic score)

Sample Size:

200 students (100 Male + 100 Female)

[Containing 100 Govt. school students + 100 private school students]

Statistical Tools:

- Descriptive statistics: Mean, Standard Deviation, Percentage - to describe & analyse ESA level and distribution.
- H_{01} - Independent t-test: The difference of the score of English-speaking Anxiety Questionnaire between Male and Female students.
- H_{02} - Independent t-test: The difference of the score of ESAQ between Govt. and Private students.
- H_{03} - Pearson Product Moment: The relationship between ESAQ Total score & English Academic score.
- One Way ANOVA: The comparison of ESA across class 11th and 12th students.

Key Findings:

- English speaking anxiety is more common in Govt. school than public school.
- Female students are more nervous in speaking English rather than boys.
- English speaking anxiety affects negatively their academic performance.

Keywords: Language, Anxiety, Government, Rural, Private Students



जलवायु परिवर्तन को कम करने में नवीकरणीय ऊर्जा की भूमिका के प्रति उच्च माध्यमिक स्तर के विद्यार्थियों की जागरूकता का अध्ययन

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सारांश:

जलवायु परिवर्तन वर्तमान समय की सबसे गंभीर वैश्विक चुनौतियों में से एक है, जिसका पर्यावरण, पारिस्थितिकी और मानव जीवन पर प्रत्यक्ष प्रभाव पड़ रहा है। इस समस्या के समाधान हेतु पारंपरिक ऊर्जा स्रोतों के स्थान पर नवीकरणीय ऊर्जा (सौर, पवन, जल ऊर्जा आदि) के उपयोग को बढ़ावा देना अत्यंत आवश्यक है। उच्च माध्यमिक स्तर के विद्यार्थी देश के भावी नागरिक और कर्णधार हैं, अतः उनमें पर्यावरण संरक्षण और सतत विकास के प्रति सोच विकसित करना अनिवार्य है। नवीकरणीय ऊर्जा की भूमिका और जलवायु परिवर्तन को कम करने में इसके महत्व के प्रति विद्यार्थियों की जागरूकता का आकलन करना इस अध्ययन का मुख्य उद्देश्य है।

प्रस्तुत अध्ययन में सर्वेक्षण विधि Survey Method का प्रयोग किया गया है। अध्ययन की जनसंख्या हेतु कुल 120 उच्च माध्यमिक स्तर के विद्यार्थियों का चयन प्रतिदर्श (Sample) के रूप में किया गया है। डेटा संग्रहण हेतु शोधार्थी द्वारा एक स्व-निर्मित वस्तुनिष्ठ जागरूकता प्रश्नावली (Self-Constructed Awareness Questionnaire) का उपयोग किया गया है। एकत्रित आंकड़ों के विश्लेषण हेतु मध्यमान, मानक विचलन, ज.जमेज और प्रतिशत जैसी सांख्यिकीय विधियों का उपयोग किया गया है।

परिणाम एवं चर्चा: अध्ययन के माध्यम से यह विश्लेषण किया गया है कि उच्च माध्यमिक स्तर के विद्यार्थियों में जलवायु परिवर्तन के कारणों और इसे कम करने में नवीकरणीय ऊर्जा के महत्व के प्रति जागरूकता का स्तर क्या है। यह अध्ययन स्पष्ट करेगा कि विद्यार्थियों में पर्यावरणीय मुद्दों की समझ और सौर/पवन ऊर्जा जैसे विकल्पों की व्यावहारिक उपयोगिता के बारे में कितना ज्ञान और सकारात्मक दृष्टिकोण मौजूद है।

निष्कर्ष: यह शोध स्पष्ट करता है कि विद्यार्थियों में पर्यावरणीय चेतना और नवीकरणीय ऊर्जा के प्रति जागरूकता विकसित करने के लिए विद्यालयी स्तर पर किस प्रकार के प्रयास आवश्यक हैं। यह अध्ययन भविष्य में पाठ्यचर्या निर्माण, पर्यावरणीय शिक्षा कार्यक्रमों और सतत विकास हेतु जागरूकता अभियानों को प्रभावी बनाने के लिए एक मार्गदर्शक दस्तावेज़ के रूप में कार्य गया है।

मुख्य शब्द: जलवायु परिवर्तन, नवीकरणीय ऊर्जा, जागरूकता, उच्च माध्यमिक विद्यार्थी।

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उच्च माध्यमिक स्तर के विद्यार्थियों में करियर परामर्श कार्यक्रमों की प्रभावशीलता का अध्ययन

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सांराश:

शिक्षा व्यक्ति के सर्वांगीण विकास का मूल आधार होती है। उच्च माध्यमिक स्तर (11वीं एवं 12वीं कक्षा) विद्यार्थियों के जीवन का एक अत्यंत संवेदनशील और निर्णायक मोड़ होता है, जहाँ लिए गए शैक्षिक एवं व्यावसायिक निर्णय उनके भविष्य, आजीविका और सामाजिक प्रतिष्ठा की दिशा तय करते हैं। वर्तमान प्रतिस्पर्धात्मक और तकनीकी युग में विभिन्न करियर विकल्पों की बहुलता, उचित मार्गदर्शन का अभाव और अनभिज्ञता के कारण विद्यार्थियों में करियर चयन को लेकर असमंजस, अनिर्णय और मानसिक तनाव देखा जाता है। विद्यालयी स्तर पर संचालित करियर परामर्श कार्यक्रम विद्यार्थियों को उनकी व्यक्तिगत अभिरुचि, अभिक्षमता, कौशल और प्राथमिकताओं के अनुरूप सही दिशा चुनने में वैज्ञानिक मार्गदर्शन प्रदान करते हैं। प्रस्तुत शोध जयपुर जिले के उच्च माध्यमिक स्तर के विद्यार्थियों में ऐसे करियर परामर्श कार्यक्रमों की प्रभावशीलता और उनकी करियर परिपक्वता का आकलन करने का एक वैज्ञानिक प्रयास होगा।

प्रस्तुत अध्ययन में सर्वेक्षण विधि का प्रयोग किया गया है। अध्ययन की जनसंख्या हेतु राजस्थान राज्य के जयपुर जिले के कुल 200 उच्च माध्यमिक विद्यार्थियों का चयन न्यादर्श के रूप में किया गया है, जिसमें 100 छात्र तथा 100 छात्राएँ शामिल किये गये हैं। डेटा संग्रहण हेतु शोधार्थी द्वारा एक स्व-निर्मित वस्तुनिष्ठ प्रश्नावली का उपयोग किया जाएगा। एकत्रित आंकड़ों के विश्लेषण हेतु माध्य, मानक विचलन और प्रतिशत जैसी सांख्यिकीय विधियों का उपयोग किया जाएगा।

परिणाम और चर्चा: अध्ययन के माध्यम से यह विश्लेषण किया जाएगा कि जयपुर जिले के उच्च माध्यमिक स्तर के विद्यार्थियों में करियर परामर्श कार्यक्रमों के उपरांत करियर जागरूकता, लक्ष्य निर्धारण, निर्णय लेने के आत्मविश्वास और करियर परिपक्वता का वास्तविक स्तर क्या किया गया है। यह अध्ययन स्पष्ट करता है कि क्या विद्यार्थियों को पारंपरिक करियर विकल्पों की ही जानकारी है या आधुनिक

उभरते क्षेत्रों के प्रति भी व्यावहारिक समझ विकसित हुई है। यह शोध छात्र एवं छात्राओं (जेंडर) के आधार पर करियर परामर्श की प्रभावशीलता में अंतर को भी स्पष्ट करेगा।

निष्कर्ष: यह शोध स्पष्ट करता है कि किस प्रकार उच्च माध्यमिक स्तर पर सुव्यवस्थित व वैज्ञानिक करियर परामर्श कार्यक्रमों के माध्यम से विद्यार्थियों की निर्णय क्षमता और करियर स्पष्टता में सकारात्मक संवर्धन किया जा सकता है। यह अध्ययन भविष्य की शैक्षिक नीतियों, विद्यालयी स्तर पर करियर गाइडेंस प्रकोष्ठों की स्थापना तथा पाठ्यक्रम निर्माण में सुधार करके विद्यार्थियों को आत्मनिर्भर व सशक्त बनाने हेतु एक मार्गदर्शक दस्तावेज़ के रूप में कार्य करेगा।

मुख्य शब्द: करियर परामर्श कार्यक्रम, प्रभावशीलता, उच्च माध्यमिक विद्यार्थी, छात्र एवं छात्राएँ, जयपुर जिला।

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उच्च माध्यमिक स्तर के विद्यार्थियों की शैक्षिक उपलब्धि पर ऑनलाइन शिक्षण प्लेटफॉर्म के प्रभाव का अध्ययन

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सारांश:

शिक्षा समाज और मानव विकास का मूल आधार है। वर्तमान डिजिटल युग में पारंपरिक शिक्षण विधियों के साथ-साथ डिजिटल शिक्षण और ऑनलाइन प्लेटफॉर्मों ने शिक्षा प्रणाली में एक महत्वपूर्ण बदलाव लाया है। उच्च माध्यमिक स्तर के विद्यार्थियों के जीवन में यह चरण उनके शैक्षणिक और करियर निर्माण के दृष्टिकोण से अत्यंत संवेदनशील होता है। ऑनलाइन शिक्षण प्लेटफॉर्मों विद्यार्थियों के ज्ञान-अर्ज, स्व-अध्ययन क्षमता और शैक्षिक प्रदर्शन को किस प्रकार प्रभावित करते हैं, इसका आकलन करना आवश्यक है। यह शोध उच्च माध्यमिक स्तर के विद्यार्थियों की शैक्षिक उपलब्धि पर ऑनलाइन शिक्षण प्लेटफॉर्मों के वास्तविक प्रभाव का मूल्यांकन करने का एक वैज्ञानिक प्रयास है।

कार्यपद्धति : प्रस्तुत अध्ययन में सर्वेक्षण विधि का प्रयोग किया जाएगा। अध्ययन की जनसंख्या हेतु कुल 120 उच्च माध्यमिक स्तर के विद्यार्थियों का चयन प्रतिदर्श के रूप में किया जाएगा। डेटा संग्रहण हेतु शोधार्थी द्वारा एक स्व-निर्मित वस्तुनिष्ठ प्रश्नावली) एवं विद्यार्थियों के शैक्षिक प्राप्तांकों का उपयोग किया जाएगा। एकत्रित आंकड़ों के विश्लेषण हेतु मध्यमान, मानक विचलन का उपयोग किया जाएगा।

परिणाम एवं चर्चा : अध्ययन के माध्यम से यह विश्लेषण किया गया कि ऑनलाइन शिक्षण प्लेटफॉर्मों का उपयोग विद्यार्थियों की शैक्षिक उपलब्धि और सीखने की क्षमता को कितना सकारात्मक या नकारात्मक रूप से प्रभावित करता है। यह अध्ययन स्पष्ट करेगा कि डिजिटल संसाधनों की उपलब्धता और उपयोगिता से विद्यार्थियों के परीक्षा परिणामों एवं समझ के स्तर में क्या अंतर देखने को मिलता है।

निष्कर्ष: यह शोध स्पष्ट करता है कि डिजिटल और ऑनलाइन शिक्षण तकनीकें किस प्रकार उच्च माध्यमिक स्तर के विद्यार्थियों के शैक्षिक स्तर को उन्नत बनाने में सहायक सिद्ध हो सकती हैं। यह अध्ययन भविष्य में शैक्षिक नीतियों, पाठ्यक्रम निर्माण तथा ऑनलाइन शिक्षण पद्धतियों में आवश्यक सुधार करने हेतु एक मार्गदर्शक दस्तावेज़ के रूप में कार्य करती हैं।

मुख्य शब्द: ऑनलाइन शिक्षण प्लेटफॉर्म, शैक्षिक उपलब्धि, उच्च माध्यमिक विद्यार्थी, डिजिटल शिक्षा

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जयपुर जिले के सरकारी प्राथमिक विद्यालयों में निपुण भारत मिशन के क्रियान्वयन में चुनौतियाँ

दीपिका टैलर और मनीष सैनी

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सांराश:

राष्ट्रीय शिक्षा नीति 2020 के अंतर्गत प्रारम्भ किए गए निपुण भारत मिशन का उद्देश्य कक्षा 3 तक के सभी बच्चों में आधारभूत साक्षरता एवं संख्यात्मकता के लक्ष्यों को सन् 2026 तक प्राप्त करना है। वर्तमान अध्ययन जयपुर जिले के सरकारी प्राथमिक विद्यालयों में इस मिशन के क्रियान्वयन के दौरान उत्पन्न होने वाली चुनौतियों का विश्लेषण करने हेतु किया गया है। अध्ययन हेतु वर्णनात्मक सर्वेक्षण विधि का उपयोग किया गया। न्यादर्श में जयपुर जिले के सांगानेर एवं चाकसू ब्लॉक के 10 सरकारी प्राथमिक विद्यालयों से कुल 30 शिक्षकों का चयन उद्देश्यपूर्ण प्रतिचयन द्वारा किया गया। आंकड़ा संग्रह हेतु स्वनिर्मित प्रश्नावली का प्रयोग किया गया। एकत्रित आंकड़ों के विश्लेषण हेतु प्रतिशत, मध्यमान, मानक विचलन तथा विषयवस्तु विश्लेषण का उपयोग किया गया। प्रमुख निष्कर्ष में पाया कि शिक्षकों के अनुसार मिशन संबंधी प्रशिक्षण अपर्याप्त है। विद्यालयों में छात्र संख्या अधिक होने के कारण शिक्षण-अधिगम प्रभावी नहीं हो पा रहा है तथा विद्यालयों में शिक्षण-अधिगम सामग्री की कमी पाई गई।

मुख्य शब्द: निपुण भारत, आधारभूत साक्षरता एवं संख्यात्मकता, राष्ट्रीय शिक्षा नीति 2020, प्राथमिक शिक्षा, चुनौतियाँ

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मलीन बस्ती के बालकों की शारीरिक स्वच्छता का अध्ययन

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सारांश:

शारीरिक स्वच्छता व्यक्ति के स्वस्थ एवं संतुलित जीवन का एक महत्वपूर्ण आधार है। बाल्यावस्था में स्वच्छता संबंधी आदतों का विकास अत्यंत आवश्यक होता है, क्योंकि इसी अवस्था में बालकों में स्वास्थ्य, स्वच्छता एवं व्यक्तिगत देखभाल से संबंधित व्यवहार विकसित होते हैं। नियमित रूप से स्नान करना, हाथ-पैर एवं चेहरा साफ रखना, नाखून काटना, दाँतों की सफाई करना, स्वच्छ वस्त्र पहनना, बालों की सफाई रखना, भोजन से पूर्व एवं शौच के बाद हाथ धोना तथा स्वच्छ पेयजल का उपयोग करना शारीरिक स्वच्छता के प्रमुख घटक हैं। उचित शारीरिक स्वच्छता बालकों को अनेक संक्रामक रोगों से बचाने के साथ-साथ उनके शारीरिक विकास, मानसिक प्रसन्नता एवं विद्यालयी सहभागिता में भी सहायक होती है। मलीन बस्तियों में रहने वाले बालकों के लिए शारीरिक स्वच्छता का विषय विशेष महत्व रखता है। ऐसी बस्तियों में प्रायः स्वच्छ पेयजल, उचित शौचालय, कूड़ा निस्तारण, नालियों की व्यवस्था तथा स्वच्छ एवं सुरक्षित रहने के स्थान जैसी मूलभूत सुविधाओं का अभाव पाया जा सकता है। इसके अतिरिक्त परिवार की आर्थिक स्थिति, माता-पिता की शैक्षिक स्थिति, स्वच्छता के प्रति जागरूकता तथा आसपास का वातावरण भी बालकों की व्यक्तिगत स्वच्छता संबंधी आदतों को प्रभावित कर सकता है। इसलिए मलीन बस्ती के बालकों की शारीरिक स्वच्छता की वास्तविक स्थिति का अध्ययन करना शैक्षिक एवं सामाजिक दृष्टि से आवश्यक है। प्रस्तुत अध्ययन का मुख्य उद्देश्य मलीन बस्ती में रहने वाले बालकों की शारीरिक स्वच्छता के स्तर का अध्ययन करना है। अध्ययन में यह जानने का प्रयास किया गया है कि बालक व्यक्तिगत स्वच्छता की विभिन्न आदतों का किस सीमा तक पालन करते हैं तथा उनकी स्वच्छता की स्थिति को प्रभावित करने वाले प्रमुख कारक कौन-कौन से हैं। अध्ययन के अंतर्गत बालकों की स्नान संबंधी आदतें, हाथ धोने की आदत, दाँतों की सफाई, नाखूनों की स्वच्छता, बालों एवं वस्त्रों की सफाई, शौचालय के उपयोग की आदत तथा भोजन एवं पेयजल से संबंधित स्वच्छता व्यवहारों को प्रमुख आधार माना गया है।

