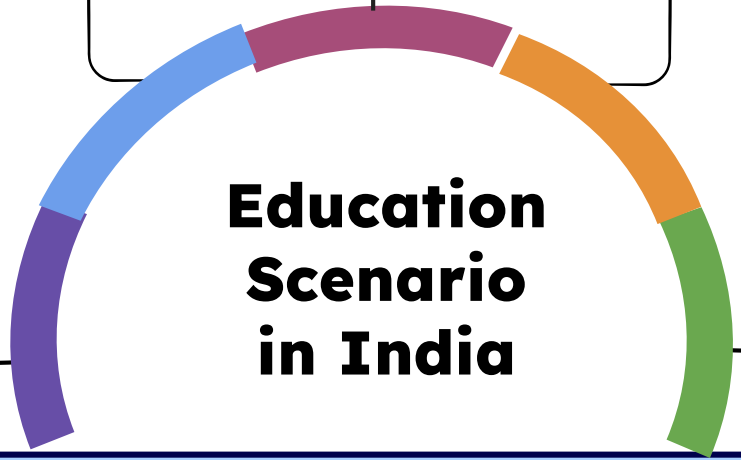
Imparting equitable quality education
and lifelong learning is the goal

CPD of
10 million Teachers
is a challenge

Skill training of youth
(two third population)

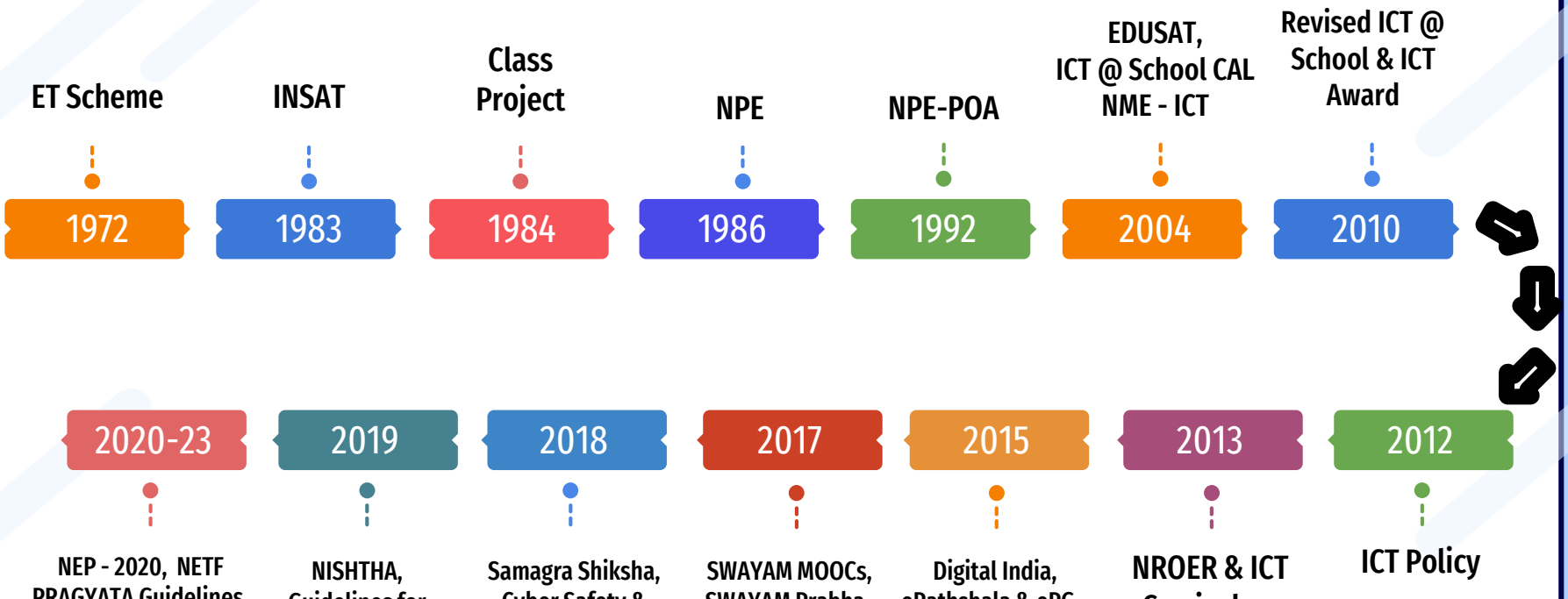
1.3 bn. People
1.5 million Schools
900+ universities
17000+ TEIs
330 million students

