ETHICAL ANALYSIS AND PROJECTIONS OF AI IN EDUCATION

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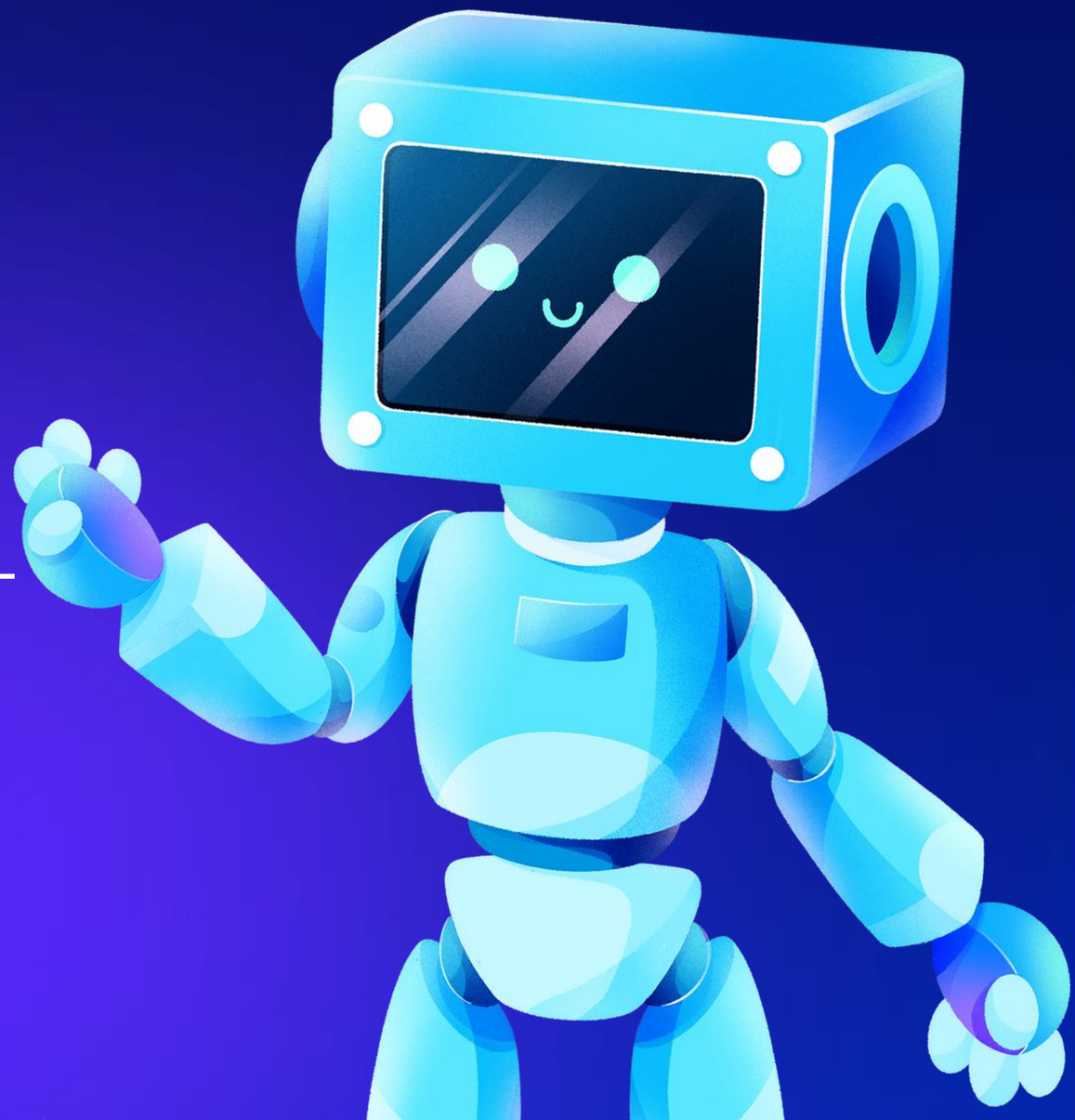


OVERVIEW

AI has the potential to revolutionize education by

1. Enhancing learning procedures,
2. Increasing administrative effectiveness,
3. Improving academic results.

But there are also important ethical issues raised by this technical breakthrough that need to be resolved, such as:

1. Increased productivity against worries about data privacy,
2. Issues regarding the use of copyrighted information by AI systems, and
3. The justice and openness in AI algorithms.

