

FROM CLASSROOMS TO SCREENS: FUTURE OF LEARNING WITH DIGITAL EDUCATION

The complexity in education is a rising challenge, with rigidity and slow adaptation posing obstacles. Educators and learners face constant change, growing competition, global expansion, and outsourcing in a turbulent world. The history of technology in education spans decades, from audio-visual aids to computers and the internet, transforming education by incorporating visual and auditory elements into the classroom.

- In the 1950s and 1960s, television sets became more accessible, leading to the emergence of educational television programs. Educational broadcasting allowed students to access educational content from their homes, expanding learning opportunities beyond the classroom.
- The 1970s saw computers revolutionize education. Despite their size and cost, they enabled computer-assisted instruction (CAI) with programs like PLATO for interactive, personalized learning.
- The 1990s internet revolutionized education with online learning platforms, virtual classrooms, and collaborative tools, making distance learning accessible and global resources available to students.
- Advancements in technology integrated multimedia elements like graphics, videos, and simulations into educational software, boosting engagement and interactivity. Tools like online discussion boards and video conferencing enhance collaboration and remote learning.

These milestones demonstrate how technology has evolved and become increasingly integrated into educational practices, empowering educators, expanding access to knowledge, and transforming the learning experience for students worldwide.

It is important to define the terms: EdTech and Digital learning.

- EdTech encompasses technologies, hardware, software, services, and digital resources that enhance teaching, learning, and facilitate education management and operations.
- Digital learning involves using digital technologies for teaching and learning, whether online or offline, in distance, hybrid, or in-person modalities.

In the early 20th century, Thomas Edison promoted mechanical instruction using motion pictures, claiming textbooks were only "two percent efficient." Despite his vision for "visualized education," he failed by not collaborating with teachers.

The Rise of Digital Education

- The rise of digital education stems from rapid technological advances. Computers, the internet, and mobile devices enable new educational experiences, including online courses, virtual classrooms, educational apps, multimedia content, and interactive simulations.

Facets of digital education

Digital education offers numerous benefits that have contributed to its growing popularity.

- Digital education enhances accessibility and inclusivity by breaking geographical barriers, enabling learners with limited access to traditional education to engage in lifelong learning and flexible education through online courses and virtual classrooms.
- Secondly, digital education promotes personalised learning experiences. With digital tools, educators can tailor instruction to individual student needs, providing targeted support and adaptive learning pathways. This personalised approach maximises student engagement and academic success.
- Digital education fosters interactive learning through multimedia elements like videos and simulations, making education dynamic and immersive. Students actively participate, experiment, and explore concepts, enhancing their understanding and critical thinking.

Digital education offers many benefits but faces challenges like the digital divide, which limits access to technology and internet connectivity. Addressing this requires efforts to improve infrastructure, affordability, and accessibility.

Transforming Learning Experiences

- Digital education transforms learning by promoting active, self-directed experiences. Students explore resources, collaborate, and solve problems, fostering lifelong skills. It also allows for personalized assessments and feedback, using data to tailor instruction and support continuous growth.

The Role of Educators in Digital Education

- In digital education, educators are essential as facilitators and mentors. They provide guidance, support, and expertise, helping students navigate digital resources, develop critical digital literacy, and understand ethical considerations, while fostering collaboration, critical thinking, and social-emotional skills.

Future Directions and Implications

- The future of digital education is promising, with AI, VR, and AR advancing learning. AI offers personalized instruction, while VR and AR create immersive simulations for interactive, hands-on experiences.
- As digital education evolves, addressing ethical concerns like data privacy and responsible tech use is crucial. Educators and policymakers must collaborate to establish guidelines ensuring ethical integration of digital education.
- Microlearning and mobile learning have become increasingly popular trends in the eLearning space.
- Microlearning divides content into bite-sized segments, while mobile learning allows access via smartphones or tablets. As attention spans shrink and mobility increases, these trends are likely to grow.
- Gamification and game-based learning utilise game design principles to enhance the interactivity and engagement of the learning process. Incorporating features such as points, badges, and leaderboards incentivises learners to successfully complete courses and reach their learning objectives.

Self-learning capability of Digital Systems

- Future tutoring systems might adapt to student mistakes like AlphaGo, which defeated top human players in Go. While computers may match human learning styles better than teachers, it's also possible no efficient algorithm will exist for this.

Challenge of making Digital Education offline or on low internet speed

Making digital education accessible offline or in low internet speed environments can be a challenging task. However, there are some strategies and technologies that can help overcome these challenges. Here are a few approaches

- **Offline Content Delivery:** Provide downloadable content such as PDFs, e-books, videos, or interactive modules that can be accessed without an internet connection. Users can download the content when they have access to the internet and consume it offline at their convenience.
- **Mobile Apps:** Develop mobile applications that can store educational content locally on the device. Users can download the app and access the content without relying on a stable internet connection. Apps can also synchronise data and updates whenever an internet connection is available.
- **Learning Management Systems (LMS):** Use learning management systems with offline functionality for accessing materials, assignments, and quizzes. Data syncs with the LMS once online.
- **USB/CD Distribution:** Distribute educational content through USB drives or CDs. Users can access the content directly from these physical media without requiring an internet connection. This approach is particularly useful in areas with limited or no internet access.
- **Curriculum on Storage Devices:** Store educational content on portable storage devices like SD cards or external hard drives. These devices can be distributed to students, who can access the content on their personal computers or devices offline.
- **Interactive Offline Activities:** Design interactive offline activities, worksheets, or projects that do not require internet connectivity. These activities can engage students and promote learning even in low-tech environments.

It is essential to consider the target audience, infrastructure limitations, and available technology when designing offline or low-internet education solutions.

Open Standards for Digital Education

India has indeed made significant progress in promoting open standards for digital education. The country has recognised the importance of interoperability, accessibility, and affordability in ensuring widespread access to educational resources. Here are a few examples of India's pioneering work in open standards for digital education:

- **National Repository of Open Educational Resources (NROER):** The NROER, by India's Ministry of Education, is a centralized repository of open educational resources, offering a platform for sharing and accessing digital materials like textbooks, videos, and interactive modules.
- **National Digital Library of India (NDLI):** The NDLI is a digital library that offers free access to a vast collection of academic resources, including textbooks, scholarly articles, theses, and other educational materials. It follows open standards and provides multiple formats for content, making it accessible across devices and platforms.
- **SWAYAM (Study Webs of Active Learning for Young Aspiring Minds):** SWAYAM is an online platform offering MOOCs and digital resources from various Indian institutions. It ensures compatibility with different devices and learning systems through open standards.
- **DIKSHA** is a groundbreaking digital platform developed by the National Council of Educational Research and Training (NCERT) in India. It serves as a comprehensive hub of educational resources, providing teachers, students, and parents with access to a wide range of digital learning materials.
- **NDEAR- National Digital Education Architecture** has been envisioned as UPI for Education.

It aims to create a unified digital ecosystem that supports the diverse needs of the education sector by leveraging technology. Key features of NDEAR are:

- **Unified Digital Infrastructure:** NDEAR aims to provide scalable, interoperable digital infrastructure for teaching, learning, administration, and governance, ensuring seamless access to diverse educational resources and services nationwide.
- **Interoperability and Standards:** The architecture emphasises the importance of interoperability, enabling different digital platforms and services to work together effectively. It sets standards and guidelines to ensure consistency and compatibility across various educational technologies and systems.
- **Data-Driven Decision Making:** NDEAR facilitates the collection, analysis, and utilisation of educational data to inform decision-making at all levels, from individual schools to national policy. It promotes the use of data analytics and artificial intelligence to enhance educational planning, delivery, and outcomes.
- **Personalised Learning:** The architecture supports the development of personalised learning experiences tailored to individual student needs and preferences. It enables adaptive learning technologies that can provide customised content and feedback to students.
- **Inclusivity and Accessibility:** NDEAR aims to bridge the digital divide by ensuring that all students, regardless of their socio-economic background, have access to digital educational resources.