Bridging the
Digital Divide
is the goal



Education Scenario in India

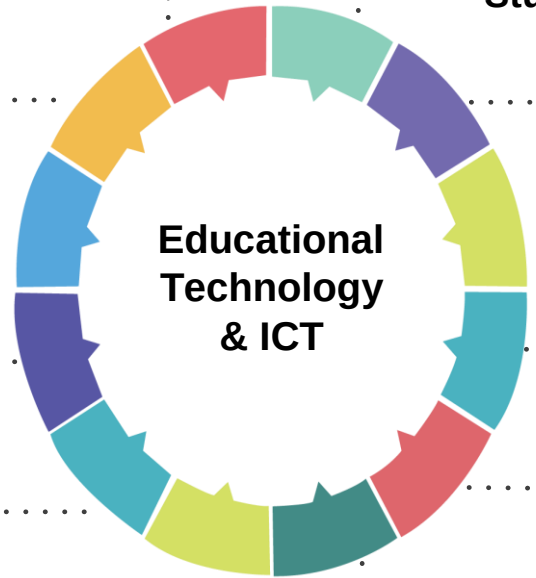
ICT Use in India: Policy Directions



NEP 2020 - Thrust of Technological Interventions

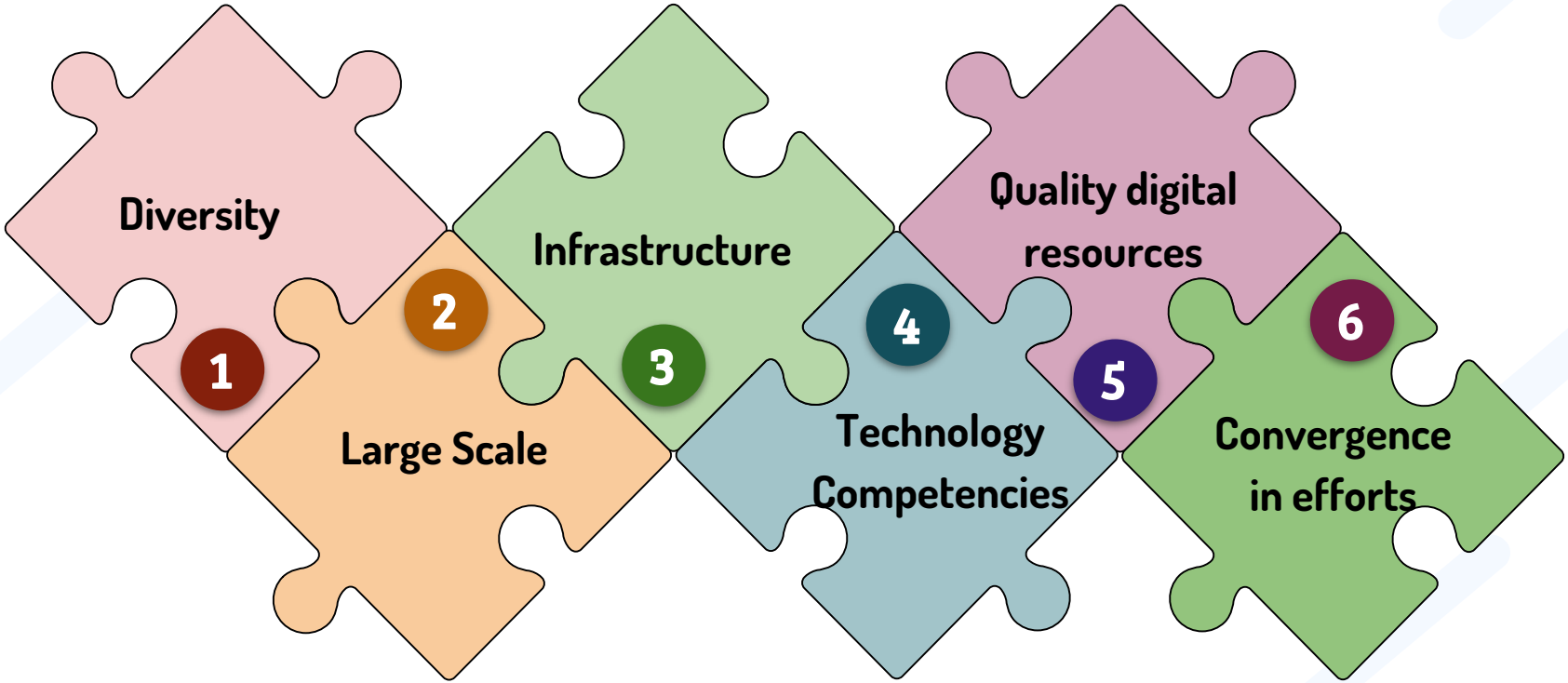
- Teaching-learning & evaluation processes
- Supporting teacher preparation & professional development
- Enhancing educational access
- Streamlining educational management and administration
- Removing language barriers
- Access to Divyang students

