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# YOJANA

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## 1. ARTIFICIAL INTELLIGENCE: CHALLENGES AND OPPORTUNITIES FOR INDIA

- Artificial Intelligence can be defined as a system's ability to learn and interpret external data via software/algorithms or machines/devices for problem solving by performing specific roles and tasks currently executed by humans.
- The origin of term AI can be traced back to early 1950s, the relatively recent advancement in information technology (like big data, improved computing, and storage capability and super-fast speed of data processing machines) and robotics has enabled AI to gain significant momentum in terms of its development and applications.

### Opportunities and Applications:

#### 1. Education:

- ✓ AI can be deployed to improve teacher effectiveness and student engagement by offering capabilities such as intelligent game-based learning environments, tutoring systems and intelligent narrative technologies.
- ✓ It helps in developing student specific learning profile and in developing customised learning environments based on ability, preferred mode of learning and experience.
- ✓ The use of smart assistants (Amazon Alexa, Google Home, and Apple Siri) and associated technologies offer significant potential to help students.
- ✓ AI systems can assist educators with secondary tasks such as grading activities, providing personalised responses to students, handling routine and repetitive paper work and dealing with logistics-related matters.
- ✓ India has about 50% less teachers per thousand students when compared with developed country (India 2.4/thousand vs UK 6.3/thousand). This shows that scope of AI in education sector is immense.
- ✓ The TN government is implementing use of AI through face recognition for recording attendance. The system is freeing up extra time for core educational activities in schools.

#### 2. Health:

- ✓ AI can help in achieving good health and well-being within rural and remote areas in developing countries where access to medical care is limited.
- ✓ India has **0.8 per thousand doctor-to-patient ratio (UK 2.8, Australia 5, China 4)**. This low ratio implies a heavy workload on Indian doctors. AI could be a valuable assistive tool for doctors in helping reduce their workload and assisting in diagnosis.
- ✓ AI can be utilised for conducting remote diagnosis supporting doctors to help improve health service delivery.

### 3. Agriculture:

- ✓ The per hectare cereal productivity in India is almost half that of China and UK (3000 kg/ha vs. 6000 kg/ha). There is a significant loss of productivity due to pests and diseases.
- ✓ AI algorithm based mobile app can be used to identify the pests or disease and sends a message to the farmer advising the remedial measure.

### Challenges and Shortcomings:

1. **Lack of Explainability** – AI does not transparently provide the reasoning behind a particular decision, classification or forecast made by the systems. This has a direct impact on trust and confidence of using decisions made.
2. **Lack of contextual awareness and inability to learn** – AI based systems are good at performing with given parameters and rules. Unlike human, AI based systems cannot learn from their environment.
3. **Lack of Standardisation** – different data and lack of quality data poses a serious concern regarding the functioning of AI.
4. **Job Losses** – increasing automation will lead to significant job losses particularly at operation and lower skill levels for repetitive tasks.
5. **Lack of competency and need for re-skilling and up-skilling workers** – a large number of organisations still lack in-house competency to successfully develop and implement AI-based systems.
6. **Lack of trust and resistance to change** – due to various issues people are generally apprehensive about its implementation.
7. **Digital Divide and Data Deficit** – AI revolution has data at its foundation, there is a real danger of societies being left behind. Countries where the data is of poor quality would be left behind in harnessing the power of AI to improve lives of its citizens adversely affecting low-resource communities.
8. **Fairness and Equity** – AI can disrupt social order and hierarchy creating social paradigms, which could damage the social fabric exposing people lower in the bargaining hierarchy with a real threat of exploitation and unfair treatment.
9. **Accountability** – once machines are equipped with AI and take autonomous decisions, the question of accountability becomes very hard to answer.
10. **Misuse Protection** – internet proliferated benefitted the billions but also carried along with it a wave of cybercrime, malware, viruses and violent online games which resulted in loss of innocent lives of teens around the world. Autonomous AI systems must be designed for misuse protection.

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### Conclusion:

- AI as a technology holds tremendous potential for a country like India, which is data rich and has the requisite technological capability to create AI solutions for many of its problems.
- An effective public policy framework for AI along with a practical scorecard would be needed to make this AI revolution work towards an equitable prosperity.