Thus, it represents a transformative approach to integrating technology into the Indian education system. By creating a unified digital ecosystem, it aims to enhance the quality, accessibility, and equity of education across the country.

NDEAR provides the following:

- **Specifications & Standards:** A set of nationally interoperable standards and specifications allowing Interoperability and portability across all systems.
- **Microservices & APIs:** A set of unbundled services deployed in a federated manner and available via APIs, which can be used by the ecosystem to build and innovate solutions to address the diversity and scale.
- **Reference Solutions:** A set of reference solutions and apps that can be deployed in a federated manner and used freely out of the box.

To cater to 5 key personas (Student, Parent, Teacher, Administrator, Community members) and 3 key ecosystems (Programs, asset, solution) across 2 core interactions (learning and administration).

From Classrooms to Screens

The future of education is increasingly shifting from traditional classrooms to digital screens, driven by advancements in technology and changing learning needs. Here are some key aspects of this transition:

- **Online and Blended Learning:** Online learning platforms and technology integration have enabled remote and blended learning models, allowing students to access content, participate in activities, and engage in virtual discussions from anywhere, offering flexible, customizable learning experiences.
- **Personalised Learning Experiences:** Digital platforms offer opportunities for personalised learning tailored to individual student needs and preferences. Adaptive learning technologies can analyse student

performance data and provide targeted recommendations, adaptive assessments, and customised learning pathways.

- **Virtual Reality (VR) and Augmented Reality (AR):** VR and AR are transforming education by allowing students to explore virtual environments, conduct experiments, and engage in immersive simulations, offering interactive, experiential learning beyond traditional methods.
- **Collaboration and Global Connections:** Digital screens allow students to connect globally through video conferencing, forums, and collaboration tools, enabling cross-cultural exchanges, project-based learning, and collaborative problem-solving.
- **Data-Driven Insights:** Digital platforms capture data on student performance and engagement, allowing educators to gain insights, identify improvement areas, and make informed decisions, optimizing learning experiences through data-driven analytics.
- **Lifelong Learning and Microlearning:** In the digital age, screens offer endless learning opportunities through online courses and resources. Microlearning provides concise, focused modules, fitting education efficiently into busy schedules and fostering continuous personal growth.

As we continue this transformation, it is crucial to fully embrace the opportunities that technology offers while also preserving the human touch of educators. By doing so, we can foster creativity, critical thinking, and support the growth of every learner.

E-LEARNING BARRIERS IN RURAL INDIA AND WAY FORWARD

E-learning's transformative impact on rural populations has garnered global attention, including from the UN, which launched online courses during the Covid-19 pandemic. These courses cover topics like sustainable development, human rights, and climate change, aiming to equip people with essential knowledge through accessible digital education.

- India is well-positioned to benefit from the digital education revolution, especially due to challenges in traditional education for rural areas. Prime Minister Modi emphasized e-learning's role in broadening teaching resources and bridging gaps between village and city schools.
- E-learning can democratize access to quality education, but its implementation in rural areas faces challenges like infrastructure, socio-economic disparities, and technological barriers, which need addressing to achieve its full potential.
- The digital divide impacts rural development, creating unequal access to quality education. E-learning platforms can address geographical and technological barriers by delivering materials to remote areas. With 65% of India's population in rural areas facing resource shortages and a lack of qualified teachers, these platforms offer a solution to educational challenges.

Infrastructural Challenges

- Infrastructural inadequacies in rural India have the potential to adversely impact the transformative power that e-learning contains. A robust digital infrastructure is the backbone of effective e-learning, yet rural areas struggle with a significant scarcity of essential components.
- Inadequate internet connectivity in rural areas disrupts e-learning, hindering students' access to online resources and real-time interaction, creating a significant educational disparity.
- Unreliable electricity exacerbates internet connectivity issues with frequent outages and voltage fluctuations, rendering devices unusable. Rural areas also face a shortage of digital devices and underdeveloped infrastructure, including digital classrooms and Wi-Fi hotspots, hindering e-learning effectiveness.

Technological Barriers

Technological challenges in rural India, combined with infrastructure issues and economic constraints, hinder e-learning success, widening the technology gap between rural and urban areas.

- In rural India, about 86% of people have internet access, but most use smart phones that are not suitable for e-learning for a long time. Also, laptops and computers cost a lot, so it is hard for students to get the tools they need for e-learning.

- India's 22 recognized languages highlight its cultural richness, but unequal technology support and limited digital materials in local languages, mostly in English, create barriers for students learning in their native languages.
- Rural families often use low-power smartphones, and expensive laptops hinder access to quality e-learning. Limited digital content and language barriers further challenge students, including those with disabilities, in accessing relevant study materials.
- For e-learning to work, teachers need to know how to teach well with technology. But many rural teachers do not have enough training and help to use technology in their teaching. This makes it hard to create useful online lessons.
- Increased use of digital tools in rural areas heightens the risk of cyber-attacks. To address this, India must invest in better systems, train teachers, and develop localized digital materials.

Socio-Economic Factors

- India's cultural diversity and economic disparities impact e-learning, with rural areas facing barriers such as inadequate digital skills among students, parents, and teachers. Financial constraints further hinder access, as families struggle with the costs of devices, internet, and educational materials.
- Parental involvement can significantly impact e-learning success. In rural India, parents may prefer traditional schools and lack awareness of e-learning benefits. Social barriers also limit educational opportunities for girls, exacerbating gender disparities in education.

Implementation Challenges

- Implementing e-learning in rural schools is challenging due to poor internet, insufficient computers, and unreliable electricity. Rural teachers also need more training to effectively use technology, widening the gap between rural and urban schools.
- The stuff students learn and the online materials available might not fit what rural students need. This can make it hard for students to get interested and learn well.
- Some people in rural areas do not like using technology for learning. Helping them learn and getting families involved are important.
- Evaluating e-learning effectiveness in rural schools is challenging, as traditional assessment methods may not reflect online learning success. Ensuring its sustainability requires funding, maintenance, and expanded use, with quality control remaining a key issue.
- Addressing these issues requires government, schools, tech companies, and community involvement. Investing in better internet, teacher training, quality online lessons, and family engagement can improve e-learning in rural India.

Towards better outcomes

Achieving effective e-learning in India requires a nationwide strategy, significant investment in technology, infrastructure, teacher training, and digital content, with collaboration among governments, the private sector, and NGOs. Some effective strategies to address e-learning challenges in rural India can include the following:

- **Bridging the Digital Gap:** Making sure every student can get a device and good internet is important. This could mean giving out cheaper tablets or helping families get online for less money.
- **Personalised Learning:** Using AI and data analysis to create adaptive learning platforms that fit each student's needs and learning speed. These platforms can adjust lessons and give feedback to help students learn better.
- **Empowering Students:** Giving students choices in what they learn and how fast they learn helps them get more involved. Using games and fun activities also makes learning more interesting.
- **Supporting Teachers:** Teachers should get more training in using technology to teach. They should also get help and support to make sure they can teach well online. They should also get help from other teachers who know more about tech.
- **Public-Private Partnerships (PPPs):** Working together with companies and groups outside of school can help make e-learning better. They can give money, technology, and people to help rural schools.

- **Community Learning Centres:** Making centres where students can go to learn outside of school can help. These places should have computers, good internet, and people to help students use technology.
- **Cultural Learning:** Making sure what students learn online fits their culture is important. This means making lessons in local languages and using ideas and stories from their communities.
- **Including Everyone:** Making sure students with disabilities can use online learning tools is important. This means making sure websites and apps work for everyone, no matter what.
- **Using Data to Get Better:** Keeping track of how well online learning works helps make it better. This means looking at how students do, how much they use it, and if teachers like using it.

In Karanjale, Pune, the Traceable Giving Foundation's E-Learning Classroom and Computer Training Project is transforming education with modern technology. Projectors and interactive screens replace chalkboards, enhancing engagement with 3D simulations and videos in subjects like math and science. The project also promotes art, sports, and local culture, fostering personal growth and discovery.