प्रस्तुत शोध में वर्णनात्मक सर्वेक्षण विधि का प्रयोग किया गया है। अध्ययन की जनसंख्या में मलीन बस्तियों में निवास करने वाले विद्यालय जाने वाले बालकों को सम्मिलित किया गया है। निर्धारित जनसंख्या में से उपयुक्त प्रतिचयन विधि द्वारा चयनित बालकों को न्यादर्श के रूप में लिया गया है। आँकड़ों के संकलन हेतु शोधार्थी द्वारा तैयार की गई शारीरिक स्वच्छता मापनी/प्रश्नावली का प्रयोग किया गया है। उपकरण में बालकों की व्यक्तिगत स्वच्छता से संबंधित कथन रखे जाएंगे, जिनके आधार पर उनके स्वच्छता व्यवहार का मापन किया गया है। एकत्रित आँकड़ों का वर्गीकरण एवं विश्लेषण उचित सांख्यिकीय विधियों के माध्यम से किया गया है।

इस अध्ययन से यह परिणाम प्राप्त हुए कि मलीन बस्ती के बालकों की शारीरिक स्वच्छता की वास्तविक स्थिति के संबंध में उपयोगी जानकारी प्राप्त हुई। अध्ययन से यह भी स्पष्ट हुआ कि बालकों में विभिन्न स्वच्छता संबंधी आदतों का विकास अपेक्षाकृत अधिक हुआ है तथा कुछ क्षेत्रों में सुधार की आवश्यकता है। प्राप्त निष्कर्षों के आधार पर विद्यालय, शिक्षक, अभिभावक तथा स्थानीय संस्थाएँ बालकों में व्यक्तिगत स्वच्छता के प्रति जागरूकता उत्पन्न करने के लिए प्रभावी कार्यक्रम तैयार कर सकते हैं।

शारीरिक स्वच्छता केवल रोगों से बचाव का माध्यम नहीं है, बल्कि यह बालक के समग्र व्यक्तित्व विकास का भी महत्वपूर्ण आधार है। स्वस्थ एवं स्वच्छ बालक विद्यालयी गतिविधियों में अधिक सक्रिय रूप से भाग ले सकता है तथा उसके आत्मविश्वास एवं सामाजिक व्यवहार पर भी सकारात्मक प्रभाव पड़ता है। अतः मलीन बस्ती के बालकों में स्वच्छता संबंधी जागरूकता एवं व्यवहार को विकसित करने के लिए विद्यालय एवं समुदाय दोनों के स्तर पर निरंतर प्रयास किए जाना आवश्यक है। प्रस्तुत अध्ययन इसी दिशा में एक उपयोगी प्रयास है, जिसके माध्यम से मलीन बस्ती के बालकों की शारीरिक स्वच्छता की स्थिति को समझने तथा उसमें सुधार के लिए आवश्यक सुझाव प्रस्तुत करने का प्रयास किया जाएगा।

मुख्य शब्द: मलीन बस्ती, बालक, शिक्षक, अभिभावक, शारीरिक स्वच्छता, विद्यालय

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माध्यमिक स्तर के विद्यालयों में संस्कृत शिक्षण की समस्याएँ एवं समाधान : एक अध्ययन

रचना जैन और मीनाक्षी शर्मा

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अध्ययन का उद्देश्य और पृष्ठभूमि: राष्ट्रीय शिक्षा नीति 2020 द्वारा संस्कृत को विशेष महत्व दिए जाने के बावजूद, माध्यमिक स्तर पर इसके शिक्षण में कई बाधाएँ हैं। प्रस्तुत शोध का मुख्य उद्देश्य जयपुर जिले के माध्यमिक विद्यालयों में संस्कृत शिक्षण की वर्तमान स्थिति, शिक्षकों के समक्ष आने वाली चुनौतियों, विद्यार्थियों की अभिवृत्ति और शिक्षण सुधार हेतु व्यावहारिक सुझावों का विश्लेषणात्मक अध्ययन करना है।

शोध पद्धति : यह अध्ययन वर्णनात्मक सर्वेक्षण विधि पर आधारित है। जयपुर जिले के 180 प्रतिभागियों (60 संस्कृत शिक्षक और 120 विद्यार्थी) का चयन उद्देश्यपूर्ण एवं स्तरीकृत यादृच्छिक प्रतिचयन द्वारा किया गया है। डेटा संकलन हेतु स्वनिर्मित प्रश्नावलियों और मापनियों का उपयोग किया गया।

सांख्यिकीय उपकरण: प्राप्त आंकड़ों के विश्लेषण हेतु वर्णनात्मक सांख्यिकी (माध्य, मानक विचलन, प्रतिशत, आवृत्ति) तथा निष्कर्षात्मक सांख्यिकी के रूप में स्वतंत्र टी-परीक्षण का उपयोग किया जाएगा। गुणात्मक डेटा (सुझावों) के लिए थीमेटिक एनालिसिस प्रयुक्त किये गये हैं।

मुख्य परिणाम एवं निष्कर्ष: अध्ययन से यह निष्कर्ष प्राप्त होने की अपेक्षा है कि सरकारी और निजी विद्यालयों में संस्कृत शिक्षण की समस्याओं (जैसे— TLM का अभाव, पारंपरिक शिक्षण विधियाँ) में सार्थक अंतर है। पारंपरिक व्याकरण-अनुवाद विधि के कारण विद्यार्थियों में अरुचि देखी गई है। इस शोध के परिणाम संस्कृत शिक्षण को आधुनिक, रोचक और जीवन-उपयोगी बनाने हेतु नीति-निर्माताओं एवं शिक्षकों के लिए महत्वपूर्ण व्यावहारिक समाधान प्रस्तुत हैं।

मुख्य शब्द: संस्कृत शिक्षण, माध्यमिक स्तर, शिक्षण समस्याएँ, विद्यार्थी अभिवृत्ति, शिक्षण विधियाँ।

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उच्च माध्यमिक स्तर के विद्यार्थियों में आत्म-जागरूकता से उनकी शैक्षणिक गतिविधियों पर पड़ने वाले प्रभावों का अध्ययन

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सारांश:

शिक्षा का मूल उद्देश्य केवल सैद्धांतिक ज्ञान प्रदान करना ही नहीं, बल्कि विद्यार्थियों के व्यक्तित्व, भावनात्मक संतुलन एवं सर्वांगीण क्षमता का विकास करना है। आत्म-जागरूकता भावनात्मक बुद्धिमत्ता का एक अत्यंत महत्वपूर्ण घटक है, जिसके माध्यम से विद्यार्थी अपनी व्यक्तिगत क्षमताओं, सीमाओं, रुचियों तथा संवेगों को भली-भांति समझ पाते हैं। उच्च माध्यमिक स्तर किशोरावस्था का वह महत्वपूर्ण पड़ाव है जहाँ शैक्षणिक निर्णय और गतिविधियाँ विद्यार्थियों के भावी जीवन की दिशा निर्धारित करती हैं। उचित आत्म-बोध विद्यार्थियों के अध्ययन व्यवहार, समय प्रबंधन, कक्षा सहभागिता और शैक्षणिक उपलब्धियों को प्रत्यक्ष रूप से प्रभावित करता है। प्रस्तुत शोध जयपुर जिले के उच्च माध्यमिक स्तर के विद्यार्थियों में आत्म-जागरूकता और उनकी शैक्षणिक गतिविधियों के अंतरसंबंधों तथा प्रभावों का व्यवस्थित एवं वैज्ञानिक आकलन करने का एक प्रयास है।

प्रस्तुत अध्ययन में विवरणात्मक सर्वेक्षण विधि का प्रयोग किया गया। अध्ययन की जनसंख्या हेतु राजस्थान राज्य के जयपुर जिले के कुल 100 उच्च माध्यमिक विद्यार्थियों का चयन स्तरीकृत यादृच्छिक प्रतिचयन विधि द्वारा न्यादर्श के रूप में किया गया, जिसमें 50 ग्रामीण क्षेत्र तथा 50 शहरी क्षेत्र के विद्यार्थी (अथवा 50 छात्र व 50 छात्राएँ) शामिल थे। डेटा संग्रहण हेतु स्वनिर्मित/मानकीकृत आत्म-जागरूकता मापनी तथा शैक्षणिक गतिविधि अनुसूची का उपयोग किया गया। संकलित आंकड़ों के विश्लेषण हेतु मध्यमान, मानक विचलन, सहसंबंध, एवं प्रतिशत जैसी सांख्यिकीय विधियों का उपयोग किया गया।

परिणाम एवं चर्चा:

अध्ययन के माध्यम से यह विश्लेषण द्वारा कि विद्यार्थियों की आत्म-जागरूकता का स्तर उनकी नियमित शैक्षणिक गतिविधियों, गृहकार्य निष्पादन, परीक्षा तैयारी और सह-शैक्षणिक सहभागिता पर क्या सकारात्मक प्रभाव डालता है। यह अध्ययन के परिणामों से स्पष्ट हुआ कि क्या उच्च आत्म-जागरूकता वाले विद्यार्थी शैक्षणिक तनाव का प्रबंधन बेहतर ढंग से कर पाते हैं। इसके साथ ही ग्रामीण व शहरी पृष्ठभूमि तथा लिंग के आधार पर विद्यार्थियों के आत्म-बोध स्तर और उनकी शैक्षणिक गतिविधियों में पाए जाने वाले किसी भी सार्थक अंतर की विवेचना की गई।

निष्कर्ष:

निष्कर्षतः, यह शोध के परिणामों से स्पष्ट हुआ कि विद्यार्थियों में आत्म-जागरूकता का विकास किस प्रकार उनके शैक्षणिक निष्पादन एवं समग्र व्यक्तित्व को सुदृढ़ बनाने में सहायक होता है। यह अध्ययन शिक्षकों, मार्गदर्शकों और अभिभावकों को विद्यार्थियों के आत्म-बोध को बढ़ाने तथा विद्यालयी स्तर पर

अनुकूल एवं सकारात्मक शैक्षणिक वातावरण के निर्माण हेतु एक उपयोगी मार्गदर्शक दस्तावेज के रूप में कार्य करेगा।

मुख्य शब्द: आत्म-जागरूकता, शैक्षणिक गतिविधियाँ, उच्च माध्यमिक स्तर के विद्यार्थी, जयपुर जिला, किशोरावस्था

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विद्यार्थियों की सीखने की शैलियों पर सामाजिक एवं आर्थिक स्थिति के प्रभाव का अध्ययन

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पृष्ठभूमि: प्रत्येक विद्यार्थी की सीखने की क्षमता और तरीका भिन्न होता है, जिसे सीखने की शैली कहा जाता है। विद्यार्थियों की व्यक्तिगत शिक्षण आवश्यकताओं और प्राथमिकताओं को निर्धारित करने में उनकी सामाजिक एवं आर्थिक स्थिति महत्वपूर्ण भूमिका निभाती है। पारिवारिक पृष्ठभूमि, संसाधनों की उपलब्धता, अभिभावकों का शिक्षा स्तर और आर्थिक स्थिति विद्यार्थियों के अध्ययन वातावरण को गहराई से प्रभावित करती है। यह शोध यह जानने का एक वैज्ञानिक प्रयास है कि विभिन्न सामाजिक एवं आर्थिक पृष्ठभूमि से आने वाले विद्यार्थियों की सीखने की शैलियों में क्या अंतर या प्रभाव देखने को मिलता है।

कार्यपद्धति: प्रस्तुत अध्ययन में सर्वेक्षण विधि का प्रयोग किया गया। अध्ययन की जनसंख्या हेतु कुल 120 विद्यार्थियों का चयन प्रतिदर्श के रूप में किया गया। डेटा संग्रहण हेतु शोधार्थी द्वारा एक स्व-निर्मित वस्तुनिष्ठ सामाजिक-आर्थिक स्थिति मापनी एवं सीखने की शैली निर्धारण प्रश्नावली का उपयोग किया गया। एकत्रित आंकड़ों के विश्लेषण हेतु मध्यमान, मानक विचलन S-D & t-test और प्रतिशत जैसी सांख्यिकीय विधियों का उपयोग किया गया।

परिणाम एवं चर्चा: अध्ययन के माध्यम से यह विश्लेषण किया गया कि उच्च, मध्यम एवं निम्न सामाजिक-आर्थिक स्तर के विद्यार्थियों की सीखने की शैलियों (दृश्य, अव्य, या व्यावहारिक) में कोई सार्थक अंतर है। यह अध्ययन के आर्थिक एवं सामाजिक संसाधन विद्यार्थियों की सीखने के प्रति रुचि और उनकी अधिगम शैलियों को प्रभावित करते हैं।

निष्कर्ष: यह शोध के परिणामों से स्पष्ट हुआ कि विद्यार्थियों की विविध सामाजिक-आर्थिक पृष्ठभूमि को ध्यान में रखते हुए शिक्षण विधियों और अधिगम वातावरण को किस प्रकार समावेशी बनाया जा सकता है। यह अध्ययन भविष्य में अध्यापकों, पाठ्यचर्या निर्माताओं तथा शैक्षिक सलाहकारों के लिए एक मार्गदर्शक दस्तावेज के रूप में कार्य करेगा।

मुख्य शब्द: सीखने की शैली, सामाजिक-आर्थिक स्थिति, विद्यार्थी, अधिगम वातावरण

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वसुधैव कुटुम्बकम्: शिक्षा से वैश्विक नागरिकता की ओर

तनवी भट्ट और सुनीता कुमारी शर्मा

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सारांश: 'वसुधैव कुटुम्बकम्' भारतीय ज्ञान परंपरा की वह व्यापक जीवन-दृष्टि है, जो सम्पूर्ण विश्व को एक परिवार के रूप में देखने की प्रेरणा देती है। वर्तमान वैश्विक परिदृश्य में वैश्वीकरण, तकनीकी विकास, सांस्कृतिक विविधता, पर्यावरणीय संकट और सामाजिक असमानताएँ शिक्षा के उद्देश्यों को व्यापक बनाने की आवश्यकता को रेखांकित करती हैं। प्रस्तुत अध्ययन का उद्देश्य 'वसुधैव कुटुम्बकम्' की अवधारणा और वैश्विक नागरिकता शिक्षा के बीच वैचारिक संबंध का विश्लेषण करना तथा शिक्षा की भूमिका को स्पष्ट करना है।

अध्ययन वर्णनात्मक एवं विश्लेषणात्मक शोध-पद्धति पर आधारित है तथा इसमें द्वितीयक स्रोतों का उपयोग किया गया है। शोध के उपकरण के रूप में दस्तावेज़ विश्लेषण एवं विषय-वस्तु विश्लेषण को अपनाया गया है। अध्ययन हेतु भारतीय ज्ञान परंपरा से संबंधित प्रामाणिक ग्रंथों, राष्ट्रीय शिक्षा नीति 2020, न्छैम्ब की वैश्विक नागरिकता शिक्षा संबंधी रिपोर्टें तथा संबंधित पुस्तकों और शोध-पत्रों का चयनात्मक अध्ययन किया गया।

अध्ययन से स्पष्ट होता है कि 'वसुधैव कुटुम्बकम्' की मानवीय एवं समावेशी दृष्टि आधुनिक वैश्विक नागरिकता शिक्षा को मूल्यपरक आधार प्रदान कर सकती है। शिक्षा के माध्यम से विद्यार्थियों में सहिष्णुता, समानता, सहयोग, मानवाधिकारों के प्रति सम्मान, सांस्कृतिक संवेदनशीलता, पर्यावरणीय चेतना तथा सामाजिक उत्तरदायित्व का विकास किया जा सकता है। अतः भारतीय ज्ञान परंपरा और आधुनिक शिक्षा-दृष्टि का समन्वय विद्यार्थियों में 'स्व' से 'समष्टि' तथा 'स्थानीय' से 'वैश्विक' की ओर सोच विकसित करने में सहायक हो सकता है।