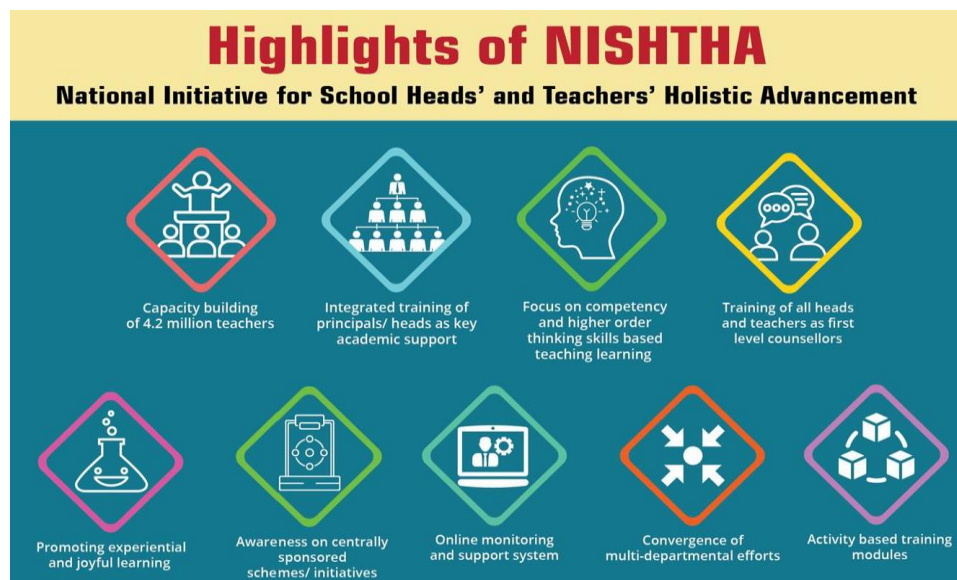


## 2. KEY INITIATIVES IN EDUCATION

### Key Reforms in School Education:

#### 1. National Initiative for School Heads and Teachers Holistic Advancement (NISHTHA):

- ✓ It has been launched to build capacities for elementary school level teachers, principals, block resource centre coordinators and cluster resource centre coordinators.
- ✓ The basic objective is to motivate and equip teachers to encourage and foster critical thinking in students.
- ✓ Teachers will get awareness and develop their skills on various aspects related to Learning outcomes, pedagogy, inclusive education, ICT in teaching, etc.



#### 2. Pradhan Mantri Innovative Learning Programme-DHRUV:

- ✓ It was launched to identify and encourage talented children to enrich their skills and knowledge.
- ✓ It will acts as a platform to explore the talent of outshining and meritorious students and help them achieve excellence in their specific areas of interest, may it be science, performing arts, creative writing, etc.
- ✓ It was launched by Ministry of Human Resource Development.

#### 3. Shagun:

- ✓ It is one of the world's largest Integrated Online junctions for – school education.
- ✓ It is an over-arching initiative to improve the school education system by creating a junction for all online portals and websites relating to various activities of school education.



#### 4. Diksha:

- ✓ It was launched in 2017 for providing digital platform to teachers giving them an opportunity to learn and train themselves and connect with teacher community.
- ✓ It has taken forward to enhance coverage and improve the quality of e-content for teachers.

#### Operation Digital Board:

- Its aim is to provide by March 2023, two smart classrooms for every secondary/Senior Secondary schools in government and aided schools in all states/UTs.

#### Key Reforms in Higher Education:

##### 1. Five-year vision plan 'Education Quality Up gradation and Inclusion Programme' (EQUIP):

- ✓ It aims at ushering transformation in India's higher education system by implementing strategic interventions in the sector over 2019-24.
- ✓ It sets out to deliver on principles of access, inclusion, quality, excellence and enhancing employability in higher education.

##### 2. Institution of Eminence (IoE):

<i>Highlights of the scheme</i>		
<ul style="list-style-type: none"> <li>• Public-funded institutions will get financial assistance of ₹1,000 crore for five years</li> <li>• Private institutions which gets the tag will have complete autonomy</li> <li>• Total of 20 institutions will be selected. Of which 10 will be public funded</li> </ul>	<ul style="list-style-type: none"> <li>• Within five years after getting Institutions of Eminence tag, they must be recognized in global ranking framework</li> <li>• Must be recognized within top 100 at global level</li> <li>• Institutes to deposit ₹1 crore as processing fee</li> <li>• Private institutions should</li> </ul>	<ul style="list-style-type: none"> <li>have ₹5,000 crore of net worth, including all the members of trust or foundation</li> <li>• If it is already a university, then they should have ₹3,000 crore</li> <li>• This is a vision of Prime Minister Narendra Modi to improve quality of higher education</li> </ul>

##### 3. MOOCs on SWAYAM Platform:

- ✓ It is an integrated platform for offering online courses and covering school (9th to 12th) to Post Graduate Level.
- ✓ The online courses are being used not only by the students but also by the teachers and non-student learners, in the form of lifelong learning.