Teachers have evolved into digital mentors, using tablets to track progress and tailor lessons. This project not only enhances classrooms but also empowers students like Ravi and Priya, showing how technology can transform rural education.

Success stories in rural areas can be replicated by improving digital education and addressing challenges. With collaborative efforts from leaders, teachers, and tech companies, e-learning can provide quality education and opportunities for all students

E-LEARNING: ARTIFICIAL INTELLIGENCE TRANSFORMING THE LEARNING LANDSCAPE IN INDIA

India is experiencing a major e-learning transformation driven by AI, revolutionizing education with personalized learning and enhanced engagement. AI uses vast data and complements the human touch of teachers, optimizing student outcomes. AI integration in Indian education has revolutionized traditional methods, ushering in personalized learning and innovation. With one of the largest higher education networks globally, India's AI market is projected to reach \$7.8 billion by 2025.

During the pandemic, India evolved from basic online courses to comprehensive digital platforms. Dropout rates tripled, from 1.8% in 2018 to 5.3% in 2020. E-learning offered home-based models but widened inequalities, especially for marginalized communities.

The Evolution of E-Learning in India: Moving towards AI

- E-learning in India has transformed education, especially in rural areas, due to technology and internet growth, addressing gaps in traditional learning methods. During COVID-19, e-learning surged as schools closed, showcasing its effectiveness. Institutions rapidly shifted online, using tools like Zoom, Microsoft Teams, and Google Meet for teaching and real-time communication. Edtech startups are leveraging AI to offer personalized learning. AI tailors content, automates grading, and provides real-time support through chatbots and virtual tutors, transforming the education sector.

Building LLMs for better Learning

- Each student learns differently and at their own pace. A 1984 study showed tutoring and mastery teaching greatly improved learning, but developing countries like India face challenges due to limited resources. AI in EdTech, especially large language models, offers a solution.
- Large Language Models (LLMs) enhance AI interactions, improving chatbots, virtual assistants, and content creation. Their versatility benefits fields like customer service and education by processing text, generating responses, and aiding decision-making efficiently.
- Language models are highly adaptable, serving various purposes based on training data. In education, they act as personal tutors, offering individualized attention and generating personalized tests. They can help students in underserved regions by translating vast educational content into local languages, ensuring accessibility.

Champions of Change

- At a global conference, Sam Altman, Co-Founder of ChatGPT, predicted AI will become more capable and ubiquitous. He highlighted healthcare and education as key areas for innovation, with AI enhancing personalized learning.

- Traditional learning remains important, but technology enhances education. Over 2 million students use Indian e-learning platforms like Unacademy and Toppr, with numbers expected to double. Platforms are incorporating AR and VR for immersive learning.
- While many platforms focus on e-learning, startups like Miko and Questt use immersive tech to innovate. Miko is an AI-powered robot for kids, while Questt offers AI-based study planning, quizzes, and analytics.
- Startups like Embibe and Toppr use AI to enhance test preparation with personalized practice tests and performance analytics. Embibe offers detailed student analysis, while Toppr provides adaptive, customized study plans, improving learning curves.
- Startups like DoubtNut are breaking language barriers in rural areas by offering educational content in multiple Indian languages. Using AI, DoubtNut provides instant video solutions, making learning accessible to students with limited resources.
- These startups enhance education quality and bridge the digital divide by providing resources to remote areas. Integrating AI transforms e-learning in India, ensuring all students have opportunities to succeed.

AI Penetration in India

- The Indian government launched the National Program for AI to address challenges in accessibility and education. The 2020 INDIAai portal supports AI developments. The December 2023 report predicts AI will add \$967 billion to the economy by 2035.
- "Bhashini," a government-led project, uses AI and natural language processing to break language barriers, creating digital solutions in multiple Indian languages for rural inclusivity and accessibility.
- Bhashini develops AI tools for translating and interpreting regional languages, making digital content and services accessible in local dialects. This initiative benefits frontier and tribal areas by providing translation services for government schemes, education, and healthcare.
- Atal Innovation Mission (AIM) has revolutionized Indian education with over 10,000 Atal Tinkering Labs (ATLs) impacting 1.1 million students. These labs foster innovation through robotics, 3D printing, and AI. AIM, CBSE, and Intel's 2024 'India AI Impact Festival' aims to enhance AI readiness and promote innovation in schools.

Equity and quality of education

- As India aims for a \$5 trillion economy, addressing education inequities is crucial. While some public schools are well-resourced, many, especially in backward districts, struggle due to disparities in infrastructure and resources.
- A stratified education system limits access for marginalized students, hindering their participation and success. State governments should focus on initiatives like remedial teaching and bridge courses, partnering with NGOs and local bodies to improve quality.
- Technology, especially AI, can democratize education like telemedicine has for healthcare. AI models with vernacular content can provide quality learning opportunities to students in remote and underserved areas, matching city standards.

Responsible AI

- Artificial intelligence (AI) is transforming sectors like creative, legal, and educational. As businesses and learners adapt, educators are crucial in preparing the next generation to use AI responsibly. Responsible AI in education means fair, transparent systems that prioritize student welfare and data privacy. Governments must regularly intervene to ensure ethical standards, guiding educators and policymakers in India to monitor and develop effective AI policies.

Conclusion

- Artificial Intelligence or AI is transforming e-learning in India, making education more personalised, interactive, and accessible. Increased opportunities for generating ideas and receiving instant feedback, which can support and empower students to analyse topics they are passionate about, is increasing their interest in global platforms like ChatGPT, Gemini and other.

- AI enhances assistive technologies, providing adaptive solutions like speech recognition and text-to-speech for students facing various challenges. It also promotes global collaboration by overcoming language and geographic barriers.
- AI, driven by initiatives like the India AI Mission and global tech investments, is bridging educational gaps and democratizing quality education. Despite challenges, AI's future in e-learning promises innovation and empowerment.

E-GRAMSWARAJ: SIMPLIFIED WORK BASED ACCOUNTING APPLICATION FOR PANCHAYATI RAJ

Features

- eGramSwaraj is one of the applications developed as part of Panchayat Enterprise Suite (PES) under e-panchayat Mission Mode Project (MMP3) of Ministry of Panchayati Raj (MoPR).
- eGramSwaraj aims to bring in better transparency and strengthening the e-Governance in Panchayati Raj Institutions (PRIs) across the country through decentralised planning, progress reporting and work-based accounting.
- eGramSwaraj will assist in enhancing the credibility of Panchayats which would induce greater devolution of funds to PRIs. Furthermore, eGramSwaraj provides a platform for effective monitoring by higher authorities.

eGramSwaraj Architecture

eGramSwaraj is designed with the following three key target user groups in consideration:

- **Local Bodies:** Rural and Urban local bodies are key users of this app, managing crucial tasks like GPDP formulation, work monitoring, vendor and employee management, and financial oversight.
- **Line Departments:** GPDP involves 29 subjects and 18 Ministries, with Line Departments driving social welfare programs. Data-driven planning and monitoring are essential for effective, last-mile service delivery.
- **Citizens:** Gram Panchayats are managed by elected and appointed representatives, but citizens must stay informed and vigilant about regional progress. With accessible data, the public contributes significantly to inclusive decision-making.

Considering the above high-level user personas, the following six modules form the backbone of eGramSwaraj application:

- **Panchayat Profile:** This module includes the Gram Panchayat's general profile, details of elected members, committee members, and employees, aiding citizens and visitors in contacting representatives and staff.
- **Planning:** In Gram Sabha meetings, proposed works are entered into eGramSwaraj by PRIs. District Administration grants administrative sanction only for works listed with budget allocation in eGramSwaraj.

The Ministry's Gram Manchitra application supports spatial planning by integrating people's needs with facility management. It uses geographic data, drone images, and high-resolution maps for sustainable planning, ensuring effective decision-making and resource use at the panchayat level.