NEP-2020: Recommendations for Online and Digital Education



- Digital Infrastructure
- Building Digital competencies of Students
- Portals, Apps and Tools
- Content-Pedagogy-Technology Integration, Use of Assistive Technologies
- Digital Resources
- Capacity building of Teachers,Teacher Educators
- Telecast and Broadcast
- Laying down Standards
- eGovernance
- Online Assessment and Examination
- Intensive Research in ET

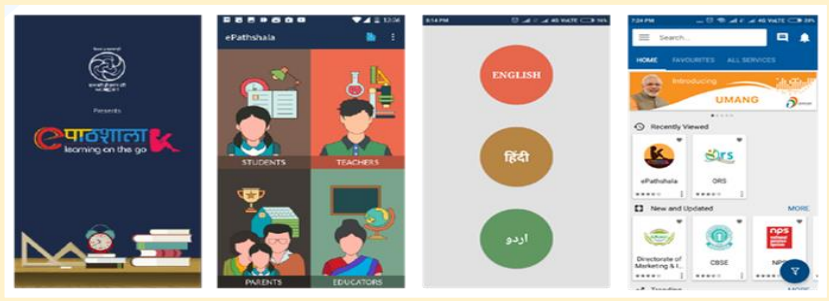
Issues & Challenges of Implementing Technology in Education