मुख्य शब्द: वसुधैव कुटुम्बकम्, वैश्विक नागरिकता, मूल्य शिक्षा, भारतीय ज्ञान परंपरा, दस्तावेज़ विश्लेषण, विषय-वस्तु विश्लेषण, वैश्विक नागरिकता शिक्षा।

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उच्च शिक्षण संस्थानों के प्रशासनिक कर्मचारियों का पेपरलेस कार्यप्रणाली के प्रति दृष्टिकोण का अध्ययन

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सारांश: आधुनिक युग में सूचना एवं संचार प्रौद्योगिकी के तीव्र विकास ने शैक्षणिक संस्थानों की प्रशासनिक कार्यप्रणाली को पूरी तरह बदल दिया है। उच्च शिक्षण संस्थानों में कार्यकुशलता, पारदर्शिता, समय की बचत और पर्यावरण संरक्षण को बढ़ावा देने के लिए ई-ऑफिस, प्रबंधन सूचना प्रणाली, तथा एंटरप्राइज रिसोर्स प्लानिंग जैसी पेपरलेस तकनीकों का समावेश तेजी से किया जा रहा है। राष्ट्रीय

शिक्षा नीति 2020 भी शैक्षणिक एवं प्रशासनिक प्रक्रियाओं के डिजिटलीकरण पर विशेष जोर देती है। हालाँकि, किसी भी तकनीकी परिवर्तन की सफलता मुख्य रूप से उसे लागू करने वाले जनशक्ति के दृष्टिकोण और स्वीकार्यता पर निर्भर करती है। उच्च शिक्षण संस्थानों के गैर-शैक्षणिक प्रशासनिक कर्मचारी इस पूरी प्रक्रिया की मुख्य रीढ़ हैं। अतः यह अध्ययन जयपुर जिले के उच्च शिक्षण संस्थानों में कार्यरत प्रशासनिक कर्मचारियों के पेपरलेस कार्यप्रणाली के प्रति दृष्टिकोण, उनकी कार्य-संतुष्टि, व्यावहारिक अनुभवों, तथा प्रणाली को पूर्णतः लागू करने में आने वाली तकनीकी चुनौतियों एवं बाधाओं का बहुआयामी व वैज्ञानिक अध्ययन करने का एक सार्थक प्रयास है।

कार्यविधि : प्रस्तुत शोध अध्ययन में वर्णनात्मक सर्वेक्षण विधि तथा मात्रात्मक एवं गुणात्मक मिश्रित शोध उपागम का प्रयोग किया जाएगा। अध्ययन की जनसंख्या राजस्थान राज्य के जयपुर जिले के उच्च शिक्षण संस्थानों में कार्यरत समस्त प्रशासनिक कर्मचारी होंगे। अध्ययन हेतु सरल यादृच्छिक न्यादर्श पद्धतिद्वारा जयपुर जिले के उच्च शिक्षण संस्थानों से 50 गैर-शैक्षणिक प्रशासनिक कर्मचारियों का चयन किया जाएगा। डेटा संग्रहण हेतु शोधकर्त्री द्वारा निर्मित 3 मुख्य शोध उपकरणों का उपयोग किया जाएगा: 1. स्व-निर्मित प्रश्नावली: 40-पदों की त्रि-बिंदु मापक्रम प्रश्नावली (वर्तमान उपयोग, प्रभावशीलता, तकनीकी चुनौतियाँ, तथा दृष्टिकोण आयामों पर आधारित)। 2. साक्षात्कार अनुसूची: कर्मचारियों के व्यक्तिगत अनुभवों और व्यावहारिक कठिनाइयों की गहन गुणात्मक जानकारी हेतु अर्ध-संरचित अनुसूची। 3. दस्तावेज विश्लेषण प्रारूप: संस्थान में लागू डिजिटल/पेपरलेस प्रणाली एवं तकनीकी अवसंरचना की वस्तुस्थिति के सत्यापन हेतु। एकत्रित मात्रात्मक आंकड़ों का विश्लेषण माध्य, मानक विचलन तथा प्रतिशत विधि द्वारा किया जाएगा। गुणात्मक व मात्रात्मक निष्कर्षों के मिलान हेतु बहु-उपकरण त्रिकोणीकरण के माध्यम से परिणामों की विश्वसनीयता और वैधता सुनिश्चित की जाएगी।

परिणाम: अध्ययन के माध्यम से यह विश्लेषण किया जाएगा कि प्रशासनिक कर्मचारियों में पेपरलेस कार्यप्रणाली के प्रति स्वीकार्यता का स्तर (निम्न, मध्यम या उच्च) क्या है और इसमें कौन से कारक बाधक या सहायक हैं। पूर्व अध्ययनों एवं प्राथमिक अवलोकनों के आधार पर यह स्पष्ट होने की संभावना है कि पेपरलेस प्रणाली के उपयोग से समय और कागजी कार्यवाही में भारी कमी आती है तथा कार्य-प्रभावशीलता बढ़ती है। हालाँकि, पर्याप्त तकनीकी प्रशिक्षण का अभाव, सर्वर व नेटवर्क संबंधी बाधाएं, डेटा सुरक्षा की चिंताएं तथा पारंपरिक कागजी आदतें कर्मचारियों के मन में झिझक या नकारात्मक दृष्टिकोण पैदा करती हैं। मात्रात्मक प्राप्तांकों और गुणात्मक साक्षात्कारों के सम्मिश्रण से कर्मचारियों की वास्तविक समस्याओं का गहराई से पता लगाया जा सकेगा।

निष्कर्ष : उच्च शिक्षण संस्थानों में पेपरलेस कार्यप्रणाली को केवल तकनीकी सॉफ्टवेयर स्थापित करके पूरी तरह सफल नहीं बनाया जा सकता, बल्कि इसके लिए कर्मचारियों के दृष्टिकोण में सकारात्मक बदलाव लाना और उन्हें सहज बनाना अत्यंत आवश्यक है। यह शोध यह स्पष्ट करेगा कि किस प्रकार नियमित तकनीकी प्रशिक्षण, बेहतर आईटी अवसंरचना और संस्थागत प्रोत्साहन के माध्यम से प्रशासनिक कर्मचारियों को डिजिटल परिवर्तन के लिए प्रेरित किया जा सकता है। यह अध्ययन भविष्य में नीति-निर्माताओं, शिक्षण संस्थानों के प्रशासकों और आईटी-संयोजकों के लिए एक प्रभावी मार्गदर्शक दस्तावेज के रूप में कार्य करेगा।

मुख्य शब्द: पेपरलेस कार्यप्रणाली, प्रशासनिक कर्मचारी, ई-ऑफिस, कर्मचारियों का दृष्टिकोण, उच्च शिक्षण संस्थान



उच्च माध्यमिक स्तर के विद्यार्थियों में संवैधानिक मूल्यों के प्रति जागरूकता का अध्ययन

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सारांश: शिक्षा मात्र साक्षरता नहीं, बल्कि मनुष्य में विवेक जगाकर उसे एक जागरूक नागरिक बनाने का माध्यम है। शिक्षा और संविधान एक ही सिक्के के दो पहलू हैं। भारतीय संविधान की उद्देशिका राष्ट्र की आत्मा है, जिसमें न्याय, स्वतंत्रता, समानता और बंधुता जैसे मूल्य समाहित हैं। डॉ. बी.आर. अंबेडकर के अनुसार, संविधान केवल एक कानूनी दस्तावेज नहीं, बल्कि जीवन जीने का माध्यम है। राष्ट्रीय शिक्षा नीति (छम्ह) 2020 भी विद्यार्थियों में संवैधानिक मूल्यों के प्रति गौरव विकसित करने पर जोर देती है। वर्तमान में माध्यमिक स्तर (किशोरावस्था) के विद्यार्थियों में संवैधानिक अधिकारों का बौद्धिक ज्ञान तो है, किंतु व्यावहारिक आचरण और 'मूल्य संकट' का अध्ययन करना आवश्यक था। यह शोध सीकर जिले के उच्च माध्यमिक विद्यार्थियों की इसी संवैधानिक जागरूकता का आकलन करने का एक वैज्ञानिक प्रयास था।

कार्यपद्धति: प्रस्तुत अध्ययन में वर्णनात्मक सर्वेक्षण विधि और मिश्रित शोध उपागम का प्रयोग किया गया। अध्ययन की जनसंख्या राजस्थान राज्य के सीकर जिले के समस्त उच्च माध्यमिक स्तर (कक्षा 11वीं) के विद्यार्थी थे। स्तरीय यादृच्छिक प्रतिचयन विधि के माध्यम से कुल 150 विद्यार्थियों का चयन किया गया, जिसमें ग्रामीण और शहरी दोनों क्षेत्रों तथा कला, विज्ञान और वाणिज्य संकायों का संतुलित प्रतिनिधित्व सुनिश्चित किया गया था। डेटा संग्रहण हेतु शोधार्थी द्वारा एक स्व-निर्मित वस्तुनिष्ठ प्रश्नावली का उपयोग किया गया। एकत्रित आँकड़ों के विश्लेषण हेतु माध्य, मानक विचलन S-D test, t-test, ANOV। और प्रतिशत जैसी सांख्यिकीय विधियों का उपयोग किया गया।

परिणाम और चर्चा: अध्ययन के माध्यम से यह विश्लेषण किया गया कि विभिन्न संकायों (कला, विज्ञान, वाणिज्य) और क्षेत्रों (ग्रामीण और शहरी दोनों क्षेत्रों) के विद्यार्थियों ने संवैधानिक मूल्यों (समानता, स्वतंत्रता, न्याय, बंधुता) की वास्तविक समझ और उनके व्यावहारिक अनुप्रयोग का स्तर क्या दर्शाया। पूर्व अध्ययनों के आधार पर यह स्पष्ट हुआ कि विद्यार्थियों को किताबी ज्ञान तो है, किंतु वास्तविक सामाजिक जीवन में संवैधानिक कर्तव्यों के निर्वहन और मूल्यों के पालन में अंतराल मौजूद मिला। इस शोध ने विभिन्न संकायों और लिंग के आधार पर विद्यार्थियों की जागरूकता में अंतर को स्पष्ट किया।

निष्कर्ष: माध्यमिक स्तर के विद्यार्थियों में अकादमिक ज्ञान के साथ-साथ संवैधानिक चेतना और व्यावहारिक नैतिकता का विकास अत्यंत आवश्यक सिद्ध हुआ। यह शोध यह स्पष्ट करता है कि किस प्रकार शिक्षा प्रणाली और शिक्षण पद्धतियों में सुधार करके विद्यार्थियों को देश का एक उत्तरदायी, संवेदनशील और जागरूक नागरिक बनाया जा सकेगा। यह अध्ययन भविष्य की शैक्षिक नीतियों, पाठ्यक्रम निर्माण और शिक्षकों के लिए एक मार्गदर्शक दस्तावेज के रूप में कार्य करेगा।

मुख्य शब्द: संवैधानिक मूल्य, जागरूकता, उच्च माध्यमिक स्तर, किशोरावस्था, व्यावहारिक आचरण



राज्य सरकार द्वारा चलाई गई लाडो प्रोत्साहन योजना के प्रति बी.एड. प्रशिक्षणार्थियों की जागरूकता का अध्ययन

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सारांश : शिक्षा किसी भी समाज के विकास का मूल आधार होगी। यह न केवल ज्ञान अर्जन का साधन होगी, बल्कि व्यक्तित्व, व्यवहार और सामाजिक दृष्टिकोण को आकार देने का कार्य करेगी। भारत जैसे विशाल एवं विविधतापूर्ण देश में बालिका शिक्षा का प्रसार, सामाजिक असमानताओं को दूर करने तथा स्त्री-पुरुष समानता स्थापित करने का सबसे सशक्त माध्यम सिद्ध होगी। राज्य सरकार द्वारा संचालित 'लाडो प्रोत्साहन योजना' का मुख्य उद्देश्य बालिकाओं के सुरक्षित भविष्य, उच्च शिक्षा को बढ़ावा देने तथा आर्थिक सहायता प्रदान करना है। भावी शिक्षकों (बी.एड. प्रशिक्षणार्थियों) में इस योजना के प्रति सजगता और जागरूकता होना अत्यंत आवश्यक होगी, ताकि वे भविष्य में समाज एवं बालिकाओं को इसके लाभों के प्रति सही दिशा-निर्देश दे सकें। यह शोध सीकर जिले के बी.एड. प्रशिक्षणार्थियों की इसी जागरूकता का आकलन करने का एक वैज्ञानिक प्रयास होगा। प्रस्तुत अध्ययन में सर्वेक्षण विधि का प्रयोग किया जाएगा। अध्ययन की जनसंख्या हेतु राजस्थान राज्य के सीकर जिले के कुल 160 बी.एड. परीक्षार्थियों का चयन न्यादर्श के रूप में किया जाएगा, जिसमें 80 ग्रामीण क्षेत्र तथा 80 शहरी क्षेत्र के परीक्षार्थी शामिल होंगे। डेटा संग्रहण हेतु शोधार्थी द्वारा एक स्व-निर्मित वस्तुनिष्ठ प्रश्नावली का उपयोग किया जाएगा। एकत्रित आंकड़ों के विश्लेषण हेतु माध्य, मानक विचलन और प्रतिशत जैसी सांख्यिकीय विधियों का उपयोग किया जाएगा।

अध्ययन के माध्यम से यह विश्लेषण किया गया है कि सीकर जिले के ग्रामीण एवं शहरी क्षेत्रों के बी.एड. प्रशिक्षणार्थियों में 'लाडो प्रोत्साहन योजना' की पात्रता, लाभ और प्रक्रियात्मक ज्ञान का वास्तविक स्तर उच्च स्तर रहा है। यह अध्ययन स्पष्ट करेगा कि क्या प्रशिक्षणार्थियों को योजना का किताबी ज्ञान के साथ, व्यावहारिक अनुप्रयोग और वास्तविक स्थिति में अंतर देखने को नहीं मिला। यह शोध ग्रामीण व शहरी पृष्ठभूमि के आधार पर प्रशिक्षणार्थियों की जागरूकता में अंतर को भी स्पष्ट करता है।

निष्कर्षतः यह शोध स्पष्ट करता है कि किस प्रकार भावी शिक्षकों में राज्य सरकार की बालिका कल्याणकारी योजनाओं के प्रति जागरूकता विकसित करते हैं। यह अध्ययन भविष्य की शैक्षिक नीतियों, पाठ्यक्रम निर्माण और शिक्षण पद्धतियों में सुधार करके बालिकाओं व समाज को सशक्त बनाने हेतु एक मार्गदर्शक दस्तावेज के रूप में भी कार्य करता है।

मुख्य शब्द: लाडो प्रोत्साहन योजना, जागरूकता, बी.एड. परीक्षार्थी, सीकर जिला, ग्रामीण एवं शहरी क्षेत्र

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ई-कचरा प्रबंधन के प्रति महाविद्यालय के विद्यार्थियों की जागरूकता का अध्ययन

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सारांश : पृष्ठभूमि वर्तमान समय में विद्युत एवं इलेक्ट्रॉनिक उपकरणों के बढ़ते उपयोग तथा उनके शीघ्र अप्रचलित होने के कारण ईदृकचरे की मात्रा निरंतर बढ़ रही है। मोबाइल फोन, कंप्यूटर, टेलीविजन, प्रिंटर, बैटरी तथा अन्य इलेक्ट्रॉनिक उपकरणों के अनुपयोगी होने पर उत्पन्न अपशिष्ट को ईदृकचरा कहा जाता है। ईदृकचरे में उपस्थित विभिन्न हानिकारक पदार्थों का अनुचित निपटान पर्यावरण तथा मानव स्वास्थ्य के लिए जोखिम उत्पन्न कर सकता है। इसलिए ईदृकचरे का सुरक्षित संग्रहण, पुनःउपयोग, पुनर्चक्रण तथा वैज्ञानिक निपटान आवश्यक है। महाविद्यालयीन विद्यार्थी इलेक्ट्रॉनिक उपकरणों के नियमित उपयोगकर्ता होने के साथ-साथ समाज में पर्यावरणीय जागरूकता के प्रसार में महत्वपूर्ण भूमिका निभा सकते हैं। इसी संदर्भ में प्रस्तुत अध्ययन का उद्देश्य महाविद्यालय के विद्यार्थियों में ईदृकचरा प्रबंधन के प्रति जागरूकता का अध्ययन करना है।