- **Progress Reporting:** This module reports physical and financial progress of Action Plan activities using various funds. It reflects progress in Technical and Administrative approvals, tracking work costs and agency details.
- **Accounting:** To ensure control and accountability, the Model Accounting System (MAS) for Panchayats allows users to manage budgets, financial data, schemes, vendors, and transactions, with voucher-based, digitally verified transactions and reconciliation.
- **Asset Directory:** This module updates asset status, capturing details like new status (e.g., abandoned, active), reason, and update date, ensuring accurate and current asset information.
- **User Management:** This module enables the system administrators at various levels in management of user accounts and their extent of access to various modules and functionalities of the system, along with user credential management for privileged access.

eGramSwaraj digitizes the entire Gram Panchayat works planning and monitoring lifecycle. It covers development plan creation, geo-tagged progress tracking, financial monitoring, and PFMS-linked fund disbursement, serving all stakeholders comprehensively.

HIGHLIGHTS OF THE UNION BUDGET 2024-25

The Union Minister of Finance and Corporate Affairs Smt. Nirmala Sitharaman presented the Union Budget 2024-25 in Parliament on July 23, 2024. The highlights of the budget follow:

Budget Estimates 2024-25

- Total receipts other than borrowings: Rs 32.07 lakh crore.
- Total expenditure: Rs 48.21 lakh crore.
- Net tax receipt: Rs 25.83 lakh crore.
- Fiscal deficit: 4.9 per cent of GDP.
- Government aims to reach a deficit below 4.5 per cent next year.
- Inflation continues to be low, stable, and moving towards the 4% target; Core inflation (non-food, non-fuel) at 3.1%.

Focus of the Budget

- The focus of budget is on EMPLOYMENT, SKILLING, MSMEs, and the MIDDLE CLASS.

Package of PM's five schemes for Employment and Skilling

- Prime Minister's Package of 5 Schemes and Initiatives for employment, skilling, and other opportunities for 4.1 crore youth over a 5-year period.
 1. Scheme A-First Timers: One-month salary of up to Rs 15,000 to be provided in 3 installments to first-time employees, as registered in the EPFO.
 2. Scheme B-Job Creation in manufacturing: Incentive to be provided at specified scale directly, both employee and employer, with respect to their EPFO contribution in the first 4 years of employment.
 3. Scheme C-Support to employers: Government to reimburse up to Rs 3,000 per month for 2 years towards EPFO contribution of employers, for each additional employee.
 4. New centrally sponsored scheme for Skilling
- 20 lakh youth to be skilled over a 5-year period.
- 1,000 Industrial Training Institutes to be upgraded in hub and spoke arrangements.
 5. New Scheme for Internship in 500 Top Companies to 1 crore youth in 5 years

Budget Priorities in pursuit of 'Viksit Bharat'

Priority 1: Productivity and resilience in Agriculture

- Allocation of Rs 1.52 lakh crore for agriculture and allied sector.
- New 109 high-yielding and climate-resilient varieties of 32 field and horticulture crops to be released for cultivation by farmers.
- 1 crore farmers across the country to be initiated into natural farming, with certification and branding in next 2 years.
- 10,000 need-based bio-input resource centres to be established for natural farming.
- Digital Public Infrastructure (DPI) for Agriculture to be implemented for coverage of farmers and their lands in 3 years.

Priority 2: Employment & Skilling

- As part of the Prime Minister's package, 3 schemes for 'Employment Linked Incentive' to be implemented Scheme A - First Timers; Scheme B - Job Creation in manufacturing; Scheme C - Support to employers.
- To facilitate higher participation of women in the workforce,
- working women hostels and crèches to be established with industrial collaboration
- women-specific skilling programmes to be organised
- market access for women SHG enterprises to be promoted

Skill Development

- New centrally sponsored scheme for Skilling under Prime Minister's Package for 20 lakh youth over a 5-year period.
- Model Skill Loan Scheme to be revised to facilitate loans up to Rs 7.5 lakh.

- Financial support for loans up to Rs 10 lakh for higher education in domestic institutions to be provided to youth who have not been eligible for any benefit under government schemes and policies.

Priority 3: Inclusive Human Resource Development and Social Justice

Women-led development

- Total allocation of more than Rs 3 lakh crore for schemes benefitting women and girls.

Pradhan Mantri Janjatiya Unnat Gram Abhiyan

- Socio-economic development of tribal families in tribal- majority villages and aspirational districts, covering 63,000 villages benefitting 5 crore tribal people.

Bank branches in North-Eastern Region

- 100 branches of India Post Payment Bank to be set up in the North East region.

Priority 4: Manufacturing & Services

Credit Guarantee Scheme for MSMEs in the Manufacturing Sector

- A credit guarantee scheme without collateral or third- party guarantee in term loans to MSMEs for purchase of machinery and equipment.

Credit Support to MSMEs during Stress Period

- New mechanism to facilitate continuation of bank credit to MSMEs during their stress period.

Mudra Loans

- The limit of Mudra loans under 'Tarun' category to be enhanced to Rs 20 lakh from Rs 10 lakh for those who have successfully repaid previous loans.

MSME Units for Food Irradiation, Quality & Safety Testing

- Financial support to set up 50 multi-product food irradiation units in the MSME sector.

E-Commerce Export Hubs

- E-Commerce Export Hubs to be set up under public-private-partnership (PPP) mode for MSMEs and traditional artisans to sell their products in international markets.

Digital Public Infrastructure (DPI) Applications

- Development of DPI applications in the areas of credit, e-commerce, education, health, law and justice, logistics, MSME, services delivery, and urban governance.

Priority 5: Infrastructure

Infrastructure investment by Central Government

- Rs 11,11,111 crore (3.4% of GDP) to be provided for capital expenditure.

Infrastructure investment by state governments

- Provision of Rs 1.5 lakh crore for long-term interest free loans to support states in infrastructure investment.

Pradhan Mantri Gram Sada Yojana (PMGSY)

- Launch of phase IV of PMGSY to provide all-weather connectivity to 25,000 rural habitations.

Irrigation and Flood Mitigation

- Financial support of Rs 11,500 crore to projects such as the Kosi-Mechi intra-state link and other schemes in Bihar.
- Government to provide assistance to Assam, Himachal Pradesh, Uttarakhand and Sikkim for floods, landslides, and other related projects.

Tourism

- Comprehensive development of Vishnupad Temple Corridor, Mahabodhi Temple Corridor and Rajgir.
- Assistance for development of temples, monuments, craftsmanship, wildlife sanctuaries, natural landscapes, and pristine beaches of Odisha.

Priority 6: Innovation, Research & Development

- Anusandhan National Research Fund for basic research and prototype development to be operationalised.

- Financing pool of Rs 1 lakh crore for spurring private sector-driven research & innovation at commercial scale.

Space Economy

- Venture capital fund of Rs 1,000 crore to be set up for expanding the space economy by 5 times in the next 10 years.

Priority 7: Next Generation Reforms

Rural Land Related Actions

- Unique Land Parcel Identification Number (ULPIN) or Bhu-Aadhaar for all lands
- Digitisation of cadastral maps
- Survey of map sub-divisions as per current ownership
- Establishment of land registry
- Linking to the farmers registry.

SKILLING FOR THE FUTURE WITH E-LEARNING

In today's automation age, skilling is a national priority for India, highlighted in the Centre's 'Saptarishi' fiscal strategy. Since 2014, the Ministry of Skill Development and Entrepreneurship has received consistent support. Initiatives include training programs for teachers, digital literacy, and skill development, especially in rural areas, under the Digital India and National Skill Development Missions.

Key Skill Development Programmes

- Launched in 2015, the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) aims to enhance youth employability through short-term training and recognition of prior learning. Over 1.40 crore candidates have been trained, with 42% placed in various sectors nationwide.
- The Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) targets bridging the digital divide in rural India, covering 6 crore households, especially marginalized groups. Initiatives like NDLM and Skill India enhance the workforce with AI training and entrepreneurship promotion. Programs like SWAYAM, NDL, and Udyam Disha provide quality education and mentoring online.