##### 4. SWAYAM PRABHA DTH-TV channels: it is for transmission of educational e-contents through 32 National Channels.

- Implementation of quality improvement programme:
  - ✓ Learning outcomes based curriculum framework to facilitate universities to revise the curriculum.

- ✓ Use of ICT based learning tools for effective teaching learning process
- ✓ Scheme for Trans-disciplinary Research for India's Developing Economy (STRIDE) – promoting quality research by faculty and creation of new knowledge.
- ✓ PARAMARSH- a scheme to mentor institutions seeking National Assessment and Accreditation Council accreditation.





### 3. CYBERSECURITY: ISSUES AND CHALLENGES

- The world we live in is highly connected and digitally exhaustive. Today, social network have become one of the main communication channels. Within relatively short time social media has empowered people and connected them.
- But at the same time, they have also provided platforms for some decidedly unhealthy and destructive behaviour. Social media platforms have become just one of the endless data channels that cybercriminals are exploiting.

#### Various types of Cyber Attacks:

##### 1. Bots:

- ✓ A bot is a software application that is programmed to do certain tasks. Bots are automated, which means they run according to their instructions without a human user needing to start them up. Bots often imitate or replace a human user's behaviour. Typically they do repetitive tasks, and they can do them much faster than human users could.
- ✓ In this age of misinformation, bots possess the power to hijack a conversation, troll someone, promote propaganda and even cause security issues.

##### 2. Terrorist Attacks:

- ✓ Extremists use the social media to use it to recruit, propagate and to connect. Moreover, they rely on the regular social media users to spread the impact of terror further to a greater degree.
- ✓ Misinformation, the rapid spread of false information through social media is among the emerging risks. Fake news and rumours is increasingly used for militancy.
- ✓ Social networking sites today are playing an important role in counter-terrorism operations. The law enforcement authorities make good use of the social media by keeping people informed regularly.

##### 3. Distributed Denial of service (DDoS):

- ✓ Here, the intruder is not interested in actually stealing your information but in bombarding your server with unnecessary traffic thereby crashing it.
- ✓ Huge servers like video streaming apps and majority of banks are under this type of attack. Any device that can connect to the internet can be breached.

##### 4. Ransomware:

- ✓ This ransom demanding malware is a virus which gets into your computer, either when you download an attachment containing the virus or when you visit any such website and click on the link.

- ✓ Once it gets into your computer, it starts to encrypt all your files thereby rendering them useless. The only way to unlock your files is to get a secret key from the hacker by paying a ransom.

5. **Internet of Things (IoTs)** – in this every object we use is equipped with the capabilities to identify, locate, sense its surroundings, compute and communicate. Now what will happen if all these objects could talk to each other and share information?
6. Not only are we living in a highly connected world but also in a world that is highly mobile, given the number of apps that we use on a daily basis. All the apps we used collected a lot of information from our phone. This data can be used to execute large-scale phishing attacks.

### Protection against Cyber Attacks:

1. Limit the amount of information that you disclose on the social networking sites
2. Do not establish friendship with strangers
3. Do not believe online information blindly as it can be misleading
4. Customise your systems settings according to your needs by changing the default settings.
5. Beware of third-party applications. Avoid applications that seem suspicious, and make sure to modify your settings to limit the amount of information which the applications can access.
6. Secure your system, because unsecured network can lead to loss of your personal data
7. Use antivirus software to secure your computers and electronic devices
8. Choose suitable authentication scheme so that no one can access the details. Two-factor and multi-factor authentication should be in place. In two-factor authentication along with username and password, another form of identification, often a security code in the form of a “Captcha” is used. In multi-factor authentication, more than one form of authentication like facial recognition, iris recognition, voice ID and finger scanning.

### Conclusion:

- Digital literacy consists of developing new skills and knowledge which provides awareness and advancement level thinking skills. It is extremely essential to be digitally literate for appropriate utilisation of digital information resources.