शोध-विधि: अध्ययन में सर्वेक्षण विधि का प्रयोग किया गया है। अध्ययन के लिए कुल 120 महाविद्यालयीन विद्यार्थियों का नमूना प्रस्तावित किया गया है जिसमें 60 शहरी तथा 60 ग्रामीण विद्यार्थी सम्मिलित हैं। प्रत्येक समूह में 30 पुरुष एवं 30 महिला विद्यार्थी रखे गए हैं। अध्ययन में आवासीय क्षेत्र को स्वतंत्र चर तथा ईदृकचरा प्रबंधन के प्रति जागरूकता को आश्रित चर माना गया है। आँकड़ों के संकलन के लिए शोधकर्ता द्वारा निमित प्रश्नावली का प्रयोग किया गया है। प्रश्नावली में ईदृकचरे के मूलभूत ज्ञान एवं प्रकार ए अनुचित निपटान के पर्यावरणीय एवं स्वास्थ्य प्रभाव, सुरक्षित प्रबंधन, पुनःउपयोग एवं पुनर्चक्रण, सरकारी नियमों एवं नीतियों तथा ईदृकचरे के निपटान से संबंधित पक्षों को सम्मिलित किया गया है। आँकड़ों के विश्लेषण हेतु प्रतिशत, माध्य तथा ज.परीक्षण का उपयोग प्रस्तावित है।

परिणाम एवं चर्चा: उपलब्ध शोध-प्रारूप में विद्यार्थियों से संकलित वास्तविक प्रतिक्रियाएँ तथा उनके सांख्यिकीय परिणाम उपलब्ध नहीं हैं। इसलिए इस सारांश में कोई काल्पनिक माध्यम ज.मूल्य या महत्वपूर्णता का स्तर प्रस्तुत नहीं किया गया है। प्रस्तावित विश्लेषण के माध्यम से शहरी एवं ग्रामीण विद्यार्थियों की ईदृकचरा प्रबंधन संबंधी जागरूकता की तुलना की जाएगी। साथ ही, ईदृकचरे के ज्ञान ए पर्यावरण एवं स्वास्थ्य प्रभावों की समझ, सुरक्षित प्रबंधन ए पुनर्चक्रण तथा नियमों एवं नीतियों की जानकारी जैसे आयामों में संभावित अंतर का परीक्षण किया जाएगा। प्राप्त निष्कर्षों को अध्ययन की निर्धारित परिकल्पनाओं के संदर्भ में व्याख्यायित किया जाएगा।

निष्कर्ष: यह अध्ययन महाविद्यालयीन विद्यार्थियों में ईदृकचरा प्रबंधन के प्रति जागरूकता की स्थिति को समझने तथा सुरक्षित निपटान ए पुनर्चक्रण एवं पुनः उपयोग के संबंध में आवश्यक शैक्षिक प्रयासों की पहचान करने में उपयोगी हो सकता है। विद्यार्थियों में वैज्ञानिक एवं पर्यावरणीय दृष्टिकोण विकसित करने के लिए महाविद्यालय स्तर पर जागरूकता कार्यक्रम, उचित निपटान संबंधी जानकारी तथा जिम्मेदार ईदृकचरा प्रबंधन व्यवहार को बढ़ावा देना महत्वपूर्ण है। अंतिम निष्कर्ष वास्तविक आँकड़ों के सांख्यिकीय विश्लेषण के पश्चात निर्धारित किए जाएंगे।

मुख्य शब्द: ईदृकचरा प्रबंधन, जागरूकता, महाविद्यालयीन विद्यार्थी, शहरी-ग्रामीण, पर्यावरण शिक्षा

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उच्च शिक्षित महिलाओं के स्वरोजगार चयन का विश्लेषणात्मक अध्ययन

कनकलता वशिष्ठ और शिप्रा गुप्ता

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सारांश: आधुनिक युग में महिला सशक्तिकरण एवं आर्थिक आत्मनिर्भरता हेतु उच्च शिक्षित महिलाओं का योगदान अत्यंत महत्वपूर्ण है। वर्तमान सामाजिक-आर्थिक परिवेश में जहाँ पारंपरिक रोजगार के अवसर सीमित हो रहे हैं, वहीं स्वरोजगार एक सशक्त विकल्प के रूप में उभरा है। राष्ट्रीय शिक्षा नीति 2020 भी 'Skill Development', 'Self-Reliance' तथा 'Entrepreneurship' को प्रोत्साहित करती है। प्रस्तुत शोध जयपुर जिले की उच्च शिक्षित महिलाओं द्वारा स्वरोजगार चयन के कारणों, उनकी शिक्षा व व्यावसायिक कौशल के मध्य संबंध तथा इस मार्ग में आने वाली प्रमुख सामाजिक, आर्थिक व पारिवारिक बाधाओं का गहराई से विश्लेषण करने का एक गुणात्मक प्रयास है।

कार्यपद्धति: यह अध्ययन पूर्णतः गुणात्मक एवं वर्णनात्मक-अन्वेषणात्मक शोध अभिकल्प पर आधारित है। अध्ययन के नमूने हेतु उद्देश्यपूर्ण प्रतिचयन विधि द्वारा जयपुर जिले की स्वरोजगार में संलग्न 30 उच्च शिक्षित महिलाओं (स्नातक एवं स्नातकोत्तर) का चयन किया गया है। डेटा संकलन हेतु स्व-निर्मित 'अर्ध-संरचित साक्षात्कार अनुसूची' और क्षेत्र-अवलोकन का उपयोग किया गया है। प्राप्त गुणात्मक प्रदत्तों का विश्लेषण 'विषयवस्तु/भीमात्मक विश्लेषण' के माध्यम से किया गया है।

परिणाम और चर्चा: अध्ययन के माध्यम से उच्च शिक्षित महिलाओं के स्वरोजगार चुनने के प्राथमिक कारणों—जैसे आर्थिक स्वतंत्रता, लचीला कार्य-समय और निर्णय लेने की स्वायत्तता—का प्रकटीकरण किया गया है। यह विश्लेषण स्पष्ट करता है कि शैक्षिक योग्यता और व्यावसायिक कौशल (जैसे वित्तीय एवं विपणन प्रबंधन) के बीच सीधा सकारात्मक संबंध है, जो व्यवसाय के सफल संचालन को सुगम बनाता है। इसके साथ ही, शोध में महिलाओं द्वारा सामना की जाने वाली प्रमुख पारिवारिक, सामाजिक और वित्तीय बाधाओं की पहचान कर उनके व्यावहारिक अनुभवों को प्रस्तुत किया गया है।

निष्कर्ष: निष्कर्षतः, यह शोध स्पष्ट करता है कि यदि उच्च शिक्षित महिलाओं को उपयुक्त व्यावसायिक प्रशिक्षण, पारिवारिक सहयोग और सुलभ संसाधन प्राप्त हों, तो स्वरोजगार न केवल उनकी व्यक्तिगत प्रगति का माध्यम बनता है, बल्कि समाज के आर्थिक विकास को भी गति प्रदान करता है। यह अध्ययन नीति-निर्माताओं, शैक्षिक संस्थानों और समाज को महिलाओं की उद्यमिता को बढ़ावा देने हेतु एक व्यावहारिक दृष्टिकोण प्रदान करता है।

मुख्य शब्द: उच्च शिक्षित महिलाएँ, स्वरोजगार, व्यावसायिक कौशल, गुणात्मक अध्ययन, जयपुर जिला

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जैव विविधता संरक्षण के प्रति उच्च माध्यमिक स्तर के विद्यार्थियों की जागरूकता का अध्ययन

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सारांश:

जैव विविधता पृथ्वी के पारिस्थितिकीय संतुलन एवं मानव जीवन के सतत अस्तित्व का मूल आधार है। औद्योगीकरण, अंधाधुंध शहरीकरण, वनों की कटाई एवं जलवायु परिवर्तन के कारण जैव विविधता पर गंभीर संकट उत्पन्न हो गया है। पर्यावरण संरक्षण एवं सतत विकास की दिशा में भावी पीढ़ी की भूमिका सर्वाधिक महत्वपूर्ण है। उच्च माध्यमिक स्तर (कक्षा 11 व 12) के विद्यार्थी अपने जीवन के उस मोड़ पर होते हैं जहाँ उनकी वैचारिक समझ व दृष्टिकोण का तेजी से विकास होता है। इस स्तर पर विद्यार्थियों में जैव विविधता के मूल्य, पारिस्थितिकीय संतुलन तथा संरक्षण के प्रति सही जागरूकता और संवेदनशील दृष्टिकोण होना नितांत आवश्यक है, ताकि वे पर्यावरण के प्रति उत्तरदायी नागरिक बन सकें। यह शोध उच्च माध्यमिक स्तर के विद्यार्थियों की जैव विविधता संरक्षण के प्रति जागरूकता का आकलन करने का एक व्यवस्थित वैज्ञानिक प्रयास है।

कार्यपद्धति: प्रस्तुत अध्ययन में सर्वेक्षण विधि का प्रयोग किया जाएगा। अध्ययन की जनसंख्या हेतु राजस्थान राज्य के जयपुर जिले के उच्च माध्यमिक विद्यालयों से कुल 160 विद्यार्थियों का चयन यादृच्छिक न्यादर्श के रूप में किया जाएगा। इसमें 80 छात्र एवं 80 छात्राएं (अथवा 80 विज्ञान संकाय एवं 80 कला/वाणिज्य संकाय के विद्यार्थी) सम्मिलित होंगे। डेटा संकलन हेतु शोधार्थी द्वारा एक स्व-निर्मित वस्तुनिष्ठ 'जैव विविधता संरक्षण जागरूकता मापनी का उपयोग किया जाएगा। संकलित प्रदत्तों के सांख्यिकीय विश्लेषण हेतु माध्य, मानक विचलन, ज.जमेज तथा प्रतिशत जैसी उपयुक्त सांख्यिकीय प्रविधियों का प्रयोग किया जाएगा।

परिणाम और चर्चा: अध्ययन के माध्यम से यह विश्लेषण किया जाएगा कि जयपुर जिले के उच्च माध्यमिक स्तर के विद्यार्थियों में जैव विविधता के संकट, प्रजातियों के विलोपन, स्थानीय वनस्पतियों व जीवों के संरक्षण तथा पर्यावरणीय नीतियों के प्रति जागरूकता का वास्तविक स्तर क्या है। यह शोध स्पष्ट करेगा कि क्या विद्यार्थियों को जैव विविधता का केवल सैद्धांतिक किताबी ज्ञान है या वे दैनिक जीवन में संरक्षण के प्रति व्यावहारिक सजगता भी रखते हैं। साथ ही, यह शोध लिंग (छात्र व छात्राएं) तथा अध्ययन संकाय (विज्ञान व कला) के आधार पर विद्यार्थियों की जागरूकता स्तर में अंतर को भी विश्लेषित करेगा।

निष्कर्ष: यह शोध स्पष्ट करेगा कि उच्च माध्यमिक स्तर पर पर्यावरण शिक्षा एवं जैव विविधता संरक्षण से जुड़े व्यावहारिक कार्यक्रमों की कितनी प्रभावशीलता है। इस अध्ययन के निष्कर्ष भविष्य में शिक्षाविदों, पाठ्यक्रम निर्माताओं तथा नीति-निर्माताओं के लिए माध्यमिक शिक्षा में पर्यावरण संरक्षण से संबंधित व्यावहारिक, अनुभवात्मक एवं गतिविधि-आधारित शिक्षण पद्धतियों को सुदृढ़ करने हेतु एक महत्वपूर्ण मार्गदर्शक आधार प्रदान करेंगे।

मुख्य शब्द: जैव विविधता संरक्षण, जागरूकता, उच्च माध्यमिक स्तर के विद्यार्थी, पर्यावरण शिक्षा, जयपुर जिला



छात्रों के शैक्षिक प्रदर्शन पर शारीरिक शिक्षा का प्रभाव

अर्चना शर्मा और भारती शर्मा

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सारांश:

शिक्षा सामाजिक विकास का मूल आधार है। यह न केवल ज्ञान अर्जन का साधन है, बल्कि व्यक्तित्व, व्यवहार और सामाजिक-संवर्गत्मक समायोजन के विकास का एक महत्वपूर्ण माध्यम है। नियमित शारीरिक गतिविधि और खेलकूद में भागीदारी छात्रों के समग्र विकास में योगदान देती है। शारीरिक शिक्षा मानसिक तनाव को कम करने, एकाग्रता बढ़ाने और सकारात्मक दृष्टिकोण विकसित करने में मदद करती है, जो छात्रों के शैक्षणिक परफॉरमेंस को सहायता प्रदान कर सकती है। इसलिए, वर्तमान अध्ययन का उद्देश्य जयपुर जिले के छात्रों के शैक्षणिक परफॉरमेंस पर शारीरिक शिक्षा के प्रभाव का परीक्षण करना है।

वर्तमान अध्ययन में सह-संबंधात्मक दृष्टिकोण के साथ सर्वेक्षण विधि का उपयोग किया गया है। अध्ययन के लिए, जयपुर जिले के माध्यमिक और उच्च माध्यमिक विद्यालयों के 160 छात्रों का एक प्रतिदर्श (सैंपल) रैंडम सैंपलींग के माध्यम से चुना गया, जिसमें 80 छात्र और 80 छात्राएं शामिल किए गये। आंकड़े शारीरिक शिक्षा से संबंधित एक स्वरचित प्रश्नावली और छात्रों के शैक्षणिक रिकॉर्ड का उपयोग कर के इकट्ठे किए गये। इकट्ठे किए गए आंकड़ों का विश्लेषण हेतु औसत, मानक विचलन टी-टेस्ट और प्रतिशत जैसी सांख्यिकीय तकनीकों का उपयोग करवेफ किया जाएगा। इकट्ठे किए गए आंकड़ों का विश्लेषण में शारीरिक शिक्षा और खेलकूद में नियमित भागीदारी छात्रों के शैक्षणिक परफॉरमेंस और लिंग और स्कूल की पृष्ठभूमि के आधार पर अंतर देखा गया। यह अध्ययन शारीरिक शिक्षा और शैक्षणिक परफॉरमेंस के बीच संबंध की पहचान करने में मददगार साबित हुआ और यह शैक्षणिक महत्ता को समझने का आधार प्रदान करता है।

अध्ययन से यह निष्कर्ष निकला कि शारीरिक शिक्षा केवल एक सह-शैक्षणिक गतिविधि नहीं है, बल्कि छात्रों के समग्र विकास का एक महत्वपूर्ण हिस्सा है। यह शारीरिक और मानसिक स्वास्थ्य, एकाग्रता और सकारात्मक दृष्टिकोण के विकास में योगदान दे सकता है। इस अध्ययन के परिणाम स्कूल की समय-तालिका (टाईम-टेबल) के नियोजन और शिक्षण अभ्यासों में सुधार के लिए उपयोगी हनपकंदबम प्रदान कर सकते हैं और छात्रों के समग्र विकास के लिए एक मार्ग अनुशासन दस्तावेज पर कार्य कर सकते हैं।

मुख्य शब्द: शारीरिक शिक्षा, शैक्षणिक परफॉरमेंस, जयपुर जिला, मानसिक स्वास्थ्य और एकाग्रता



बालकों को लैंगिक अपराधों से संरक्षण (POCSO अधिनियम के प्रति माध्यमिक विद्यालय शिक्षकों की जागरूकता का अध्ययन)

पूजा पारीक और मिनाक्षी शर्मा

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शोध-सार:

बालकों को लैंगिक अपराधों से संरक्षण प्रदान करना उनकी सुरक्षा, गरिमा और समग्र विकास के लिए अत्यंत आवश्यक है। विद्यालयी परिवेश में शिक्षक बच्चों के साथ निरंतर संपर्क में रहते हैं, इसलिए लैंगिक अपराधों से बालकों का संरक्षण अधिनियम, 2012 (POCSO Act) के प्रावधानों के प्रति उनकी जागरूकता बाल संरक्षण की प्रभावी व्यवस्था में महत्वपूर्ण भूमिका निभाती है। प्रस्तुत अध्ययन का उद्देश्य माध्यमिक विद्यालय के शिक्षकों में चूँचू अधिनियम के प्रमुख प्रावधानों के प्रति जागरूकता का अध्ययन करना है। अध्ययन के लिए वर्णनात्मक सर्वेक्षण विधि का प्रयोग किया गया। चयनित माध्यमिक विद्यालयों के शिक्षकों को अध्ययन के नमूने के रूप में सम्मिलित किया गया तथा आंकड़ों के संकलन के लिए POCSO अधिनियम के विभिन्न प्रावधानों पर आधारित जागरूकता प्रश्नावली का प्रयोग किया गया। प्राप्त आंकड़ों का विश्लेषण उपयुक्त सांख्यिकीय विधियों द्वारा किया गया। अध्ययन में शिक्षकों की लैंगिक अपराधों की पहचान, अनिवार्य रिपोर्टिंग, बच्चों की सुरक्षा तथा POCSO अधिनियम के अंतर्गत निर्धारित कानूनी प्रक्रियाओं से संबंधित जागरूकता का आकलन किया गया। अध्ययन के निष्कर्ष विद्यालयों में बाल संरक्षण को सुदृढ़ करने तथा शिक्षकों के लिए POCSO अधिनियम से संबंधित नियमित प्रशिक्षण एवं जागरूकता कार्यक्रमों की आवश्यकता को समझने में उपयोगी होंगे। यह अध्ययन सुरक्षित, संवेदनशील और बाल-अनुकूल विद्यालयी वातावरण के निर्माण में शिक्षकों की भूमिका को प्रभावी बनाने की दिशा में योगदान कर सकता है।

मुख्य शब्द: अधिनियम, बाल संरक्षण, शिक्षक जागरूकता, माध्यमिक विद्यालय, लैंगिक अपराध, बाल सुरक्षा।

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उच्च माध्यमिक स्तर के विद्यार्थियों में कोचिंग संस्थानों से बढ़ते तनाव का अध्ययन

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शोध-सार:

वर्तमान प्रतिस्पर्धी युग में उच्च माध्यमिक स्तर के विद्यार्थियों पर शारीरिक सफलता और प्रतियोगी परीक्षाओं, जैसे NEET, JEE आदि में उत्कृष्ट प्रदर्शन करने का अत्यधिक दबाव है। इस दौड़ में कोचिंग संस्थानों की भूमिका अत्यंत महत्वपूर्ण हो गई है, परंतु साथ ही कोचिंग की कठोर दिनचर्या, अत्यधिक

पाठ्यक्रम, लगातार होने वाले मूल्यांकन परीक्षा और अभिभावकों की उच्च आकांक्षा, विद्यार्थियों में मानसिक तनाव, चिंता व अवसाद का कारण बन रही हैं। विद्यालय और कोचिंग के दोहरे बोझ के कारण विद्यार्थियों के शारीरिक और मानसिक स्वास्थ्य पर प्रतिकूल प्रभाव पड़ रहा है। प्रस्तुत अध्ययन का मुख्य उद्देश्य उच्च माध्यमिक स्तर के विद्यार्थियों में कोचिंग संस्थानों के कारण उत्पन्न हो रहे तनाव के स्तर तथा इसके कारणों का विश्लेषणात्मक अध्ययन करना है।

कार्यपद्धति:

प्रस्तुत अध्ययन में वर्णनात्मक सर्वेक्षण विधि का प्रयोग किया जाएगा। अध्ययन हेतु उच्च माध्यमिक स्तर के कुल 120 कोचिंग अध्ययनरत विद्यार्थियों का चयन यादृच्छिक प्रतिदर्श विधि द्वारा किया जाएगा। आंकड़ों के संग्रहण हेतु शोधार्थी द्वारा एक स्व-निर्मित कोचिंग तनाव मापनी का उपयोग किया जाएगा। प्राप्त आंकड़ों के विश्लेषण एवं व्याख्या के लिए मध्यमान, मानक विचलन, प्रतिशत तथा –परीक्षण जैसी उपयुक्त सांख्यिकीय विधियों का प्रयोग किया जाता।

परिणाम एवं चर्चा:

अध्ययन के संभावित परिणामों से यह स्पष्ट होने की संभावना है कि कोचिंग संस्थानों की प्रतिस्पर्धी कार्यशैली, लंबे अध्ययन घंटे और उच्च अपेक्षाएं विद्यार्थियों में मानसिक दबाव को काफी हद तक बढ़ा देती हैं। इसके साथ ही अध्ययन में छात्र एवं छात्राओं के तनाव स्तर तथा विभिन्न विषयों (विज्ञान, कला, वाणिज्य) के विद्यार्थियों में तनाव के अंतर का भी तुलनात्मक विश्लेषण किया गया है।

निष्कर्ष: निष्कर्षतः, यह शोध इंगित करता है कि कोचिंग संस्थानों में अध्ययनरत विद्यार्थियों के तनाव को कम करने के लिए अकादमिक मार्गदर्शन के साथ-साथ मानसिक स्वास्थ्य परामर्श, समय प्रबंधन तकनीकें और संतुलित दिनचर्या अत्यंत आवश्यक हैं। यह अध्ययन शिक्षाविदों, अभिभावकों, नीति निर्माताओं और कोचिंग संचालकों के लिए विद्यार्थियों के तनावमुक्त शिक्षा वातावरण के निर्माण हेतु एक महत्वपूर्ण मार्गदर्शक सिद्ध होगा।

मुख्य शब्द: शारीरिक सफलता और प्रतियोगी परीक्षा, मूल्यांकन परीक्षा, अभिभावक, कोचिंग

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विनोद कुमार शुक्ल के उपन्यास में मानवता के लिए नैतिकता, मूल्य और कृत्रिम बुद्धिमत्ता (AI) की जिम्मेदारी

अनुजा शर्मा और संजू झा

महाराज विनायक ग्लोबल यूनिवर्सिटी जयपुर

सारांश:

मानव जगत में AI मानव व्यवहार, नैतिकता, जीवन मूल्य सहज रूप रखते हैं। मनुष्य प्रकृति का स्वामी नहीं बल्कि एक अभिन्न अंग है, मानव व्यवहार में आम आदमी, खुशियों के पल, संघर्षों व संवेदनाओं को केंद्रित किया गया है।

मानव व्यवहार: विनोद कुमार शुक्ल ने अपने उपन्यासों में निम्न मध्यवर्गीय परिवारों में समस्याओं और सामाजिक बदलावों पर गहन अध्ययन किया है। निम्न मध्यवर्गीय परिवार के व्यवहार में निश्चल प्रेम और मासूमियत जो कि शहरी मानव व्यवहार की चालाकियों से दूर, अजनबी लोगों के प्रति आत्मीय व्यवहार को दर्शाया है। साहित्य में विनोद कुमार शुक्ल ने अपनी भाषा के माध्यम से मानव व्यवहार में प्रकृति को अपने परिवार में पेड़-पौधों, पक्षियों, हवा को सदस्य के रूप में माना है।

मुख्य बिंदु:

- AI भाषा के माध्यम से मानव प्रेम-संबंधों को उनकी भाषा के माध्यम से जोड़ता है।
- AI के माध्यम से भाषा के परिणामों में सुधार।
- AI के माध्यम से पारस्परिक आत्मीयता में बढ़ोतरी।

नैतिकता: तकनीकी माध्यम से नैतिकता व्यवस्था, शोषण व कम आय के खिलाफ सोशल मीडिया / AI के माध्यम से मौन प्रतिरोध जताया जाता है। जैसे शुक्ल जी के उपन्यास शदीवार में एक खिड़की रहती थी में रघुवर प्रसाद अपनी कम आय में संतुष्ट रहते हैं, वही संतोष उनकी नैतिकता को दर्शाता है। गलत के सामने नहीं झुकना मानव की नैतिकता को दर्शाया गया है। जीव-जन्तुओं के प्रति दया, मानवता के प्रति दया, नैतिकता व संवेदनशीलता रखना।

मुख्य बिंदु:

- AI अत्याचारों या शोषण के खिलाफ अपनी बात सरकार तक पहुँचाने का जरिया बनता है।
- AI नैतिकता और लोकप्रियता को प्रभावित करता है।
- AI मानवता और नैतिकता को खतरे के रूप में नहीं बल्कि पूरक के रूप में रेखांकित करता है।

मानवीय मूल्यों की जिम्मेदारी: विनोद कुमार शुक्ल के उपन्यास में जहाँ मानव अपने आप को अकेला व असुरक्षित महसूस करता है, AI के माध्यम से वह अपनी मानवीय मूल्यों की जिम्मेदारी को भी निभाता है। AI के माध्यम से मानव व प्रकृति के संबंधों को बल मिलता है। विनोद कुमार शुक्ल जी साहित्य के माध्यम से संदेश प्रस्तुत करते हैं कि प्रकृति को बचाने के लिए हमें बाहर जाने की जरूरत नहीं बल्कि अपने भीतर संवेदनशीलता को जगाने की जरूरत है।

शब्दार्थ : मौन प्रतिरोध – चुप रहकर प्रतिरोध करना, पारस्परिक – आपस में तादाम्य – संबंध

निष्कर्ष : विनोद कुमार शुक्ल के उपन्यास में जहाँ मनव पर हुये शोषण का विरोध अपने साहित्य के माध्यम से जन-जन तक पहुँचाया है, वहाँ वर्तमान समय में AI के माध्यम से आज युवा वर्ग शोषण अत्याचार का विरोध कर सकेगा। अपने मानवीय मूल्य नैतिक मूल्य व मानवीय व्यवहार में विकास कर सकेगा

मुख्य शब्द : विनोद कुमार शुक्ल, AI, मानवीय मूल्य, नैतिक मूल्य, मानवीय व्यवहार



AI in Education, Learning and Knowledge Creation

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Abstract:

Artificial Intelligence (AI) is gradually becoming an important part of education and is influencing the way teaching, learning and knowledge creation take place. Its role is not limited to the use of digital tools; it is also creating new possibilities for teachers and learners to understand explore and share knowledge in more meaningful ways. AI-based applications can support personalized learning, provide quick feedback, help teachers in preparing learning materials and make educational content more accessible to students with different learning needs.

In the learning process, AI can encourage students to learn at their own pace and explore subjects beyond the traditional classroom. It can help learners find relevant information, develop new ideas and receive support according to their individual needs. At the same time, the growing use of AI also raises important questions related to originality, critical thinking, academic honesty, data privacy and the changing role of teachers. Easy access to AI-generated information may sometimes reduce students' efforts to think independently if these tools are used without proper guidance. AI is also influencing knowledge creation by helping researchers and educators organize information, identify patterns, generate ideas and communicate knowledge in new forms. However, technology cannot replace human understanding, creativity, values and judgment. Therefore, the effective use of AI in education requires a balanced approach in which technology supports human learning rather than taking its place.

The present paper discusses the changing role of AI in education, its contribution to teaching and learning, and its emerging influence on knowledge creation. It also highlights the need for responsible, ethical and thoughtful use of AI so that technological development can contribute to meaningful learning, creativity and the overall development of learners.

Keywords: Artificial Intelligence, Education, Learning, Knowledge Creation, Personalized Learning, Ethical Use of AI



Artificial Intelligence and Human Life : The New Reality of a Changing World

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Abstract:

Nowadays, when we watch a video on YouTube, another one starts automatically as soon as the first one ends. When we make a spelling mistake while typing, the autocorrect feature fixes it automatically; this is AI. People often equate AI solely with ChatGPT or robots, but the reality is that AI has seamlessly integrated into our lives in invisible ways. We use many things daily where AI operates behind the scenes without us even noticing. This study analyzes the current utilization of Artificial Intelligence (AI), its role in the law-and-order system, its potential impact on the judicial system, and its positive and negative dimensions. For the purpose of this study, available information regarding AI, relevant examples, and its applications across various sectors were examined. Based on this, an effort has been made to understand the utility of AI, potential challenges, algorithmic bias, cybercrime, natural disaster forecasting, and its overall impact on human life. Furthermore, the necessity of human wisdom, responsibility, and caution in the context of the growing use of AI has also been considered.

- Lawyers and judicial officers can spend a significant amount of time reviewing past judgments, laws, and voluminous documents. AI can rapidly search through vast amounts of legal material to retrieve relevant information.
- Cybercrimes are constantly evolving. AI can be utilized to detect unusual or suspicious activities.
- Many people are unaware of their legal rights or do not know where to go or how to file a complaint if those rights are violated. One can obtain answers to such questions by interacting with AI.
- India is a multilingual country where numerous languages are spoken. Language barriers pose a major challenge for the development of tourism, transportation, and industry. AI translators can translate and communicate information across different languages.
- AI is also used to predict natural disasters

Today, AI is no longer merely a technology; it has become an integral part of our daily lives and society. It is helping to streamline and simplify tasks across diverse sectors such as education, law enforcement, cybersecurity, healthcare, transportation, and disaster management. Yet, this advancement brings challenges. If AI is fed incorrect or biased data, its outputs will inevitably be flawed or biased. Therefore, rather than relying entirely on AI, it is crucial to balance its use with human judgment, discretion, and responsibility. The goal of AI should not be to replace humans, but

to augment human capabilities. As AI's influence grows, how we choose to utilize it becomes critical. Guided by the right direction, accurate data, and human values, AI can become a powerful tool for making the justice system and society faster, more accessible, fairer, and better. Ultimately, the effectiveness of AI depends not only on the technology itself but also on the wisdom and responsibility with which humans employ it.

Keywords: Artificial Intelligence, Law and Order, Human Thinking, Justice System, Cyber Crime



Relationship between Artificial Intelligence (AI) and Digital Arrest

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Abstract:

Artificial Intelligence (AI) has become an important part of modern digital communication and technology. It is increasingly used in communication, education, banking, cyber security, and other areas of daily life. Along with its benefits, AI also creates new challenges in the field of cybercrime. Digital arrest is an emerging form of cyber fraud in which criminals impersonate police officers, government officials, or other authorities. Criminals may use phone calls, video calls, messages, and fabricated documents to make their claims appear genuine. The development of AI has increased the sophistication of such fraudulent activities. AI-based tools can be used to create convincing voices, images, videos, and personalised messages. However, AI can also be used to combat cybercrime. AI-based systems can identify suspicious patterns, detect fraudulent transactions, analyse unusual online behaviour, and support cyber security efforts. Therefore, AI has both positive and negative effects on digital arrest.

The present study focuses on understanding the effect of AI on digital arrest and examining the importance of awareness and preventive measures among students of higher education institutions.

A descriptive survey method was adopted for the study the sample consisted of 120 students from higher education institutions. The participants were selected through an appropriate sampling technique. A structured questionnaire was developed by the researcher to collect information regarding the effect of AI on digital arrest. The data were collected from the selected respondents through the questionnaire. The collected data were analysed using descriptive statistical techniques such as frequency, percentage, mean, and standard deviation, wherever appropriate.

The results showed that most of the respondents had some awareness of cybercrime and online fraud. However, their specific awareness regarding the concept and techniques of digital arrest

varied. The findings indicated that AI had contributed to making digital-arrest scams more sophisticated. AI-assisted techniques such as realistic voice generation, manipulated images or videos, personalised messages, and automated communication could make fraudulent communication appear more authentic.

The study further indicated that awareness and digital literacy played an important role in protecting individuals from digital-arrest fraud. The findings also showed that AI could be used positively for cybercrime prevention. AI-based systems could help detect suspicious transactions, identify unusual communication patterns, and support cyber security professionals in detecting fraudulent activities. Thus, the results suggested that AI had a dual impact on digital arrest. It had provided criminals with sophisticated tools for fraud, while it had also provided opportunities for developing stronger systems for cybercrime detection and prevention. The study concluded that Artificial Intelligence had significantly influenced the nature and sophistication of digital-arrest fraud. AI-assisted technologies had made fraudulent communication more convincing and had increased the potential risks faced by individuals. The study also concluded that awareness and digital literacy had played an important role in reducing vulnerability to digital-arrest scams. It was further concluded that AI could also be effectively used for detecting and preventing cybercrime. Therefore, a balanced approach involving AI-based cyber security systems, awareness programmes, digital literacy, and responsible use of technology was considered necessary for reducing the risks associated with digital arrest. Higher education institutions were recommended to conduct regular cyber security awareness programmes and practical training so that students could better identify and respond to emerging AI-enabled cyber threats.