Skill Development Through Digital Learning

- In 2023, India launched the Skill India Digital Hub (SIDH), a digital platform transforming skills, education, employment, and entrepreneurship by offering industry-relevant courses, job opportunities, and entrepreneurship support for millions of Indians.
- SIDH is India's Digital Public Infrastructure for skilling, education, employment, and entrepreneurship. Aiming to make skill development more innovative, accessible, and personalized, it focuses on digital technology and Industry 4.0 skills. The open-source platform supports lifelong learning, customization, and personalization via AI. It integrates Udyam, e-Shram, NCS, and ASEEM portals, connecting employees, employers, and educational institutes.

India's Imperative Role in Global Skills Transformation

- With its young workforce and digital infrastructure, India exemplifies scalable, sustainable skill enhancement through SIDH. Addressing fragmented training access, industry mismatch, and migration issues, SIDH offers digitally verifiable user pools, insights for policymakers, and industry-ready courses, overcoming language barriers and improving access to skill centers and job opportunities.
- SIDH integrates all Union and State government training programs, offering a comprehensive view for effective implementation. As a one-stop platform, users access courses, schemes, apprenticeships, and job opportunities without registration. Advanced personalization and a machine learning recommendation engine dynamically showcase relevant opportunities, simplifying searches and enhancing efficiency by revealing market demand trends.
- SIDH's Learning Management System (LMS) streamlines course management, delivery, and tracking with features like content management, learner registration, content delivery, progress tracking, assessment, feedback, and certification. Virtual instructor-led training (VILT) combines technology with pedagogy, offering interactive modules, efficient administration, structured scheduling, and overcoming geographic limitations, revolutionizing education.

- SIDH's Digital Job Exchange connects job seekers with tailored opportunities using AI and machine learning. It personalizes job and course recommendations, allowing users to rate and review listings, which improves decision-making and career development.
- The SIDH Map integrates geotagging and advanced mapping for easy navigation of skill centers, jobs, and institutions. Features include skill centre discovery, educational mapping, location services, and GIS for policy and infrastructure monitoring.
- SIDH dashboards offer insights into skill programs, apprenticeships, and market trends with interactive visualizations. Users can track progress, optimize strategies, and monitor training infrastructure in real-time through a centralized Control and Command center.

SWAYAM Plus

- Launched in 2017, SWAYAM is a MOOC platform offering educational opportunities. In February 2024, SWAYAM Plus was introduced with partners like L&T, Microsoft, and CISCO, aligning with NEP 2020 to enhance employability through industry-relevant courses.
- Run by IIT Madras, SWAYAM Plus is an extension of the popular SWAYAM MOOC platform, which grew from 31 lakh to over 72 lakh enrollees by 2023. It enhances employability for students and lifelong learners.
- SWAYAM Plus provides job-centric, hands-on courses focused on employability and entrepreneurship. Aligned with NEP 2020, it offers flexible learning with multiple entry and exit points, benefiting working professionals by balancing work and studies.
- SWAYAM Plus features multilingual content and an AI-enabled chatbot for personalized course selection. It ensures credit recognition and equivalency for industry courses, allowing students to earn credits towards their degrees with academic flexibility.

SWAYAM-NPTEL

- In January-April 2024, Swayam-NPTEL celebrated its 20th year and 10th year of certification. India's largest online learning platform offers 720 affordable courses in various fields to over 30 lakh learners. It has supported 2.5 crore enrollments, with 66,000 faculty members participating in 2023. NPTEL also facilitated 321 internships and fee waivers for 1.52 lakh disadvantaged learners.
- NPTEL+ is a new portal that offers a flexible format that includes self-paced courses and short-term programmes delivered in the online mode. It is designed to complement the NPTEL courses that follow the academic semester and curriculum and contain 30-40 hours of content to study from for each course.

The Rise of Lifelong Learning

- Online learning surged in popularity due to the COVID-19 pandemic, high-speed internet, and digitization. Government initiatives have further expanded the potential of educational platforms and universities.
- Advancements and the pandemic have greatly improved online degree quality. Prestigious Western universities now offer fully online programs matching their on-campus counterparts, helping students pursue new careers and ambitions.
- In India, companies value online education as universities offer blended programs with 20-40% online credits, enhancing flexibility and access while boosting online degrees' credibility for career advancement.
- Today, students and employees can choose from various career-advancing options, including upskilling courses, diplomas, certificates, and online degrees. The Indian online education market, growing at a 19.9% CAGR (2022-2027), reflects this demand for lifelong learning and skill development.
- Technology has enabled hybrid learning, blending traditional classrooms with digital flexibility. Online platforms, VR, and AR overcome geographical barriers, while AI personalizes experiences with real-time feedback and adaptable methods.

E-Learning, A Way to Bridge India's Skill Gap

- The World Economic Forum reports that only 25% of management professionals, 20% of engineers, and 10% of graduates in India are employable. The 2023 ILO report reveals 47% of workers are underqualified, with 62% of females in the same situation. Additionally, formal vocational training reaches just 2% of the workforce, and non-formal training impacts only 9%.

- Emerging technologies like Big Data and AI have widened the skills gap in India, creating more job openings than qualified candidates. Rapid digital transformation and evolving tech make it challenging for many to keep up, risking missed opportunities despite India's growing economy and young workforce.
- Online learning can help the country leapfrog this gap, overcoming challenges like the lack of access, quality, and relevance in Indian higher education, while also integrating educational content and credentials from industry educators such as Google, Amazon, and Microsoft.
- Digital learning is essential due to high skill demands and limited college seats. Of 4.1 crore students, only a few lakhs attend top institutions like IITs. With over 10 lakh aspiring engineers and just 17,740 seats, many lack access to quality education, affecting employability and career outcomes.
- India must leverage its demographic advantage, with 54% of its population under 25 and 62% of working age. By 2050, 183 million more people will join this group. Urgent skilling and re-skilling are needed. An Accenture report warns of a \$1.97 trillion loss in GDP if skills do not match technological progress by 2028. India, with the highest skills gap after Brazil, has only 2.3% of its workforce with formal vocational skills. E-learning is crucial in bridging this gap and supports most government skill development initiatives.

Why is E-Learning a Game Changer?

- Online learning offers a user-friendly interface, engaging content, and personalized pathways without the need for physical campus expansion or extensive entrance exams. IIT Madras' online BS Degree in Data Science, with over 27,000 students, surpasses campus enrollments. It has led to 2,500 job placements and admissions to prestigious universities, including Cornell and Georgia Tech.
- IIT Madras' online BS in Data Science and BITS Pilani's BSc in Computer Science bypass traditional entrance exams. With many students from smaller cities, innovative admissions for online degrees like IIT Guwahati's new BSc in Data Science & AI attract diverse academic backgrounds.

Narrowing Gender Gap

- E-learning reforms are crucial for women, bridging the gender gap in education and skills. By enhancing gender inclusion in STEM and offering flexible, affordable learning, it connects women to digital economy jobs. Women's enrollment in online STEM programs increased by 12% from 2022-23 to 2023-24, driven by learning flexibility, degree parity, and greater digital literacy, particularly in smaller cities, according to College Vidya.

The Age of Upskilling and Reskilling

- The 11th India Skills Report highlights a surge in upskilling due to AI-driven job displacement. The World Economic Forum predicts 23% of global jobs will transform in the next five years due to AI and related technologies.
- Government initiatives like Skill India and Digital India boost digital literacy and upskilling, while private platforms offer AI courses. McKinsey estimates 800,000 manufacturing jobs may be lost to automation by 2030.
- According to the Microsoft and LinkedIn 2024 Work Trend Index, 92% of India's knowledge workers use AI at work, higher than the global 75%. 91% of leaders think adopting AI is crucial, though 54% worry about a lack of implementation plans.
- To navigate disruption, collaboration between government, industry, and education is vital for effective upskilling. Embracing soft skills and lifelong learning is essential for adapting to the evolving job market.