Major Digital Initiatives

1. PMeVIDYA
2. DIKSHA
3. ePathshala
4. NISHTHA
5. SWAYAM
6. ICT Curriculum

ePathshala



 # 19,29,88,268 visitors on Portal
 # 30 M users in UMANG

App Rating

- 4.3 on Google play store
- 3.5 on Apple Store

App downloads/Users

- 55,47,565 on Google
- 21,61,272 on Apple

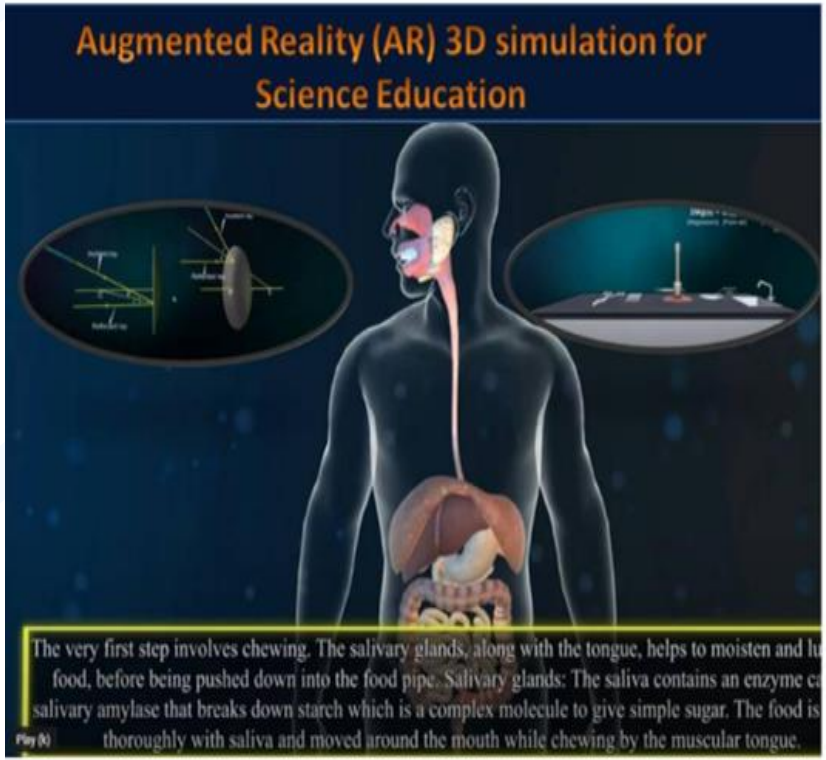
 # Total Books as ePub: 608
 # Total no of Flipbook: 539

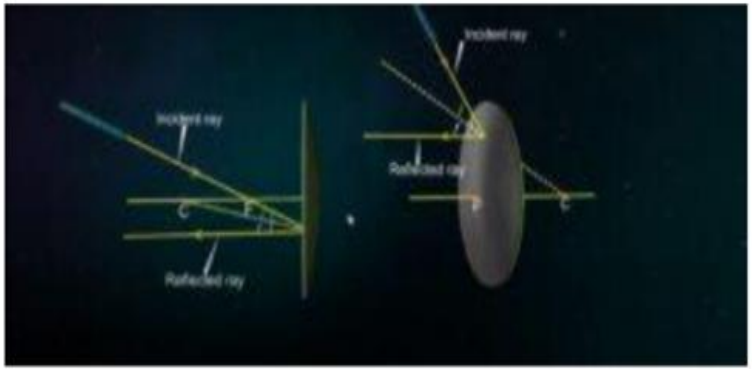
https://https://epathshala.nic.in/

Dissemination through Educational Apps

DIKSHA | ePathshala | NISHTHA | PMeVidya - AR | NAS | ePathshala Scanner | SSP Mauritius | NCF | DiSaNC | PRASHAST

Agumented Reality (AR)





https://play.google.com/store/apps/details?id=com.ncert.ARApps&hl=en_IN&gl=US&pli=1

PRASHAST

https://play.google.com/store/apps/details?id=com.dscs.app&hl=en_IN&gl=US&pli=1

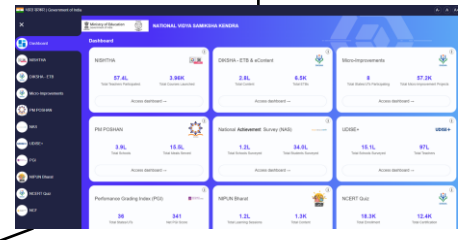
https://ncert.nic.in/pdf/DSCS_booklet.pdf

Vidya Samiksha Kendra (VSK)

Vidya Samiksha Kendra : helping us see & monitor policy implementation and drive reforms