Keywords: Artificial Intelligence, Digital Arrest, Cybercrime, Cyber security, Digital Awareness



Education and Women's Mobilization for Legal Reform in the 21st Century: A Review

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Abstract:

Education plays an important role in helping women understand their rights and participate in changes taking place in society. In the 21st century, access to education has increased the opportunities available to women to learn about equality, justice, employment, safety, marriage, property, and other legal rights. Education does not only provide knowledge; it can also develop confidence, decision-making skills, communication, and the ability to question unfair practices. However, many women still face social pressure, financial dependence, lack of legal awareness, and

limited access to support. This review explores how education can encourage women to become more aware of their rights and take part in efforts for legal reforms. This review is based on existing literature, reports, academic discussions, and publicly available information related to women's education, legal awareness, gender equality, and social mobilization. The review focuses on the changing role of education in the 21st century and considers both formal education through schools and colleges and informal learning through community programmes, media, and digital platforms. It also examines the challenges that can prevent women from turning awareness into active participation.

The review suggests that education can create greater awareness among women about laws and rights that directly affect their lives. It can encourage women to express their views, make informed decisions, seek support, and participate in discussions about social and legal issues. Education also provides opportunities for women to connect with others and collectively raise concerns about discrimination and inequality. In the 21st century, digital platforms have further expanded these opportunities by making information easier to share and by allowing women to connect beyond their immediate communities. At the same time, education alone cannot remove all barriers faced by women. Differences in economic conditions, digital access, family support, location, and the quality of education can affect how women use the knowledge they gain. Therefore, education needs to be supported by legal literacy programmes, accessible legal services, safe spaces, and institutions that respond to women's concerns. When women have knowledge as well as the confidence and support to use it, education can become a meaningful part of social mobilization and legal change.

Education should be understood not only as a means of gaining qualifications but also as a way of developing awareness, confidence, and participation. In the 21st century, educated and informed women can contribute to discussions about equality and support efforts for legal reform. Strengthening women's education and legal awareness, along with providing proper support systems, can help create greater participation of women in social and legal change.

Keywords: Women, Mobilization, Education, 21st Century, Legal Reforms



Education and its Role in the Socioeconomic Development of Slum Communities in Rajasthan: A Review

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Abstract:

Education is widely recognised as an important means of improving the social and economic conditions of disadvantaged communities. In Rajasthan, many families living in slum areas face

difficulties in accessing regular and quality education because of poverty, migration, insecure employment, limited awareness, and inadequate basic facilities. This review examines how education can influence the lives of people living in slum areas of Rajasthan and highlights the factors that shape educational access and outcomes.

The reviewed literature and available reports indicate that education can contribute to socioeconomic development at both individual and community levels. Regular schooling can improve basic literacy, knowledge, communication skills, and awareness of health, rights, government services, and employment opportunities. For children from low-income households, continued education may also create better opportunities for skill development and future livelihoods. Education is especially important for girls, as it can strengthen confidence, decision-making ability, awareness of rights, and participation in family and community matters. However, the benefits of education are not automatic. Attendance and continuation may be affected by household income, migration, child-care responsibilities, distance from schools, lack of learning support, and limited awareness among parents.

The review also highlights the importance of the quality of education, not only school enrolment. Safe learning spaces, trained teachers, suitable learning materials, digital access, regular attendance, and supportive school environments can influence learning outcomes. Community engagement can further strengthen educational participation. When parents, teachers, local organisations, and community members work together, they can identify barriers, encourage children to remain in school, and create greater awareness about available opportunities. Government initiatives in Rajasthan have also focused on education, scholarships, support for disadvantaged students, and improvement of services for urban poor communities. The review further shows that educational progress is closely connected with the wider living conditions of slum communities. Problems related to housing, sanitation, health, transport, and unstable work can affect a child's ability to attend and learn regularly. Therefore, educational planning should be linked with social protection and basic services. Adult education and awareness activities can also help parents understand the value of schooling and support children's learning at home. Local volunteers, self-help groups, and community organisations can play a useful role in reaching families who may remain outside formal systems. This can make educational support more practical, local, inclusive, and sustainable.

Overall, this review suggests that education in slum areas should be viewed as a long-term process of empowerment rather than only a means of obtaining literacy. Improving access to quality education, strengthening community participation, increasing awareness of government schemes, and reducing social and economic barriers can help create better opportunities for children and families. A coordinated approach involving government departments, schools, teachers, families, NGOs, and local communities is therefore important for making education more inclusive and meaningful in Rajasthan's slum areas.

Keywords: Socioeconomic development; Empowerment; Quality; Access; Awareness; Community engagement; Government initiatives; Slum areas; Rajasthan; Education



Green Technology and Digital Responsibility: A Path to a Sustainable Future

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Abstract:

Green technology and digital responsibility are important approaches for achieving a sustainable future. Green technology focuses on reducing environmental pollution, conserving natural resources, improving energy efficiency, and protecting biodiversity. Digital responsibility refers to the responsible use of digital technologies while considering their environmental and social impacts. In Botany, these approaches can support plant conservation, sustainable agriculture, biodiversity monitoring, and environmental education.

The present review was prepared after studying and discussing the practical applications of green technology and digital responsibility in Botany. Different examples related to plant growth, biodiversity conservation, waste management, water conservation, renewable energy, and digital tools were considered. The role of digital applications such as online databases, digital herbariums, geographical information systems, remote sensing, and mobile-based plant identification tools was also reviewed. The practical activity helped in understanding how technology can be used along with biological knowledge for environmental protection.

The practical study showed that green technology can contribute significantly to sustainable plant-based activities. Technologies such as drip irrigation, solar energy, composting, rainwater harvesting, and organic waste management can reduce pressure on natural resources. In Botany, digital technologies can help students and researchers record plant species, identify plants, maintain digital herbarium records, and monitor changes in vegetation and biodiversity. Digital platforms also make botanical information easily accessible for education and research. However, responsible use of technology is necessary because electronic devices generate e-waste and require energy and natural resources. Therefore, proper e-waste management, energy-efficient devices, reduction of unnecessary digital consumption, and responsible sharing of information are essential parts of digital responsibility.

Green technology and digital responsibility together provide useful methods for building a sustainable future. The practical experience helped us understand that technological development and environmental conservation should go hand in hand. As botany students, we can contribute by promoting plant conservation, sustainable use of natural resources, biodiversity awareness, and environmentally responsible use of digital technology. Integrating botanical knowledge with green and digital technologies can support a healthier environment and a more sustainable society.

Keywords: Green Technology; Digital Responsibility; Botany; Biodiversity; Sustainability.



Cybersecurity Laws and Ai-Based Threats: Rethinking Legal Responses to Emerging Digital Risks

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Abstract:

The rapid integration of artificial intelligence (AI) into digital infrastructure has created new opportunities for innovation while simultaneously expanding the scale and sophistication of cybersecurity threats. AI can be used to automate attacks, generate highly convincing deceptive content, identify vulnerabilities and accelerate the exploitation of digital systems. These developments challenge conventional approaches to cybersecurity regulation because the speed, adaptability and cross-border character of AI-enabled threats can exceed the assumptions on which traditional legal frameworks were developed.

This paper adopts a qualitative, doctrinal and analytical approach to examine the adequacy of existing cybersecurity laws in responding to AI-based threats. It explores key legal concerns surrounding responsibility and attribution, prevention and reporting of cyber incidents, protection of critical digital infrastructure, privacy, cross-border enforcement and the evidentiary difficulties associated with AI-assisted cyber offences. The study also considers the regulatory tension between encouraging technological innovation and imposing safeguards capable of preventing the misuse of emerging technologies.

The analysis suggests that cybersecurity regulation must move from a predominantly reactive model towards a risk-based and technology-aware framework. Legal responsibility should be capable of addressing not only the individual perpetrator but also relevant failures in organisational security, system governance and risk management, while preserving principles of fairness and proportionality. At the same time, excessive regulation may discourage legitimate research and innovation, making a balanced approach essential.

The paper concludes that effective governance of AI-based cybersecurity threats requires coordination between cyber law, data protection, technological standards and institutional enforcement. Strengthening incident-response mechanisms, improving digital-forensics capabilities, developing clearer standards for AI-related accountability and promoting international cooperation can make the legal system more resilient. A future-ready cybersecurity regime should therefore protect individuals, institutions and critical infrastructure without treating technological innovation itself as a legal risk.

Keywords: Cybersecurity Law, Artificial Intelligence, AI-Based Threats, Cybercrime, Digital Infrastructure, Accountability, Data Protection, Cyber Governance



Cyber Evidence

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Abstract:

Any electronic data that is acceptable in a court of law is considered digital evidence. Email correspondence, communications in the majority of communication formats, electronic documents, social media posts, and data from PCs or cell phones are all included in this. Digital evidence is defined as a relatively broad construct that includes files and content, data about data, and activity that records and records user behaviour on a computer or system.

Cyber law, on the other hand, is defined as the legal issues related to the use of the internet and information technology. Cybercrime, internet commerce, and cyberspace are all governed by legislation. Cyber law covers a wide range of legal domains that govern data privacy, freedom of speech, information access, and idea ownership. Cyber law provides legal principles for the prosecution of computer evidence; in other words, it establishes the norms for the collection, storage, and presentation of such evidence in court. The use of digital evidence is becoming more noticeable in the legal systems as more interactions move to the digital sphere. The handling of this evidence, the observance of people's rights, and the administration of justice are all governed by internet law. Therefore, cyber law is the legislation governing all activities in the cyberspace, whereas digital forensics is the process of locating all evidence to be utilized in court.

The use of digital evidence in conjunction with cyber laws has been considered a significant role in improving the administration of justice in today's society. Emails, text messages, SMS, social network updates, files saved on a computer or network, and logs are examples of electronic data, also known as digital data, which are data in electronic form and are frequently used in civil and criminal investigations. The comprehensive tracking of a user's behaviours that can be easily tracked to obtain some crucial information in the case is known as digital profiling. These are crucial digital trails in cyber law where crimes are committed across geographical boundaries, making it difficult to use conventional criminal detection techniques that involve gathering tangible evidence. The legal framework includes the ideas of digital evidence and cyber law, particularly in light of the rise in digital transactions and cyber activity. Consequently, emails, social media posts, and other digital data might be considered the essential components of both civil and criminal prosecutions. The Information Technology Act, 2000, often known as the IT Act, governs digital evidence and cyberspace in India.

In the State of Maharashtra v. Dr. Praful B. Desai (2003) case, the Supreme Court upheld the use of video conferencing techniques in recording witness testimony because technology is playing an important role in the judicial system. This illustrates the social issue: the reliability and admissibility of evidence through video conferencing in recording witness deposition.

Keywords: evidence, cyber law, electronic, email



Risks of AI

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Abstract:

The use of intelligent algorithms and machine learning approaches to improve cyber threat detection, prevention, and response is known as artificial intelligence (AI). AI enables cybersecurity systems to evaluate enormous volumes of data, spot trends, and come to well-informed conclusions at speeds and scales that are faster than those of humans. AI plays a variety of roles in supporting security measures. It can automate repetitive processes like vulnerability scanning and log analysis, allowing human analysts to concentrate on more intricate and strategic responsibilities. Threat detection is a critical function of AI in cybersecurity. Real-time danger detection via AI-powered systems allows for quick reaction and mitigation. Furthermore, AI is able to change and grow, constantly learning from fresh data and strengthening its capacity to recognize and neutralize new threats. AI in cybersecurity improves vulnerability management, automates responses, and transforms threat detection. Stronger cyber security readiness guarantees that companies can react more quickly and reduce possible effect as threats become more complex. AI improves cybersecurity tactics, enabling proactive defense and protecting sensitive data by evaluating activities, identifying phishing, and adjusting to new threats.

Security experts can identify and reduce risks resulting from AI and cybercrime trends by using AI in cybersecurity to strengthen cyber threat intelligence.

- **Look for signs of cyberattacks:** AI examines enormous amounts of data to find trends and signs of compromise. This study is further strengthened by an understanding of how neural networks operate, which enables AI models to identify minute irregularities that could indicate the beginning of an attack. This method assists security teams in real-time detection of unexpected login attempts, suspicious network activity, and anomalous traffic from IoT devices or endpoints.
- **Boost defenses:** By continuously monitoring systems, AI can assist security teams in isolating infected devices, blocking malicious traffic, and stopping malware. Additionally, it forecasts high-risk locations where breaches are most probable, enabling businesses to proactively fix vulnerabilities before they cause major issues.
- **Analyze user authentication data:** Security teams can utilize AI technologies to examine user authentication data, including speech patterns, typing techniques, and fingerprints. Additionally, they can keep an eye on user activity throughout sessions, spotting irregularities and initiating further verification when necessary.

- **Improve the detection of phishing and spam:** AI scans email messages, attachments, and URLs to stop phishing and spam attempts before they get out of hand.
- **Encourage cooperative threat intelligence sharing:** AI makes it possible for businesses to add to and profit from knowledge that is shared within security groups, strengthening the group's resistance to changing AI-driven threats. For the AI data center, where attack surfaces grow with scale and automation, this intelligence-led strategy is extremely important.

Currently, human interaction is necessary to strengthen cybersecurity. However, AI can automate activities like system monitoring. Organizations will be able to identify new threats more quickly and with more threat intelligence capabilities if the process is automated. As cyberattacks get more sophisticated, this is crucial. Because AI-based cybersecurity automation is based on real-world use cases in a variety of commercial contexts, it is safe. AI is used, for instance, by information technology (IT) and human resources (HR) teams to onboard new hires and give them the tools and access they need to perform their jobs well.

Keywords: algorithms, machine learning, threats, cyber-attacks.



Innovation and Policy Design for Emerging Technologies

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Abstract:

Emerging technologies, such as artificial intelligence, blockchain, biotechnology, quantum computing and autonomous systems, are developing at a pace that is always faster than traditional policy and regulatory processes can respond to. Traditional lawmaking is slow, siloed by sector, and reactive rather than anticipatory in design. None of these qualities can keep pace with technologies whose risks, applications, and societal implications are often not clear even to their own developers at the point of deployment. This paper examines the structural mismatch between linear, precedent-based models of policy design and the iterative, fast-moving nature of emerging technology innovation, and explores alternative regulatory approaches better suited to managing uncertainty.

The paper starts by pointing out the fundamental conflict that lies at the heart of innovation policy: on the one hand there is the requirement to promote technological experimentation and economic competitiveness, and on the other hand there is the need to protect the public interest, safety, and basic rights. If regulation is too prescriptive or introduced too early it may hinder innovation and cause development to move to jurisdictions with more lenient rules, while delays in regulation run the risk of allowing harm to become established before any corrective system is put in place. The

paper looks at this conflict from the point of view of a number of different regulatory approaches, such as precautionary regulation, permissionless innovation, and risk-tiered or proportionate regulatory models, and evaluates the relative advantages and disadvantages of these approaches when they are applied to rapidly evolving technological fields.

A significant portion of the paper is devoted to examining adaptive and anticipatory regulatory tools that have emerged as responses to this mismatch. These include regulatory sandboxes, which allow controlled real-world testing of new technologies under regulatory supervision before full-scale rules are formulated; sunset clauses and periodic review mechanisms that build revision into the legislative design itself; principle-based or outcome-based regulation that avoids rigid technical prescriptions in favor of adaptable standards; and co-regulatory or multi-stakeholder governance models that draw on industry expertise to supplement traditional legislative capacity. The paper evaluates real-world applications of these tools across jurisdictions, considering their effectiveness in balancing innovation incentives with accountability.

The paper further considers the institutional dimension of policy design, examining whether existing regulatory bodies possess the technical expertise, resources, and institutional agility required to govern emerging technologies effectively, or whether new specialized regulatory institutions, advisory bodies, or technology-focused policy units are necessary. It also considers the role of international coordination and harmonization, given that emerging technologies frequently operate across borders in ways that outpace the jurisdictional reach of any single national regulator. The paper concludes by arguing that effective policy design for emerging technologies requires a fundamental shift away from static, technology-specific legislation toward flexible, principle-driven, and continuously evolving regulatory frameworks. It offers a set of preliminary design principles intended to guide policymakers in constructing governance structures capable of fostering responsible innovation while remaining resilient to the pace and unpredictability of technological change.

Keywords: Innovation policy; emerging technologies; regulatory design; adaptive regulation; regulatory sandboxes; technology governance; policy uncertainty.