#### 4. GLOBAL SYNERGY IN HIGHER EDUCATION

- The need for quality, relevance and employability are integral components of any discourse on higher education, driven by access, equity and affordability.
- India aims to become a five trillion economy by 2024-25; the realisation of this goal is incumbent upon the capability of its education and training institutions to equip young Indians with knowledge and skills relevant to an evolving job market.
- India's draft National Education Policy aims at increasing the **gross enrolment ratio (GER) in higher education to at least 50 per cent by 2035. The current GER stands at just 26.3%** and doubling it in the next 15 years will require significant reforms at planning and execution level. **India's GER is lower than the global average of 36.7%.**

#### Higher Education – Critical Challenges for India:

- India enjoys a demographic dividend. It is world's youngest country with an **average age of 29**. This opportunity is also a challenge. The Indian youth need education and skills, and the current Indian system has to be well equipped to handle it.
- Private colleges cater to 66.4% of the total enrolment in higher education. Merely 22% of government colleges are catering to a disproportionately large number of poor students who could not afford to seek in private institutions.
- Increasing social aspirations have made the education divide between urban and rural centres more obvious. **The opportunity cost of higher education (commute, hostel fees etc.) for disadvantaged section is often too high** and hinders the education process.
- **Low employability of graduates, poor quality of teaching, weak governance, insufficient funding and complex regulatory norms** continue to affect the Indian higher education sector.
- India caters to less than one per cent of all international students. Only approximately 47,000 foreign students were enrolled in the Indian higher education system. This number stands at more than 4 lakhs in china, 3 lakhs in Germany.
- The outflow of Indian students for education abroad is itself more than 15 times the inflow of international students to India.

#### Initiatives taken by Government for Global Synergy in Higher Education:

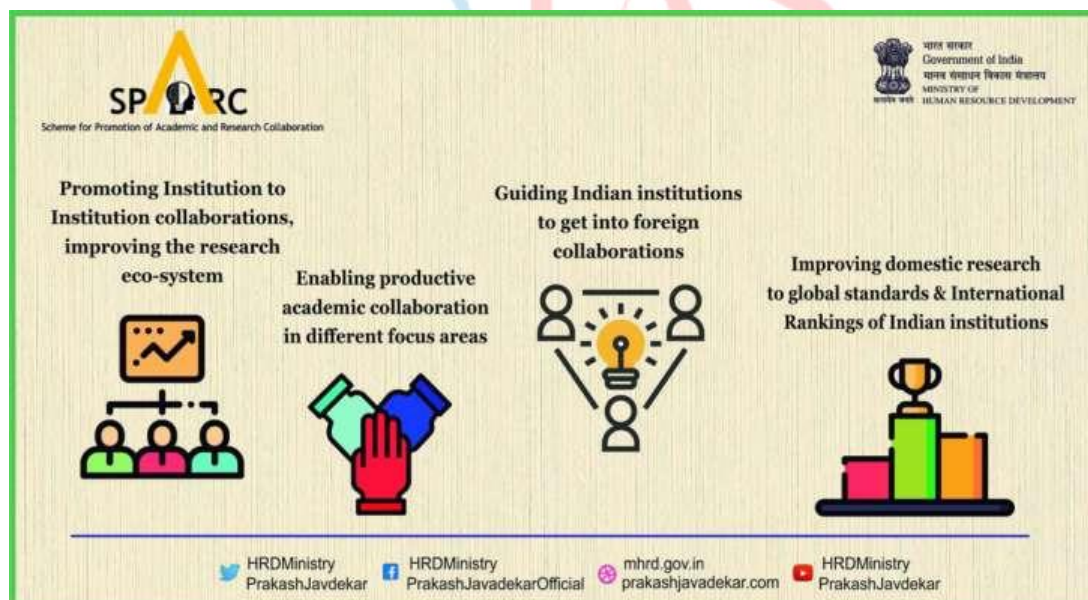
- ✓ Recently released draft National Education Policy 2019 proposes inviting the top 200 global universities to establish foreign branch campuses in India.
- ✓ The Ministry of Human Resource Development has developed a Five-year vision plan 'Education Quality Up gradation and Inclusion Programme' (EQUIP):
- ✓ It aims at ushering transformation in India's higher education system by implementing strategic interventions in the sector over 2019-24.