Focus on Creating Quality Content

- The rise in e-learning drives online content creation, addressing education quality gaps. The UGC's National Credit Framework allows up to 40% credits from online courses, benefiting institutions using platforms like SWAYAM and Coursera. Generative AI aids in creating customized courses, blending global and local content.
- New UGC and NCVET guidelines strengthen university-industry connections, allowing credits for industry micro-credentials like Professional Certificates. These online certifications, from companies like Google and IBM, boost students' employability for digital jobs and can impact institutional enrollment.

Skills Empower Businesses and Societies

- In July 2024, CII and Nasscom partnered to reskill and upskill 100,000 youth in non-IT sectors over two years. The initiative targets seven sectors, including BFSI and healthcare, offering both free and paid

digital skills programs. It aims to foster a digital learning culture and enhance relevance in the evolving tech landscape. CII's 12th Centre of Excellence will impact 10 million youth in five years.

- UNICEF's Passport to Earning (P2E) has skilled and certified over one million young people in India in financial literacy and digital productivity. Notably, 62% were girls. Aligned with NEP 2020, P2E offers free courses and aims to reach 5 million youth by 2024, supporting job and entrepreneurship opportunities.
- Digital learning is revolutionizing skill development in India, providing accessibility and flexibility. It equips the workforce for the digital age, unlocking economic potential and creating empowered professionals for a dynamic job market.

BRIDGING THE GAP: E-LEARNING AS A CATALYST FOR HEALTH AND NUTRITION AWARENESS

Awareness of health and nutrition is rising in India, especially in rural areas. E-learning technologies offer a promising solution to overcome dissemination challenges. E-learning can overcome geographical barriers, enhancing health and nutrition awareness in rural communities. It offers scalable, interactive platforms like online courses, mobile apps, and webinars to educate and empower residents.

The Indian government promotes e-learning and health awareness in rural areas through schemes using technology to ensure equitable access to information and services.

1. Digital India Initiative: Launched in 2015, Digital India aims to transform India into a digitally empowered society, promoting digital literacy, high-speed internet, and e-learning. CSCs provide rural access to health information.

- **e-Sanjeevani:** Telemedicine connects rural patients with urban doctors via video consultations, improving healthcare access, providing timely advice, and bridging the gap through digital platforms.
- **Digi Locker:** An online platform securely stores and shares documents like health records and certificates, ensuring easy access to personal information and enhancing continuity of care.
- **Pradhan Mantri Gramin Digital Saksharta Abhiyaan (PMGDISHA):** Launched in 2017, this program aims to make one person per rural household digitally literate, including health and nutrition awareness modules.
- **National Digital Literacy Mission (NDLM):** Focuses on providing digital literacy to citizens, including health-related e-learning content.
- **e-Health:** It was introduced to provide timely and effective healthcare services such as online registrations, payments, reports, and claims.
- **E-education:** It was started to provide online education in remote and urban areas using technologies such as smartphones, apps, and internet services.
- **eRaktKosh:** It is a centralised blood bank management system inaugurated on April 7, 2016, for automation of blood banks and has a web-based application with Aadhaar linkage facility.
- **Services e-Health Assistance Teleconsultation (SeHAT)** SeHAT, launched on May 27, 2021, is the Ministry of Defense's tri-services teleconsultation service for entitled personnel and families, supporting Digital India and e-governance initiatives

2. National Digital Health Mission (NDHM): Launched in 2020, NDHM aims to create a digital health ecosystem with unique health IDs, electronic records, and a health information exchange, benefiting rural healthcare access and outcomes.

3. Saksham Anganwadi and Poshan 2.0: The Ministry of Women and Child Development implemented Saksham Anganwadi and Poshan 2.0 (2021-26). Revised guidelines (June 24, 2024) emphasize ICT strengthening, providing smartphones and data support to supervisors and coordinators.

To address gaps and improve the ongoing nutrition program, Poshan 2.0 reorganizes existing components into primary verticals for better implementation and enhanced nutrition and child development outcomes:

- Nutrition Support for POSHAN through Supplementary Nutrition Programme (SNP) for children of the age group of 6 months to 6 years, pregnant women and lactating mothers; and for Adolescent Girls in the age group of 14 to 18 years in Aspirational Districts and North Eastern Region (NER)
- Early Childhood Care and Education (3-6 years) and early stimulation for (0-3 years)
- Anganwadi Infrastructure including modern, upgraded Saksham Anganwadi
- **Poshan Abhiyaan:** Launched in 2018, Poshan Abhiyaan targets reducing stunting, undernutrition, low birth weight, and anemia through technology and e-learning to spread nutritional awareness. The

mission leverages mobile applications, e-learning platforms, and social media to disseminate information about nutrition and healthy practices.

- **ICT-RTM (Information and Communication Technology-Real Time Monitoring)** uses mobile applications to monitor and evaluate the nutrition status of beneficiaries. It also provides educational content on nutrition and health practices.
- **Poshan Maah (Nutrition Month) and Poshan Pakhwada** utilises e-learning tools to conduct workshops, webinars, and digital campaigns focused on nutrition awareness about the importance of nutrition and promote healthy eating habits through Jan Andolan and Jan Bhagidari.

'**Poshan Tracker**', a robust ICT enabled platform to improve governance with regard to real time monitoring of provisioning of supplementary nutrition for prompt supervision and management of services.

4. Ayushman Bharat Digital Mission: The Ayushman Bharat Digital Mission (ABDM) aims to develop the backbone necessary to support the Integrated digital health infrastructure of the country. It will bridge the existing gap amongst different stakeholders of healthcare ecosystem through digital highways. ABDM has the following components:

- **The Healthcare Professionals Registry (HPR)** is a comprehensive database of healthcare professionals in modern and traditional medicine. Enrolling connects them to India's digital health ecosystem.
- **ABHA Mobile App (PHR):** A PHR is an electronic health record conforming to national standards, drawn from multiple sources, and managed, shared, and controlled by the individual.
- **Health Facility Registry (HFR):** The Health Facility Registry is a comprehensive database of national health facilities, including public and private hospitals, clinics, labs, imaging centers, and pharmacies, connecting them to India's digital health ecosystem.
- **Unified Health Interface (UHI):** The UHI Network connects End User Applications and Health Service Provider apps via an open protocol, enabling digital health services like appointment booking, teleconsultation, and service discovery.
- **ABHA Number:** Standardizing identification in healthcare ensures correct medical record access with consent. A Unique Health ID (UHID) requires demographic, location, and contact details. The Ayushman Bharat Health Account (ABHA) Number uniquely identifies and links health records across systems.
- **Aarogya Setu** has evolved into a National Health App under ABDM. Users can register for a Digital Health ID, interact with healthcare providers, and seamlessly receive digital lab reports, prescriptions, and diagnoses from verified professionals.
- **The e-Hospital application** This cloud-based Hospital Management Information System connects patients, hospitals, and doctors on a digital platform via SaaS. It serves government and cooperative hospitals and includes e-learning modules for health professionals and citizens.

5. Swasth Bharat Prerak Programme: Launched in January 2018, the Swasth Bharat Prerak (SBP) program, by the Ministry of Women & Child Development and Tata Trusts, supports POSHAN Abhiyaan by enhancing district and state implementation with technology-driven solutions and e-learning for rural health workers.

Swasth Bharat Yatra: A nationwide campaign that includes digital workshops, webinars, and e-learning modules on health and nutrition awareness.

6. e-School for Farmers: Implemented by the Ministry of Agriculture and Farmers Welfare, this program offers online courses, video tutorials, and expert advice on agriculture, health, and nutrition to enhance farmers' knowledge and livelihoods.