Cyber Law and Ai-Driven Criminal Justice

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Abstract:

Indian criminal justice is currently witnessing an understated but meaningful change as the use of AI technologies shifts from being merely a support tool to being an essential component in investigations. The examples include the use of facial recognition for identifying suspects through

CCTV images, the use of predictive programs for detecting persons at high risk, and the application of forensic technologies for reconstructing and analyzing digital devices without human involvement. However, no corresponding changes have been made to the legal framework regarding digital evidence which still operates on the assumption that is adequate to the former age of electronic documentation. Specifically, it suggests that any digitally certified document, once proved to be authentic and unchanged, is clear on its own right.

This paper is organized around three questions that arise once AI is inserted into the evidentiary pipeline. First, what happens to the chain of custody and certification requirements under Section 63 of the Bharatiya Sakshya Adhiniyam, 2023 (previously Section 65B of the Indian Evidence Act, 1872) when the "record" being certified is not a static file but the output of a system that has processed, scored, or ranked underlying data? Second, how is the right to a fair trial affected when the defence cannot examine the internal logic of a proprietary AI tool that produced a piece of incriminating evidence — a concern distinct from, though related to, ordinary disputes over expert testimony, since an algorithm cannot be cross-examined the way a human forensic expert can? Third, what happens when an AI tool used in investigation carries forward biases from its training data into decisions about whom to investigate, arrest, or charge, and how would such bias even be detected within the present procedural framework, given that Indian law does not currently require disclosure of a tool's error rates or design methodology?

The present article analyses Indian judicial responses to the reliability and admissibility of electronic evidence, focusing on the principles of certification established in *Anvar P. V. P. K. Basheer* and subsequent case law. The article analyzes whether this judicial doctrine, which has been evolved to regulate conventional electronic evidence, equips the judiciary with sufficient methods to analyze evidence created by adaptive AI technologies. Moreover, the article evaluates the experience of other legal systems in handling similar issues related to algorithmic evidence and predictive policing. The aim of the article is not to transplant the solution from other countries but to learn from their experience what may be used in India.

The paper ends with providing a list of succinct recommendations: the duty of disclosure that is specific to the use of AI-based investigative tools; the standard of documentation that the investigating authorities will have to comply with in case they use an AI tool in generating evidence; and the understanding of Section 63 of BSA which distinguishes mechanical creation of record from its interpretation.

Keywords: Cyber law; digital evidence; Bharatiya Sakshya Adhiniyam; artificial intelligence; criminal justice; algorithmic bias; admissibility.

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Beyond the Firewall AI and Emerging Cyber Threats

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Abstract:

The rapid development of Artificial Intelligence (AI) has fundamentally transformed the digital environment and created new opportunities as well as challenges for cyber security. AI-based systems are increasingly used to detect cyber threats, analyse large volumes of data, identify suspicious behavior, predict security breaches, and automate incident responses. However, the same technological capabilities can also be exploited by cybercriminals to conduct sophisticated and highly targeted attacks. AI-enabled phishing, deep fakes, automated malware, identity manipulation, social engineering, ransom ware, and adversarial attacks have increased the complexity of the contemporary cyber threat landscape. Simultaneously, the growing use of cloud computing, Internet of Things devices, mobile applications, digital payment systems, and interconnected networks has expanded the volume of electronic information generated during cyber incidents. Consequently, digital evidence has become an essential component of cybercrime investigation and adjudication. However, the easily alterable, volatile, encrypted, and distributed nature of digital evidence creates significant challenges relating to authenticity, integrity, reliability, attribution, preservation, and chain of custody. The emergence of generative AI further complicates the distinction between authentic and artificially generated digital content.

This research adopts a doctrinal and analytical methodology based on secondary sources, including legal literature, scholarly research, cyber security frameworks, technological studies, judicial decisions, and relevant legal and regulatory materials. The research also examines emerging technological solutions, including AI-assisted digital forensics, block chain-based evidence preservation, explainable AI, behavioral analytics, zero-trust security architecture, automated threat intelligence, and deep fake detection mechanisms. The study evaluates whether existing legal and technological mechanisms are adequate to address the emerging challenges associated with AI-driven cybercrime.

The research indicates that AI can significantly strengthen cyber security by enabling real-time threat detection, anomaly identification, predictive security analysis, malware detection, automated response systems, biometric authentication, and intelligent digital forensic investigations. At the same time, AI provides cybercriminals with powerful tools for creating more convincing phishing attacks, sophisticated deep fakes, automated social engineering, identity fraud, polymorphic malware, and large-scale cyber-attacks. These developments create substantial difficulties for investigators and courts in determining the origin, authenticity, accuracy, and integrity of digital evidence. AI-generated or AI-manipulated evidence may further complicate traditional evidentiary standards and raise questions concerning algorithmic reliability and accountability. Innovative technologies such as block chain-supported evidence preservation, AI-powered forensic analysis,

explainable AI, and advanced deep fake detection can improve the reliability and efficiency of cyber investigations. Nevertheless, technological innovation must be accompanied by human oversight, transparent procedures, privacy safeguards, and appropriate legal standards. The study concludes that AI represents a dual-use technology that can simultaneously strengthen cyber security and create sophisticated new forms of cyber threats. Effective cyber security therefore requires an integrated framework combining artificial intelligence, digital forensics, legal regulation, ethical safeguards, and institutional cooperation. Strengthening mechanisms for the authentication, preservation, and presentation of digital evidence is particularly important for ensuring fair and effective cybercrime investigation.

Keywords: Artificial Intelligence, Cyber security, Digital Evidence, Cyber Threats



AI and Data Privacy under India's Digital Personal Data Protection Act

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Abstract:

Concerns about the gathering, processing, and use of personal data at a scale and speed that traditional privacy frameworks were not intended to handle have increased due to the quick spread of AI systems in industries like healthcare, finance, and governance. The first comprehensive attempt to codify a rights-based data protection regime in India is the Digital Personal Data Protection Act, 2023 (DPDP Act), which is based on the fundamental ideas of consent, purpose limitation, and accountability. Given that the DPDP Act was not drafted with AI-specific processing activities as its primary concern, this paper investigates the degree to which the statute is capable of addressing the unique privacy challenges presented by AI technologies.

The key question is the architecture of the Act based on consent. The DPDP Act provides that personal data can be processed only for a lawful purpose for which the data principal has given consent or under certain exemptions. However, artificial intelligence systems often depend on large-scale data aggregation, the secondary use of previously gathered datasets, and inferential processing that generates new personal data from existing inputs – actions that are hard to square with a consent framework based on defined, purpose-specific processing. This paper explores whether the Act's conception of consent, and the parallel duties of the data fiduciary, can adequately address the reality of AI training pipelines, where the original purpose of data collection is often not the same as, and broader than, its eventual use for model training.

The paper also analyzes the position of the data subject within the framework of automated decision making. The DPDP Act does provide certain rights to data principals, including the right to correction and erasure, but it does not explicitly provide for a right to explanation or right to contest decisions taken through automated or AI-driven processing as is seen in similar provisions in other jurisdictions. This brings into question the adequacy of individual recourse where an AI system materially impacts a data principal's interests without transparent reasoning.

The paper also analyzes the role of the Data Protection Board of India as the primary enforcement mechanism under the Act, and assesses whether its powers are sufficient to tackle AI-specific harms such as algorithmic bias, opaque processing and cross-border data flows involving AI service providers. The treatment of children's data under the Act which imposes stricter consent and processing restrictions is also considered in the light of AI applications such as personalized recommendation systems and adaptive learning platforms that may process data belonging to minors.

The paper concludes that the DPDP Act establishes a meaningful baseline for data privacy in India, but its general-purpose design leaves several AI-specific gaps which may require targeted subordinate legislation, sector-specific guidelines or future amendment. It provides initial recommendations to bring India's data protection regime more in line with the practical realities of AI-driven data processing.

Keywords: Artificial Intelligence; data privacy; Digital Personal Data Protection Act; consent; data fiduciary; data principal; automated decision-making.

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Smart Law for Smart Societies: Governance in the Age of AI

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Abstract:

A smart society, characterized by interconnected digital infrastructure data driven governance, and citizen centric services requires an equally smart legal framework to sustain it. This paper examines the evolution of smart Law as an adaptive technology enabled legal ecosystem designed for the age of AI. Smart law for smart societies bridges the gap between fast moving digital technology and traditional legal systems by updating regulations to support automated data driven governance while protecting human right. It refers to the evolution of legal frameworks, regulations and governance model designed to match algorithm-centered hyper connected and data driven modern societies. Artificial Intelligence is increasing shaping the modern world, transforming not only technological and economic systems but also the way law and society function. Unlike earlier innovations that

mainly altered physical labour or communication. AI possesses the ability to mimic human reasoning, prediction and decision making. This distinctive feature has created complex legal and ethical debates about how existing frameworks can adapt to govern technologies that often operate beyond direct human control or understanding.

The emergence of AI has initiated a profound shift in the relationship between law and society, creating a landscape filled with both possibilities and risks. AI technologies are increasingly being adopted in legal research, contract analysis, predictive justice, and even in dispute resolution, offering faster outcomes and more efficient use of resources. These innovations open the door to greater accessibility of legal services and the potential for more consistent decision making. Societies and lawmaker therefore face the urgent task of adapting existing legal frameworks and developing new policies that balance innovation with protection of fundamental rights. By fostering accountability, transparency and ethical standards, AI can be shaped into a tool that not only enhances legal processes but also strengthens public trust in justice systems. Ultimately, the age of AI presents an opportunity to reimagine the interaction between law, technology and society in ways that promote equity, efficiency and social progress. Smart society needs digital literacy as a civic right, accessible justice adaptive courts and preservation of human agency. AI is emerging as a defining factor in shaping the future of law and society. It offers remarkable advantages such as greater efficiency, cost reduction and wider access to legal resources, showing how technology can be catalyst for positive change. Since law has always evolved alongside social and technological developments. It must now adapt once more to address the challenges of AI. To conclude AI presents both risks and possibilities for law and society. If guided with care and responsibility, it can reinforce justice, protect democratic values and enhance social progress

Keywords: Smart law, Smart society, Governance, Artificial intelligence, Law and society.



Cyber Law, Digital Evidence and AI-Driven Criminal Justice: Reimagining Legal Governance in the Age of Artificial Intelligence

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Abstract:

India's accelerated digital transformation has fundamentally altered the nature of crime, evidence, and criminal justice administration. The increasing prevalence of cyber offences, including identity theft, online fraud, data breaches, phishing attacks, and AI-enabled cybercrime, has expanded the scope of the Information Technology Act, 2000, particularly Sections 66C, 66D, and 66F governing identity theft, cheating by personation, and cyberterrorism. Simultaneously, Artificial Intelligence

(AI) has become an important tool in law enforcement through predictive analytics, facial recognition systems, automated digital forensics, and risk assessment technologies. These developments have significantly increased reliance upon electronic and digital evidence. India's recent criminal law reforms under the Bharatiya Sakshya Adhiniyam, 2023 recognize this reality by granting electronic and digital records evidentiary status through Sections 61, 62, and 63, which establish admissibility standards for electronic records and computer-generated outputs.

However, while the law adequately addresses conventional electronic evidence, it remains uncertain whether existing provisions can effectively regulate AI-generated or AI-manipulated evidence such as deepfakes, synthetic media, algorithmic profiling outputs, and machine-generated forensic assessments. Recent advisories issued by the Ministry of Electronics and Information Technology (MeitY) in March 2024 acknowledge concerns relating to biased AI systems, misinformation, deepfakes, and unreliable AI-generated content, reflecting the growing need for legal safeguards in the AI ecosystem. Comparatively, the European Union AI Act subjects high-risk law enforcement AI systems to transparency, human oversight, and risk-management obligations, while the UNODC framework emphasizes evidentiary integrity, preservation standards, and chain-of-custody requirements for digital evidence. The analysis demonstrates that India's current framework remains primarily focused on cybercrime regulation and data protection rather than the governance of algorithmic decision-making within criminal justice institutions

Keywords: Cyber Law; Artificial Intelligence; Digital Evidence; Bharatiya Sakshya Adhiniyam, 2023; Algorithmic Accountability.

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Digital Evidence and AI-Driven Criminal Justice

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Abstract:

The rapid digitization of society has fundamentally reshaped the landscape of crime, evidence, and justice delivery, placing cyber law, digital evidence, and artificial intelligence (AI) at the forefront of contemporary criminal justice discourse. Cyber law constitutes the body of statutory, regulatory, and jurisprudential frameworks designed to address offenses such as hacking, phishing, ransomware attacks, data breaches, identity theft, and online financial fraud. Despite continuous legislative reform, cyber law frequently lags behind the pace of technological innovation, struggling to address jurisdictional ambiguities arising from the transnational and borderless nature of cybercrime. Perpetrators often operate across multiple legal territories, complicating enforcement, extradition, and prosecution efforts, and exposing gaps in international cooperation mechanisms.

Digital evidence has emerged as a cornerstone of modern criminal investigations, encompassing data derived from computers, smartphones, cloud storage systems, servers, social media platforms, and Internet of Things devices. Unlike traditional physical evidence, digital evidence is inherently volatile, voluminous, and susceptible to alteration, deletion, or corruption, raising critical concerns regarding its integrity, authenticity, and reliability. Establishing a clear and unbroken chain of custody, alongside standardized forensic protocols for collection, preservation, and analysis, remains essential to ensuring that digital evidence withstands judicial scrutiny and satisfies evidentiary admissibility standards across different legal systems.

Artificial intelligence has increasingly been integrated into criminal justice processes to manage the growing complexity and volume of digital evidence. AI-driven tools facilitate automated forensic analysis, pattern recognition, predictive policing, facial and behavioral recognition, natural language processing for communication surveillance, and risk assessment in sentencing and parole decisions. These technologies offer substantial improvements in investigative speed, accuracy, and resource efficiency, enabling law enforcement agencies to process vast datasets that would otherwise be unmanageable through manual methods. However, the deployment of AI within criminal justice simultaneously introduces significant ethical, legal, and constitutional challenges, including algorithmic bias, lack of transparency in decision-making processes, accountability deficits, and potential infringements on privacy, due process, and the presumption of innocence.

This paper critically examines the convergence of cyber law, digital evidence, and AI-driven criminal justice, exploring how existing legal frameworks must evolve to effectively regulate emerging investigative technologies while preserving fundamental rights and procedural fairness. Employing comparative legal analysis and illustrative case studies from multiple jurisdictions, the study investigates the adequacy of current evidentiary standards for digital and AI-generated evidence, the regulatory mechanisms governing algorithmic accountability, and the safeguards necessary to prevent misuse of surveillance and predictive technologies. The paper further considers the implications of AI-assisted decision-making on judicial discretion and human oversight within the criminal justice process, and evaluates emerging international standards aimed at harmonizing digital forensic practices.

The findings emphasize the pressing need for a harmonized, adaptive, and interdisciplinary regulatory approach that balances technological innovation with judicial integrity, evidentiary reliability, and human rights protection. Collaborative efforts among lawmakers, forensic experts, technologists, and judicial authorities are essential to construct a resilient and future-oriented legal infrastructure capable of addressing the evolving challenges posed by cybercrime and the growing integration of artificial intelligence within modern law enforcement and judicial systems.

Keywords: Cyber Law; Digital Evidence; Artificial Intelligence; Criminal Justice; Cybercrime; Digital Forensics; Algorithmic Bias; Data Privacy; Predictive Policing; Admissibility of Evidence

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Cybersecurity Laws and AI-Based Threats

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Abstract:

The development of artificial intelligence is revolutionizing the world of cybersecurity at a pace that the legal structures have found difficult to keep up with. Artificial intelligence is now utilized in intrusion detection, anomaly detection, and automated responses to incidents; but the same artificial intelligence technology is being used to conduct cyber-attacks of increasing complexity. This includes deep fake social engineering attacks, artificial intelligence-based phishing, machine learning attacks which defeat detection systems and autonomous malware that can dynamically adapt to avoid detection. This makes for a unique regulatory challenge in that the technology developed to improve security systems is simultaneously making attacks easier to conduct.

The following research explores the adequacy of existing cybersecurity legal regulations in the light of AI-related risks, paying attention to the gap that exists between the fast rate of development of technology and the relatively slow pace of regulatory evolution. The existing cyber legislation, which is developed mainly considering human intrusion into computer systems, assumes the existence of a specific human as the agent of a cyber-attack. It becomes more and more difficult in the situations when attacks become automated, self-evolving, or produced using AI with unclear authorship. That is why there arise relevant concerns about the attribution, accountability, and enforceability in relation to AI attacks.