DATA FROM DIKSHA PROVIDES THE ABILITY TO SEE AND EMPOWER RELEVANT STAKEHOLDERS

Visibility: 'Ability to See' in real time



Insights: 'Ability to Make Sense' of data

Actionability: 'Ability to Amplify Actions' through coordinated efforts

https://diksha.gov.in/

PM e-VIDYA

PM e-VIDYA focuses on unification of efforts, enabling multi-mode access to education

PM e-Vidya focuses on developing multi channel learning continuum

Television	Radio	DIKSHA	Special e-Content	Online Courses
One Class, One TV Channel	Radio Broadcast / Podcast/ Community Radio	One Nation, One Platform	E-content for specially abled DIVYANG (CWSN)	Online Courses for School Education

DIKSHA, Television and Radio are the focus of discussion for resilient and coherent access

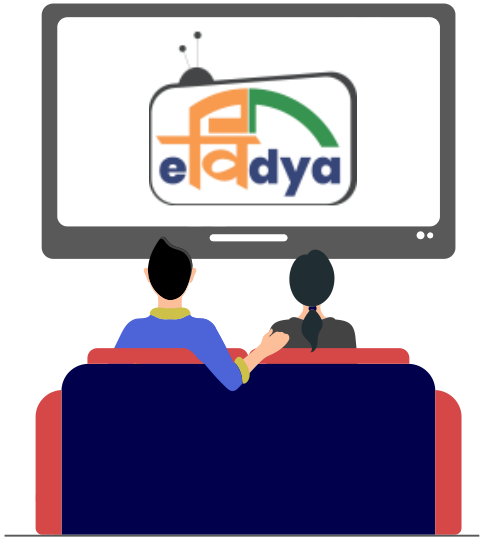
Television

- 12 DTH TV Channels on 24×7 basis daily and simulcast on Jio TV App, Private cable operators, YouTube channel etc.
- 6,903 curriculum based videos developed for school education in English, Hindi including Indian Sign Languages (ISL) including vocational education
- One hour live session for each class for clarification of doubts
- IVRS support for addressing queries of students

Present status of PM eVIDYA 12 DTH TV Channels

6,789 video programmes
Both in English and Hindi medium for classes 1-12

4,247 ISL Programmes
ISL video lessons telecast



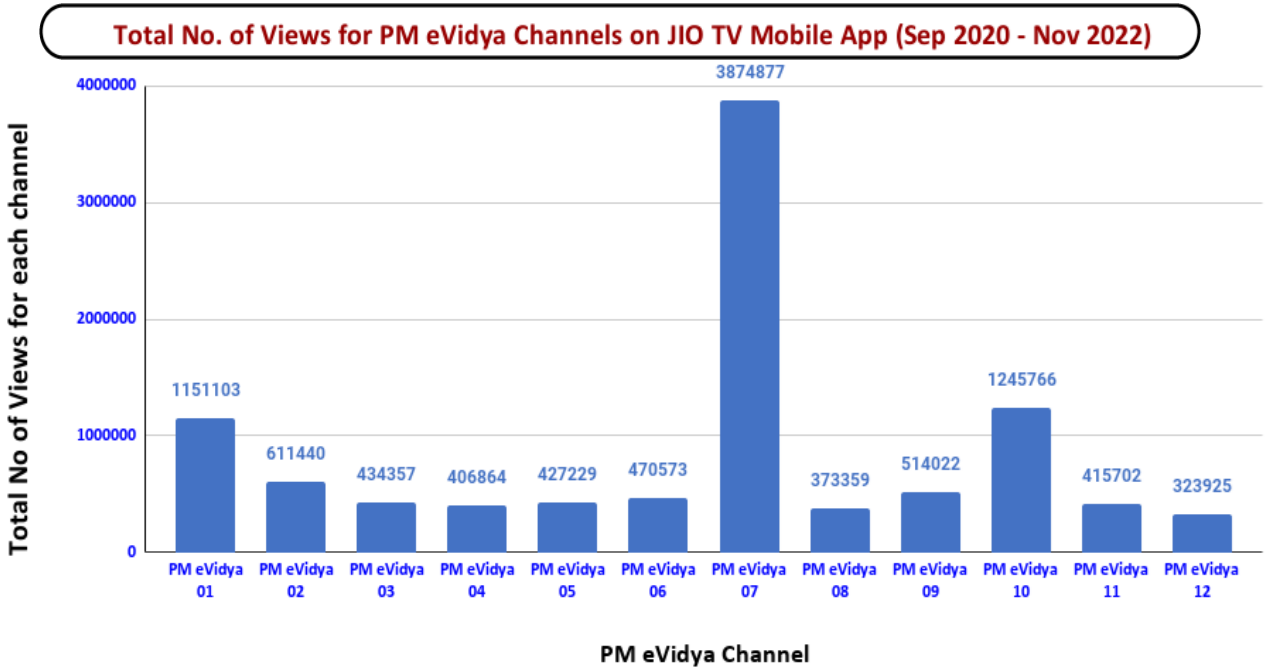
5,416 Live Show
Covering 3435.5 hours based on AAC