7. National Health Mission (NHM): Launched in 2013, aims to provide accessible, affordable, and quality healthcare to rural populations. It includes a significant focus on maternal and child health, nutrition, and disease prevention. The NHM incorporates e-learning strategies to educate healthcare providers and the community about health practices and nutrition.

- **ASHA Training Modules:** E-learning modules designed for Accredited Social Health Activists (ASHAs) to enhance their knowledge about health and nutrition.
- **Janani Shishu Suraksha Karyakram (JSSK):** Uses digital platforms to educate mothers about prenatal and postnatal care, nutrition, and infant health.

8. School Health Programme under Ayushman Bharat: This program enhances school children's health through regular check-ups, education, and nutrition. E-learning trains teachers and health workers to provide accurate health information.

- **Health and Wellness Ambassadors:** Teachers trained as Health and Wellness Ambassadors use e-learning modules to educate students about health and nutrition.
 - **Fit India School Week:** Incorporates e-learning activities and webinars to promote physical fitness and nutritional awareness among students.
- 9. Rashtriya Bal Swasthya Karyakram (RBSK):** This child health program improves overall health with regular check-ups and nutritional support, using e-learning to train health workers and educate parents about child health.
- **Mobile Health Teams:** These teams use e-learning tools to disseminate health and nutrition information to parents and caregivers during health camps.
 - **Child Health Screening App:** An app that provides e-learning content on child health and nutrition to healthcare workers and parents.
- 10. PM e-VIDYA:** A comprehensive initiative called PM e-VIDYA was initiated as part of Atma Nirbhar Bharat Abhiyan on May 17, 2020, which unifies all efforts related to digital/online/on-air education to enable multi-mode access to education. The initiative includes:
- **DIKSHA (one nation, one digital platform)** provides quality e-content and QR-coded textbooks for school education across 35 states/UTs, with localized content available on the platform.
 - One earmarked Swayam Prabha TV channel per class from Class 1 to 12 (one class, one channel).
 - Extensive use of Radio, Community radio and CBSE Podcast- Shiksha Vani.
 - Special e-content for visually and hearing impaired developed on **Digitally Accessible Information System (DAISY)** and in **sign language on NIOS website/ YouTube.**
 - Besides, the Ministry has undertaken a proactive initiative, named, 'MANODARPAN' covering a wide range of activities to provide psychosocial support to students, teachers and families for Mental Health and Emotional Wellbeing.
- 11. The PM Poshan Scheme (Pradhan Mantri Poshan Shakti Nirman),** provides a hot meal in government schools from 2021-22 to 2025-26, targeting children in pre-schools and classes I to VIII, improving nutrition and education. The scheme plays a significant role in addressing health and nutrition-related awareness in rural India through e-learning initiatives:
- **Integration of Nutrition Education with School Curriculum:** The PM Poshan Scheme includes digital modules in schools, educating children about balanced diets, hygiene, and essential nutrients as part of their curriculum.
 - **Interactive Content:** Utilising multimedia content such as videos, animations, and interactive quizzes, the scheme makes learning about nutrition engaging and informative for young students.
 - **Training and Capacity Building for Teachers and Staff:** Teachers and school staff receive training through online platforms on how to integrate nutrition education into their teaching. These programs cover topics like food safety, nutritional requirements, and healthy eating habits.
 - **Digital Resources:** Providing access to digital resources and e-books helps educators stay updated with the latest information and teaching methodologies related to health and nutrition.
 - **Virtual Workshops and Webinars:** The scheme conducts virtual workshops and webinars for parents and community members to spread awareness about the nutritional needs of children and the benefits of the PM Poshan Scheme.
 - **Digital Campaigns:** Leveraging social media and other digital platforms, the scheme runs awareness campaigns highlighting the importance of proper nutrition and health practices in rural areas.
 - **Digital Monitoring Systems:** The scheme uses digital tools to monitor the implementation and impact of the program. This includes tracking the nutritional status of children and the effectiveness of nutrition education initiatives.
 - **Feedback Mechanisms:** E-platforms provide avenues for collecting feedback from students, teachers, and parents, which helps in continuously improving the program.
 - **Collaboration with Other Digital Initiatives:** The PM Poshan Scheme collaborates with initiatives like the Ayushman Bharat Digital Mission (ABDM) to enhance health and nutrition education through shared digital resources and platforms.
 - **Partnerships with NGOs and Private Sector:** Partnering with NGOs and private sector players to develop and disseminate high-quality digital content related to health and nutrition.

12. Mobile Health (mHealth) uses mobile technologies to provide healthcare and health information, bridging gaps in rural India by offering accessible, cost-effective solutions and e-learning opportunities.

➤ **Enhancing Accessibility and Reach:** Mobile phones have a high penetration rate in rural areas, making them ideal for delivering health information. mHealth initiatives ensure that health and nutrition information is accessible to a large audience, regardless of geographical barriers.

- **SMS Campaigns:** Sending regular SMS updates with health tips and nutritional advice.
- **Voice Messaging Services:** Using automated voice messages to reach those with low literacy levels.
- **Mobile Academy** offers a free audio course to enhance ASHAs' knowledge and communication skills via mobile phones, providing efficient, cost-effective training anytime, anywhere for thousands of users.

➤ **Providing Real-Time Information and Support:** mHealth applications can offer real-time updates and support for health and nutrition queries. Timely information helps individuals make informed decisions about their health and nutrition.

- **mDiabetes Program:** Real-time SMS alerts for diabetes management and nutritional guidance.
- **Kilkari**, an IVR-based service, sends 72 free weekly audio messages about pregnancy and childcare to families' mobile phones from the second trimester to the child's first year.

➤ **Empowering Community Health Workers:** mHealth tools equip community health workers with resources to educate and assist rural populations. It enhances the capacity of health workers to deliver accurate and consistent health education.

- **Mobile Kunji:** A mobile-based tool that helps health workers educate mothers about nutrition and child health.
- **mSakhi:** An app providing health workers with information on maternal and child health, enabling them to offer better guidance.

➤ **Facilitating Remote Consultations and Telemedicine:** Mobile platforms enable remote consultations, reducing the need for physical visits to healthcare facilities. This increases access to healthcare services and expert advice, especially in remote areas.

- **eSanjeevani:** A telemedicine service offering remote consultations via mobile devices.
- **Promoting Interactive and Engaging Learning:** Mobile applications offer interactive learning modules, quizzes, and multimedia content to engage users. This makes health and nutrition education more engaging and easier to understand.
- **Poshan Atlas:** An app providing interactive nutritional advice, recipes, and diet plans to embed positive nutrition behaviours among children, youth, etc.
- **Poshan Abhiyaan:** Uses mobile technology to provide multimedia content on nutrition and health for mothers and children.

➤ **Monitoring and Data Collection:** Mobile health tools can collect data on health metrics, which can be used for monitoring and improving health interventions. These provides valuable insights into health trends and the effectiveness of health programs.

- **mHealth4TB:** Uses mobile phones to track TB patients' adherence to treatment.
- **ANMOL (ANM Online):** An app for Auxiliary Nurse Midwives to track maternal and child health data.

Integrating e-learning into rural health programs can revolutionize public health by enhancing infrastructure, community engagement, and cultural sensitivity. Effective partnerships, monitoring, and government support are key to improving health and nutrition awareness.

Challenges of E-Learning for Health and Nutrition Awareness in Rural Communities	Proposed Strategies To Overcome The Challenges
Digital Divide	<p>Infrastructure Development: Expand broadband access through initiatives like BharatNet.</p> <p>Mobile-Focused Platforms: Develop mobile-friendly e-learning apps (e.g., Poshan Tracker app).</p>
Low Digital Literacy	Training Programs: Conduct digital literacy workshops for community health workers and beneficiaries.