- ✓ It sets out to deliver on principles of access, inclusion, quality, excellence and enhancing employability in higher education.
- NITI Aayog recently favoured the development of Exclusive Education Zones (EEZs) akin to SEZs in few select cities to boost growth in the inflow of foreign students.
- Linkages between higher education institutions and industries with diversified course offerings can prepare students for the job market.
- Global education institutes may also consider looking at building partnerships, beyond HEIs in metro cities to Tier 2 and Tier 3 cities, which offer tremendous possibilities because of large number of students with untapped potential and lack foreign collaborations currently.

### Global Initiative of Academic Networks (GIAN)

- Aims at improving the quality of higher education in the country through international collaboration. Facilitate participation of high quality international academicians for delivering short-term courses and programs in Indian institutions
- Initially 500 international faculties will be engaged in conducting courses and later in subsequent years 1000 faculties would be engaged under GIAN throughout India
- These courses will be webcasted live for students across the country through web portal designed by IIT Kharagpur.

### Scheme for promotion of Academic and Research Collaboration (SPARC):



### Conclusion:

- The education landscape is changing vigorously. So increased focus on vocational and profession led education can help India find ways to up-skill 400 million workers by 2022.



## 5. QUALITY EDUCATION FOR WEAKER SECTION AND DISADVANTAGED GROUPS

- The Right of Children to Free and Compulsory Education (RTE) Act, 2009, entitles every child of age 6 to 14 years to a right to free and compulsory education in a neighbourhood school till completion of elementary education.
- Section 8(c) of the RTE Act, provides that the appropriate government would ensure that the child belonging to weaker section and belonging to disadvantaged group are not discriminated against and prevented from pursuing and completing elementary education on any grounds.

### Steps Taken to Ensure Education of Children with Disability:

#### 1. Samagra Shiksha:

- ✓ It subsumes three earlier centrally sponsored schemes i.e. Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and Teacher Education and has been recently launched as an Integrated Scheme for School Education extending from pre-school to class XII.
- ✓ Under this, provision has been made for giving preference to Special Focus Districts, Educationally Backward Blocks, LWE affected districts, and aspirational districts while planning intervention like setting up of primary schools, upper primary schools, construction of additional classrooms, toilets, etc.
- ✓ It also focuses on improvement in quality of education by providing support for different interventions like in-service training of teachers and school heads, grants for library, sports and physical activities, support for ICT and digital initiatives, etc.

#### 2. The 'Padhe Bharat Badhe Bharat' Scheme:

### Padhe Bharat Badhe Bharat Abhiyan

#### A Nationwide sub-programme to the Sarva Shiksha Abhiyan planned in a twin track approach

- To improve language development by creating an enduring interest in reading and writing with comprehension
- To create a natural and positive interest in mathematics related to the physical and social world

### 3. The Navodaya Vidyalaya Scheme:

- It provides of opening of one JNV in each district of the country to bring out the best of rural talent.
- Its significance lies in the selection of talented rural children as the target group and the aim to provide them quality education comparable to the best in a residential school system.

### Promoting Vocational Educational in Backward Regions:

- Developing internship/apprenticeship based degree courses in sector like Retail, Logistics, Media and Entertainment, etc.
- Increasing number of institutions offering B.VoC courses in the country
- Aligning the content of existing skill courses with National Skill Qualification Framework (NSQF)

### Facts for Prelims:

- **Pradhan Mantri Innovative Learning Programme-DHRUV:**
  - ✓ It was launched to identify and encourage talented children to enrich their skills and knowledge.
  - ✓ It will acts as a platform to explore the talent of outshining and meritorious students and help them achieve excellence in their specific areas of interest, may it be science, performing arts, creative writing, etc.
  - ✓ It was launched by Ministry of Human Resource Development.
- **Young Scientist Programme (Yuvika):**
  - ✓ ISRO has launched a special programme for School Children called “YUva VIGyani Karyakram”
  - ✓ The Program is primarily aimed at imparting basic knowledge on Space Technology, Space Science and Space Applications to the younger ones with the intent of arousing their interest in the emerging areas of Space activities.
  - ✓ The program is thus aimed at creating awareness amongst the youngsters who are the future building blocks of our Nation. ISRO has chalked out this programme to “Catch them young”.

### Scheme for promotion of Academic and Research Collaboration (SPARC):

- ✓ Aims at improving the research ecosystem of India’s Higher Educational Institutions by facilitating academic and research collaborations between Indian Institutions and the best institutions in the world.
- ✓ Indian Institute of Technology Kharagpur is the National Coordinating Institute to implement the SPARC programme.
- ✓ It was launched by Ministry of Human Resource Development.