Due to this complicated environment, implementing AI in educational contexts requires careful consideration and moral behavior with the right regulations and policies.

RESEARCH PAPERS

Citation: Pedro, F. et al. (1970) Artificial Intelligence in education : Challenges and opportunities for Sustainable Development, DSpace Home. Available at: https://repositorio.minedu.gob.pe/handle/20.500.12799/6533 (Accessed: 23 May 2024).

RESEARCH PAPER ANALYSIS

AI is revolutionizing education by providing fresh approaches to both teaching and learning. But putting AI into practice requires sophisticated infrastructure, which presents difficulties for developing nations. In order to inform suitable policy responses, the publication attempts to educate education policymakers about AI's effects on education

- **Improving Learning Outcomes**: AI can enhance educational equity and quality through personalized learning and better data analytics in educational management.
- **Preparing Learners:** Educational programs must evolve to equip learners with skills for an AI-dominated future.
- **Challenges and Policy Implications:** Identifies six key challenges that need addressing to integrate AI in education effectively.

SECTION I: LEVERAGING AI FOR LEARNING AND EQUITY

- AI in Education
- Data Analytics in Education Management

SECTION II: PREPARING LEARNERS FOR AN AI FUTURE

- Curriculum Development
- Computational Thinking Initiatives
- AI Capacities Strengthening

SECTION III: CHALLENGES AND POLICY IMPLICATIONS

- Policy Development
- Data Collection
- Research and Ethics

ETHICAL IMPLICATIONS

CONSEQUENTIALIST VIEW ON LLM IN EDUCATION

Potential Benefits

- **Improved Learning Outcomes:** Personalized instruction enhances academic performance and equity.
- **Increased Efficiency:** Streamlines administrative tasks, improving management and freeing up teaching time.
- **Skill Development:** Boosts digital literacy and prepares students for an AI-driven future.

Potential Harms

- **Privacy Concerns:** Extensive data collection raises risks of unauthorized access and misuse.
- **Educational Inequality:** Risk of widening gaps if AI tools aren't accessible to all; equitable access is crucial.
- **Over-Reliance on AI:** May hinder critical thinking; balance with traditional methods is essential.

DEONTOLOGICAL VIEW ON LLMS IN EDUCATION

Moral Principles

- Fairness and Transparency: AI algorithms must be unbiased, and decision-making processes must be clear and justifiable.
- Privacy Protection: Protect student privacy with explicit consent, anonymization, and data access/deletion rights.
- Equitable Access: Ensure all students have equal access to AI technologies to prevent educational inequalities.

ETHICAL IMPLICATIONS FOR STAKEHOLDERS

Policymakers

- Enforce regulations for fairness, transparency, and privacy.
- Ensure equitable access to AI across schools.
- Continuously evaluate and adjust AI policies.

Educators

- Balance AI with traditional methods.
- Participate in AI training programs.
- Maintain transparency with students and parents.

Learners

- Understand AI's impact on learning and privacy.
- Use AI tools responsibly.
- Provide feedback to improve AI technologies.

Comprehensive Approach

Combining both frameworks ensures AI in education maximizes benefits and adheres to essential moral principles, fostering a just and effective educational system.

PROJECTIONS & UNINTENDED

LIMITATION OF AI IN USING COPYRIGHTED INFORMATION

Limitations on AI Using Copyrighted Information:

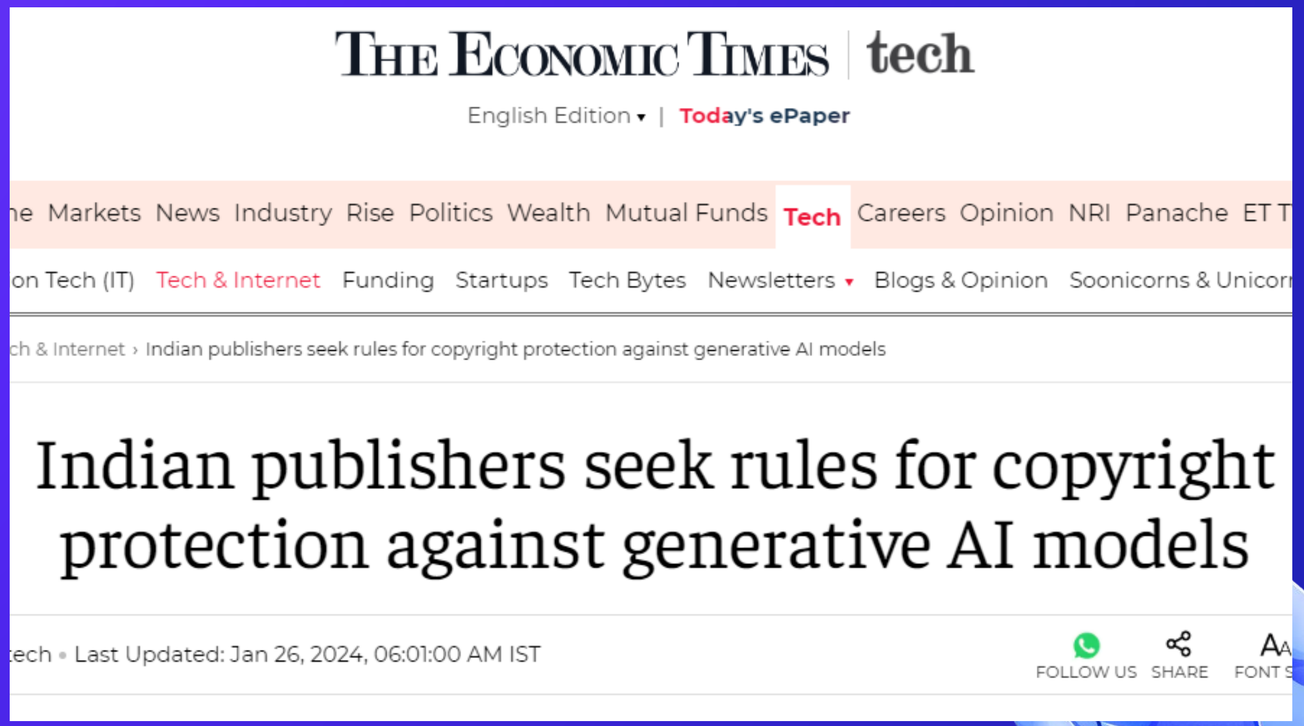
- Restricted Access to High Quality Content
- Development and Training Challenges
- Legal and compliance costs
- Stifled Innovation

Benefits When AI Can Use Copyrighted Information:

- Enhanced Content Quality
- Advanced AI Training

RECENT ARTICLE

According to a recent article in The Economic Times, Indian publishers are seeking stricter rules for copyright protection against generative AI models (The Economic Times, 2024)



DANGER OF ENLARGING THE EDUCATIONAL GAP

Issues

- Economic Disparities
- Technological Infrastructure
- Teacher Training and Support

Strategies for Equitable Access

- Public - Private Partnerships
- Community and Non-Profit Initiatives

Implications if not implemented

- Widening Educational Disparities
- Socio-Economic Impact
- Reduced Social Mobility

LACK OF HUMAN INTERVENTION COULD AFFECT STUDENTS' LEARNING CURVE

Issues:

- Loss of personal touch & human interaction
- Resulting in overreliance on AI leading to shallow learning.

Prevention Strategies:

- Balancing AI with Human Involvement/ active Teacher Engagement
- Promote self-assessment, digital literacy, and active teacher guidance.

Implications if Ignored:

- Isolation and Motivational Decline
- Hindered critical skills, increased cheating, and weakened cognition.

COLLECTING AND STORING STUDENT DATA RAISES SIGNIFICANT PRIVACY CONCERNS

Issues:

- Privacy Concerns in Student Data Collection and Storage
- Ethical Use of Student Data

Strategies for Prevention:

- Ensuring Data Security
- Implementing Ethical Data Practices
- Transparent Data Collection Policies

Implications if not Implemented:

- Compromised Student Privacy
- Misuse of Student Data
- Loss of Trust in Educational Institutions

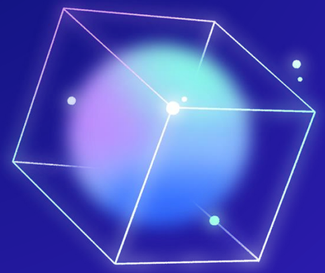
PROPOSED REGULATIONS

Regulation	Objective	Key Provisions	GDPR Articles + Added Value
Copyright Compliance: AI Training Data Review Board	Ensure lawful use of copyrighted information in AI datasets.	• AI Training Data Review Board. • Dataset submission and review. • Transparency and accountability.	• 6, 22 • Specific oversight of intellectual property use.
Equitable Access: Funding allocation, tech-equity partnerships	Provide equitable AI access in education.	• Funding allocation to underserved schools. • Tech-equity partnerships. • Standardized AI curriculum.	• None specific, Article 5(1)(a) related. • Focus on educational equity.