	User-Friendly Interfaces: Simplify interfaces for easy navigation (e.g., using local languages).
Cultural Barriers	Cultural Sensitivity: Customize content to align with local beliefs and practices. Community Involvement: Engage local leaders and influencers in promoting e-learning initiatives.
Limited Access to Devices	Device Provisioning: Provide subsidized or loaned devices (e.g., tablets) for accessing e-learning content. Community Centres: Establish e-learning hubs in community centres with shared devices.
Content Relevance	Localised Content: Develop region-specific content that addresses local health and nutrition issues. Interactive Modules: Incorporate quizzes, games, and interactive content to enhance engagement.
Monitoring and Evaluation	Impact Assessments: Conduct regular evaluations to measure the effectiveness of e-learning initiatives (e.g., using data analytics). Feedback Mechanisms: Implement feedback loops to gather insights from users for continuous improvement.
Sustainability	Integration with Existing Programs: Embed e-learning modules into existing health and nutrition schemes (e.g., Ayushman Bharat Yojana). Public-Private Partnerships: Collaborate with private sector for sustainable funding and support.

DIGITAL EDUCATION IN 21ST CENTURY: POSITIVE OUTLOOKS AND CHALLENGES

Digital technology has transformed 21st-century education, shifting from traditional lectures to strategic, learner-centric approaches. Teachers now facilitate learning, with knowledge instantly accessible through emerging technologies, making online learning a powerful teaching tool.

India's 21st-century educational landscape has shifted from traditional methods to digital platforms, offering opportunities and challenges. The National Education Policy 2020 supports digital infrastructure, online teaching tools, virtual labs, and multilingualism, integrating cultural aspects through creative approaches like gamification, storytelling, and music. India's AI market is projected to reach \$7.8 billion by 2025 with a 20.2% annual growth rate. The National Education Policy (NEP) 2020 emphasizes integrating AI into education to align with contemporary needs and promote skill-based learning. UNESCO's 2022 report offers 10 recommendations to advance technological education in India.

These recommendations are in keeping with the national vision of Digital India. These 10 recommendations are:

1. Consider the ethics of Artificial Intelligence in Education as an utmost priority
2. Rapidly provide an overall regulatory framework for Artificial Intelligence in Education
3. Create effective public-private partnerships

4. Ensure that all students and teachers have access to the latest technology
5. Expand AI literacy efforts
6. Attempt to correct algorithmic biases and the resulting discrimination
7. Improve public trust in Artificial Intelligence
8. Request the private sector to better involve students and educationists in developing AI products
9. Place ownership of data with the students
10. Embrace the versatility of Artificial Intelligence in Education systems

India's commitment at G20 Platform: Making Tech enabled Learning more Inclusive, Qualitative and Collaborative at every level

- India's G20 Presidency spotlighted inclusive and sustainable development, with education as a key focus. The 2023 Education Working Group emphasized promoting inclusive, high-quality education and lifelong learning, highlighting India's rich knowledge heritage.
- The G20 Indian Presidency Education Working Group Report 2023 highlights the role of technologies in learning, the rise of blended learning, and the need for strategic digital transformation, particularly for emerging technologies like AI.
- The report highlights key components for enhancing tech-enabled learning: coordination, content, connectivity, capacity, culture, and cost. emphasising the importance of data ecosystems and analytics in improving education management.
- The G20 outcome document underscores the commitment to digital technologies for inclusive education, advocating for affordable, accessible ecosystems and resources in local languages to bridge the digital divide and ensure equitable, secure infrastructure.

Positive Outlook

Technology will revolutionize education by offering practical, real-world experiences, engaging audio-visual environments, and making learning enjoyable. It provides unlimited information, additional tools for teachers, and fosters interactive, collaborative learning, shaping the future of education. The benefits envisaged for digital education are as follows:

- Digital education has democratized learning, making high-quality resources accessible to a wider population. With widespread smartphone use and affordable internet, students nationwide can access lectures, study materials, and interactive sessions, levelling the educational playing field.
- Second, Digital education encourages pupils' inventiveness and originality, offering immersive learning that fosters critical thinking and problem-solving, equipping students for the modern workforce's need for flexibility and creativity.
- Digital platforms enable personalized learning, adapting materials to each student's preferences and pace, ensuring no one is left behind, thus enhancing understanding and academic performance.
- Digital education facilitates global collaboration and knowledge sharing, enabling students to work with peers worldwide, join international webinars, and gain diverse perspectives, fostering a broader, more global outlook.
- Digital education supports lifelong learning by enabling professionals to reskill and upskill online, adapting to industry changes and tech advancements. Online courses and certificates enhance job prospects and boost the economy.

Challenges

- To advance education in India, we must enable billions to realize their learning potential and foster cooperation. Learning should extend beyond classrooms, with goals of inclusive, collaborative education, despite existing obstacles.
- The digital divide, uneven ICT access, and lack of digital literacy hinder nationwide digital learning growth, especially in underprivileged communities. Limited internet access and devices worsen educational inequities and outreach challenges.
- Addressing the digital infrastructure in Indian schools is crucial for building a resilient system and keeping pace with digitalization. UDISE+ 2021-22 data shows that only 47.5% of schools have computers, 33.9% have internet, and 14.9% have smart classrooms, highlighting the need for improvement.

- Second, there is still effort to be conducted to ensure the reliability and quality of online instructional materials. It is vital to select and validate trustworthy sources due to the deluge of information available on the internet. To maintain educational standards, educators and legislators need to put strong procedures for quality control and content monitoring in place.
- Digital education demands a shift in teaching strategies and teacher training. Extensive professional development is needed for effective tech integration. Additionally, strict cybersecurity measures are crucial to protect student privacy and prevent cyberbullying, phishing, and data breaches.
- Digital education may reduce interpersonal skills and increase social isolation. Balancing screen time with offline interactions and extracurricular activities is crucial. Education policies should develop digital competencies, including critical thinking, creativity, and problem-solving skills.

Initiatives Taken to Expand Digital Education

India is a leading example of equity in digital learning, aiming to transform into a digitally empowered society. Its approach focuses on equitable access, with government policies and infrastructure supporting educational technology. The Ministry of Education enhances opportunities and quality through various digital education programs in research, training, and ICTs.

1. Enhancing and Strengthening the Scope of ICT under Samagra Shiksha Abhiyan: Samagra Shiksha, India's major scheme for school education, supports ICT and smart classrooms in all schools and funds quality e-content development through DIKSHA. The scheme aims to ensure equitable, lifelong learning for all students nationwide.

2. National Digital Library (NDL) Rashtriya E-Pustakalaya: This digital library platform enhances access to non-academic books for children across India, offering 10,000 books in 100+ languages within 2-3 years. Currently, 1,000 books in 23 languages are available, bridging the digital divide and promoting reading habits.

3. e-Jaadul Pitara (<https://ejaadupitara.ncert.gov.in>): Jadul Pitara and its digital version are play-based learning materials for children aged 3 to 8. They include playbooks, toys, puzzles, and more, reflecting local culture and accommodating diverse learning needs.

4. PM e-Vidya 'DIKSHA': DIKSHA is a national platform for school education, used by all States/UTs and central boards like CBSE and NIOS. It supports e-content development and capacity building for learners, teachers, and administrators.

- DIKSHA hosts over 6,500 textbooks with QR codes and 3.51 lakh digital resources, including audio-visual content, interactive materials, and lesson plans in 84 languages. Contributions from various partners have added over 2.55 lakh content pieces.
- The National Institute of Open Schooling (NIOS) has joined DIKSHA, uploading over 3,300 contents, including videos and e-textbooks, for secondary and senior secondary levels. NIOS aims to use DIKSHA to promote equitable, inclusive education.

Conclusion

To prepare children for a sustainable future, technology will foster lifelong learning and adaptability. The Indian government is committed to ensuring equitable education access for all students, including those in remote areas, making digital learning universally accessible. Digital education can transform Indian education by bridging the digital divide, ensuring content quality, enhancing educator readiness, supporting cybersecurity, and fostering holistic development. With collaborative efforts, India can lead in creating an innovative, inclusive education system.