This research performs a comparative analysis of emerging regulatory regimes, with particular emphasis on India's Information Technology Act, 2000, together with the CERT-In guidelines; the EU's AI Act and NIS2 Directive; and relevant American federal guidance on cybersecurity. The purpose of this analysis is to understand the way different jurisdictions have begun to tune their regulatory framework in light of unique AI-related risk profiles. Specifically, this analysis investigates the ongoing appropriateness of the traditional offence-based model of cybercrime regulation, which is based on the concepts of unauthorized access, data theft, denial of service, and so forth, when the agent committing the offence is an autonomous or semi-autonomous artificial intelligence. Moreover, the need for novel regulatory requirements, like mandating red teaming for AI, requiring algorithmic transparency from security-relevant AI systems, and imposing higher due-diligence obligations on creators of dual-use AI applications is considered.

The objective of this paper is an analysis of how artificial intelligence can be increasingly utilized in the domain of defensive law enforcement and compliance, in terms of AI-supported threat intelligence and predictive vulnerability assessment, and how the current laws on data protection and cybersecurity sufficiently support such defense innovation without violating individual privacy rights. It is argued in the conclusion that successful regulation of AI-enabled cybersecurity threats requires the shift from the traditional and inflexible legal framework for incidents to the more

dynamic and principle-oriented approach, which is able to adapt to the changes made by technological progress. The paper provides initial legislative proposals on this issue, such as:

- The development of attribution rules for cyber-attacks enabled by AI;
- The adoption of the design principles for AI cybersecurity systems; and
- Closer cooperation between cybersecurity regulators and AI governance bodies.

Keywords: Cybersecurity law; Artificial Intelligence; AI-based threats; cybercrime; regulation; attribution; data protection



AI and Data Privacy under India's Digital Personal Data Protection Act

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Abstract:

The rapid adoption of artificial intelligence (AI) has transformed the ways in which personal data is collected, processed, analysed and used for decision-making. While AI systems can improve public services, healthcare, finance, education and commercial efficiency, their dependence on large and diverse datasets creates difficult questions of privacy, consent, accountability and individual autonomy. In the Indian context, the Digital Personal Data Protection Act provides an important statutory framework for regulating the processing of digital personal data, but the interaction between data protection and AI raises several questions that cannot be answered through compliance alone.

This paper adopts a qualitative, doctrinal and analytical approach to examine the relationship between AI-driven data processing and the principles underlying India's data-protection framework. It particularly examines meaningful consent, purpose limitation, transparency, data minimisation, accountability and the rights and responsibilities of relevant stakeholders. The study also considers the practical difficulty of applying conventional privacy principles to AI systems whose outputs may depend on complex datasets, automated profiling and continuously evolving models. A key concern is the possibility that individuals may lose effective control over their personal information even where formal consent mechanisms exist.

The paper argues that responsible AI governance in India requires a closer alignment between statutory data protection, institutional accountability and technological design. Privacy should not be treated merely as a procedural requirement fulfilled through lengthy notices or one-time consent.

Instead, privacy safeguards should operate throughout the data lifecycle, supported by transparency, risk assessment, human oversight and effective grievance mechanisms. The study concludes that India's emerging AI ecosystem can remain innovative while respecting informational autonomy only when data protection is integrated into the design and governance of AI systems rather than added as an afterthought.

Keywords: Artificial Intelligence, Data Privacy, DPDP Act, Consent, Accountability, Informational Autonomy, AI Governance



Cyber Law, Digital Evidence, and AI-Driven Criminal Justice

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Abstract:

The increasing use of artificial intelligence, digital platforms and networked technologies has fundamentally changed the nature of crime and criminal investigation. Modern investigations may involve electronic communications, metadata, device records, CCTV footage, cloud-based information, algorithmic analysis and other forms of digital material. At the same time, AI-assisted tools are increasingly capable of identifying patterns, analysing large volumes of evidence and supporting investigative decision-making. These developments create significant opportunities for criminal justice, but they also raise concerns regarding authenticity, reliability, explainability, privacy, procedural fairness and the rights of accused persons.

This paper adopts a qualitative and doctrinal approach to examine the relationship between cyber law, digital evidence and AI-driven criminal justice. It focuses on the evidentiary challenges created by the digital nature of modern information, including questions of collection, preservation, integrity, chain of custody and judicial assessment. The study further examines the implications of relying on AI-generated or AI-assisted analysis where the underlying methodology may be difficult for courts and affected individuals to understand. Particular attention is given to the principle that technological sophistication cannot, by itself, substitute for legally reliable evidence and procedural safeguards.

The paper argues that the future of technology-assisted criminal justice must be guided by a balance between investigative efficiency and due process. Courts and investigating agencies require clear standards for the preservation and verification of digital material, meaningful disclosure of relevant technological processes, and appropriate human oversight over AI-assisted conclusions. The study also highlights the importance of judicial capacity-building so that courts can critically evaluate technologically complex evidence rather than accepting automated outputs at face value. It

concludes that effective cyber law must evolve beyond addressing cyber offences alone and should also establish a rights-sensitive framework for the responsible use, verification and judicial evaluation of digital and AI-assisted evidence.

Keywords: Cyber Law, Digital Evidence, Artificial Intelligence, Criminal Justice, Chain of Custody, Due Process, Judicial Oversight



Global Perspectives on AI Adoption and Digital Inclusion: A Comparative International Relations Analysis of GDPR, and Regulatory Regimes in China and the US

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Abstract:

Now world is seeing a lots of artificial intelligence. Through this has made the governance something that not about the country self-rules but something that effects how the countries work with each other. Whenever the countries want to grow their economies using the intelligence they make rules about protecting their data also they concern about that algorithms are fair are evolving as represents or showing their power in the world. Now many countries look into the model (GDPR) The European Union General Data Protection Regulation. There many scholars known as “Brussels effect”. If talk about this Brussels effect it means that the others countries change their rules and regulation because they want to do business with the European Union. At that juncture, USA has different way of controlling data and china having different ways that are spread out across different areas. How AI is governed around the world by the different way of handling AI of creating 3 groups. Even though developing the multilateral interest in making rules for AI apart from this there is no international framework is present. The literature available only examines about these regimes in isolated way, very narrow way directly shapes bilateral and multilateral diplomatic engagement or cross border data flow agreements. This paper mainly goals to analyse comparatively the (GDPR), cyber security law and (PIPL) personal information protection Law and also understand how they effect on different countries, how AI used around the world. Apart from this paper also wants to look into the about (DPDP) Digital Personal Data Protection Act to see how they might fit into this mix. This study found mainly three paths of handling rules for AI. The study shows a qualitative, comparative policy analysis, on the basis of primary texts (GDPR, DPDP, and PIPL). Then the second literature related to academic literature on digital sovereignty or Brussels effect and policy documents from different bodies like OECD, G20 and UN AI governance initiative. The study compares on the based on four things only: how far their rules reach outside their country

whether they focus more on their government or the people they make sure the rules are followed and what their means for moving the data between their countries. The study of comparative analysis reveals three distinct ways of handling rules for AI. Europe focus on protecting people rights and being careful by using the Europe rights based precautionary model.

China is about making things better and letting the market decide itself. These different ways reasons problems in trade and sharing data among the countries, which became very harder for developing countries that don't have much power in negotiations. The (DPDP) India's framework model demonstrate about the similarities with the model by having rules about getting permissions but also parts that let the government make decision, which is like the Chinese models. This shows about that there is a way for middle powers to deal with rules from big countries. After underlying geopolitical regulatory competition possible with the digital inclusion only. This paper says about middle power can use parts of rules instead of following one set completely. This is a way they can help more people use the intelligence while still keeping their own choices. These findings carry direct relevance for India and Japan unified or collaborative digital governance frameworks. These ideas are crucial for both countries India and Japan both work together on rules, by such through BICON way of working together which can be a model, or offering a template for bilateral cooperation amid global regulatory fragmentation.

Keywords: Artificial Intelligence, Brussels, European Union, Cyber Security, Governance



Artificial Intelligence and the Public Sphere: Transformation of Political Discourse in the Digital Age

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Abstract:

The emergence of Artificial Intelligence (AI), particularly Generative AI (GenAI), is transforming the contemporary public sphere and reshaping how political information is produced, circulated, interpreted and contested. While social media had already weakened the monopoly of traditional media over political communication, AI introduces a new layer of algorithmic mediation. Political texts, images, videos and audio can now be generated, translated, personalised and disseminated rapidly and at relatively low cost. This development creates new possibilities for political participation and access to information, but also raises questions about misinformation, synthetic media, political persuasion, trust and the unequal distribution of communicative power. Recent experimental evidence demonstrates that messages generated by large language models can influence people's policy attitudes, indicating that AI can participate directly in processes of political

persuasion. At the same time, international research and policy literature identifies generative AI as an emerging challenge for information integrity and democratic debate, particularly because synthetic content can be produced and circulated at unprecedented scale. Against this background, the paper examines AI not simply as a technological tool, but as an emerging social force that is altering the conditions under which political discourse takes place.

The study adopts a qualitative, exploratory and conceptual research design based on a systematic review of academic literature, peer-reviewed studies, and reports published by international organisations concerned with AI, democracy and information integrity. The analysis is guided by Jürgen Habermas's concept of the public sphere, supplemented by contemporary perspectives on networked publics, algorithmic mediation and platformisation. Selected documented cases of AI-generated political communication and synthetic media are examined to understand how AI influences political content production, visibility, circulation and reception. Particular analytical attention is given to political persuasion, algorithmic visibility, information credibility, citizen participation and communicative power.

The analysis indicates that AI is producing a significant shift from a predominantly human-mediated public sphere towards an increasingly human–algorithmic public sphere. First, AI lowers barriers to political content creation, potentially allowing citizens and smaller political actors to participate more actively in public communication. Second, algorithmic systems can influence which political narratives become visible and how they reach different audiences. Third, generative AI complicates the distinction between authentic and synthetic political communication, making questions of credibility and trust increasingly important. Recent research showing that LLM-generated messages can produce measurable changes in political attitudes reinforces the significance of AI-mediated persuasion. However, the transformation is not inherently negative or positive: AI may expand participation and access to information while simultaneously creating opportunities for manipulation, disinformation and intensified asymmetries of communicative power. The paper therefore argues that the central issue is not merely whether AI influences political discourse, but how AI is changing the social conditions through which political ideas become visible, credible and consequential.

Strengthening AI literacy, transparency, platform accountability and information integrity will be important for maintaining an open, pluralistic and deliberative public sphere.

Keywords: Artificial Intelligence; Public Sphere; Political Discourse; Algorithmic Mediation;



AI and Data Privacy Under India's Digital Personal Data Protection Act

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Abstract:

The rise of Artificial Intelligence (AI) is both a blessing and a curse to the industries embracing it. AI involves extensive use of data including collecting, analyzing and storing private data about individuals with little or no control of the owners of the data. Due to these risks and others, the Indian government enacted the Digital Personal Data Protection (DPDP) Act. A review of how DPDP will govern the unique problems of AI is the focus of this paper.

A qualitative and doctrinal approach underpins this study. The analysis is built on a review of the pertinent parts of the DPDP Act alongside current literature concerning AI's handling of data, from which insights and findings are drawn. In the discussion that follows, we put the DPDP requirements side by side with the AI life cycle to see how the former will govern the latter's data practices. Our analysis indicates that the DPDP places considerable restrictions on the use of AI data, yet putting these regulations into practice is likely to present its share of challenges. Take for example the need for AI to process and make sense of vast quantities of data in order to function well; this runs counter to the DPDP Act, which mandates that data fiduciaries obtain user consent and have a specific purpose before collecting information. Such stipulations are sure to be difficult to implement since the way AI uses data often exceeds the bounds of the consensual and particular use of personal data the Act envisions.

Then there is the matter of enforcement. The DPDP Act not only has stiff penalties for any infractions but also gives data principals the right to object to processing or have a fiduciary delete their information. What is lacking, however, is any clear direction on how an AI system running on opaque algorithms is to handle such a demand, particularly where the data in question has already been used in training the algorithm. In India, the DPDP Act is a necessary move for the protection and regulation of personal data. But when it comes to AI, some adjustment of the guidelines may be called for. As the Act stands, it would force AI designers to factor data protection laws into their very algorithms, which could stifle development. Any future guidelines for applying these protections to AI would do well to be more explicit in how they deal with the issues at hand.

Keywords: Artificial Intelligence, Industries, DPDP Act, Opaque Algorithms



Innovation and Policy Design for Emerging Technologies

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Abstract:

Emerging technologies are changing the way people live, work, communicate and conduct business. Technologies such as artificial intelligence, blockchain, biotechnology, Internet of Things, autonomous systems and other digital innovations are developing at a very fast pace. These technologies provide many opportunities for economic growth, better public services, innovation and social development. At the same time, their rapid development also creates new challenges for governments, regulators and society. Existing laws and policies are often designed for traditional systems and may not be sufficient to deal with the new risks created by emerging technologies. Therefore, there is a need to rethink the way policies are designed and implemented. This paper examines the relationship between technological innovation and policy design. It focuses on the need to create policies that can support innovation while also protecting public interest. A major challenge for policymakers is to maintain a balance between encouraging new ideas and preventing possible harm. Excessive regulation may slow down innovation and discourage investment, while very limited regulation may result in problems relating to privacy, data protection, discrimination, accountability, competition and consumer protection.

The paper also discusses the importance of anticipating future technological developments while designing policies. Policy decisions should not only respond to problems after they occur but should also consider possible future risks. At the same time, regulation should not be based only on fear of new technology. It should recognise the potential of innovation and create an environment where responsible technological development can take place. The study follows a doctrinal and analytical approach and relies mainly on existing laws, policies, research papers, reports and other secondary sources. It seeks to identify some of the major gaps in present policy approaches and suggests broad principles for developing more effective policies for emerging technologies. The paper concludes that innovation and regulation should not be treated as opposite objectives. A well-designed policy framework can encourage technological development while ensuring accountability, fairness, transparency and protection of public interests. The future of emerging technologies will depend not only on how quickly technology develops, but also on how effectively governments and society design policies to manage that development.

Keywords: Emerging Technologies; Innovation Policy; Adaptive Regulation; Regulatory Governance; Public Interest.



Intelligent Rearing for Predictive Pest Management: A FAIR, AI-Ready Synthesis of *Spodoptera frugiperda* Performance on Cabbage

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Abstract

Spodoptera frugiperda (fall armyworm, FAW) is a polyphagous, invasive pest whose host-use plasticity complicates AI-driven integrated pest management (IPM) and the design of intelligent laboratory rearing pipelines for biocontrol and resistance management. Although maize is the primary host, robust, machine-readable characterisation of FAW performance on alternative hosts such as cabbage (*Brassica oleracea*) is essential for building generalisable predictive models of pest dynamics and for generating high-quality training data for decision-support systems.

This review systematically synthesises controlled-rearing studies of *S. frugiperda* on cabbage, extracting structured features for modelling: stage-specific survival, development-time distributions, pupal mass trajectories, and diet-quality metrics (crude protein, dry matter, defensive metabolites such as chlorogenic acid). Aggregated evidence shows that cabbage sustains early instars but is a suboptimal host relative to maize, castor bean, or soybean, with survival of 0–66% (protocol- and cultivar-dependent), prolonged larval development, and reduced pupal mass. We interpret these biological constraints as feature-engineering priors and domain-knowledge regularisers for machine learning (ML) models of host suitability, and we outline how standardised, interoperable rearing datasets can be integrated into multi-task learning frameworks, digital-twin simulations of FAW population dynamics, and reinforcement-learning-based IPM policy optimisation.

We further identify critical data gaps—sparse cultivar environment coverage, limited longitudinal trait tracking, and inconsistent metadata—and propose a FAIR (Findable, Accessible, Interoperable, Reusable) data scheme for cabbage-based FAW rearing experiments. This scheme is designed to feed predictive pest-forecasting pipelines, generative models for synthetic phenotype generation, and edge-AI decision-support tools for real-time IPM. By aligning empirical entomology with modern AI/ML workflows, this work advances intelligent, predictive agricultural ecosystems in which biological knowledge is encoded as computational priors for scalable, adaptive pest-management intelligence.

Keywords: Fall armyworm, integrated pest management (IPM), Predictive pest modelling, FAIR data, Machine learning.





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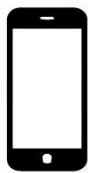
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