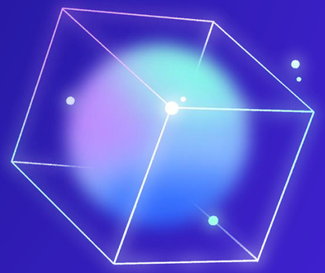
Regulation	Objective	Key Provisions	GDPR Articles + Added Value
Maintaining Human Interaction: Hybrid teaching models	Maintain human interaction in AI education.	• Hybrid teaching models. • Emotional AI integration. • Teacher support programs.	• None specific • Focus on human interaction in education.
Data Privacy: Content, Anonymyzation, Audits	Protect student data privacy	• Explicit consent requirement. • Data anonymization standards. • Third-party audits. • Data access and deletion rights.	• 7, 15, 25, 32, 33. • Specific focus on student data privacy.

AGENTIC LLM FRAMEWORK

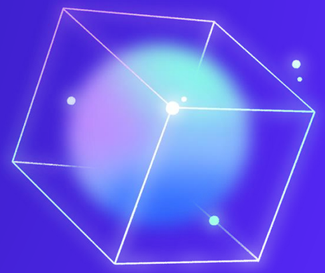
AGENTS IN LLM MODEL



Student Context Collector

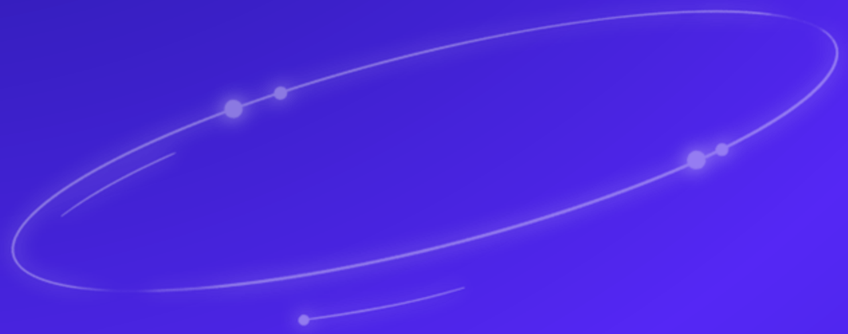


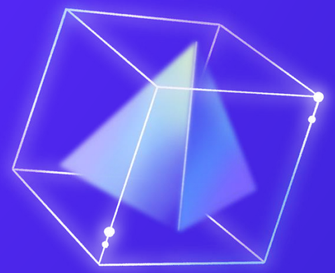
Subject Topic Specifier



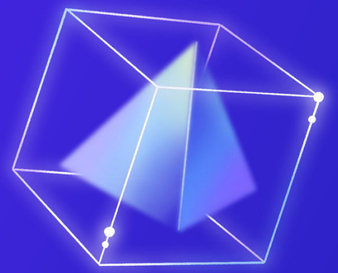
Topic Helper

TASKS CREATOR IN LLM MO

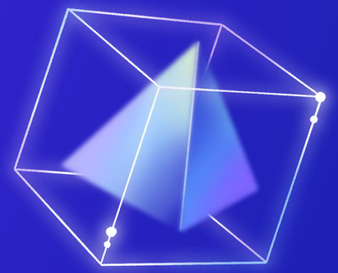




Collect Context



Specify Topic



Provide Help

EVALUATE THE EFFECTIVENESS AND ALIGNMENT OF STUDY ASSISTANCE PLANS GENERATED BY AN LLM FOR DIFFERENT EDUCATIONAL NEEDS

Environmental Science

Prompt: Plan a detailed study assistance session covering ecosystems, biodiversity, pollution, and sustainable practices for a high school student.

- Narrowly focused on climate change.
- Partial alignment
- Detailed but limited in scope

Accounting Principles

Prompt: Plan a study session covering basic accounting principles, including examples, for a second-year college student with a learning disability.

- Focused on a specific principle with practical examples
- Good alignment
- Detailed and focused

War in Ukraine

Prompt: Plan a session covering the historical background, key events, major players, and impact on global politics and economy for a second-year college student with a learning disability.

- Covered full scope of the prompt.
- Good alignment
- Broad and detailed

THANK YOU!