9,422 Content Reviewed
NCERT, NIOS, NVS, RILM, States/UTs

3,994 pieces of curriculum-based radio programmes broadcasted on 398 Radio Stations & 2,557 live sessions on iRadio and JioSaavn Mobile apps

Viewership details

PM eVIDYA Channel



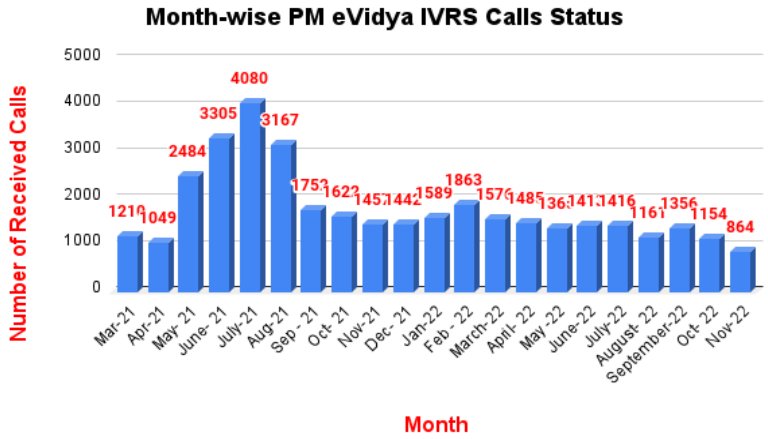
Feedback Mechanism

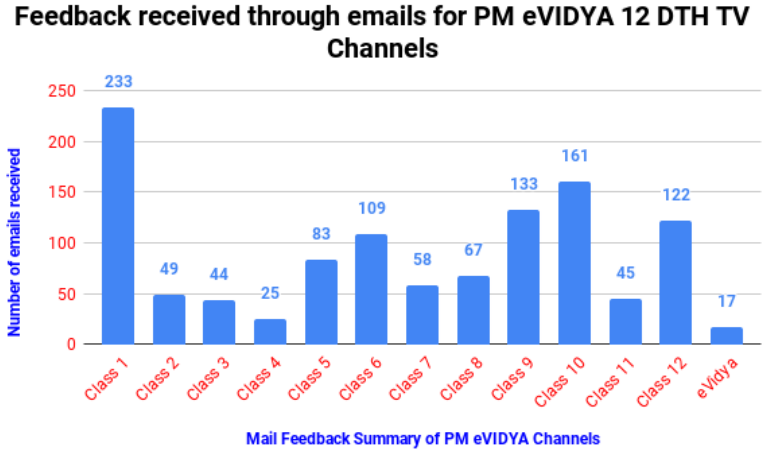
IVRS, Email & WhatsApp Group

Radio Broadcast

TV Telecast

- Email: **1,182** Emails received
- PM eVIDYA IVRS no. (8800440559)- **40,949** calls received
- Manodarpan IVRS no. (8448440632)- **23,714** calls received

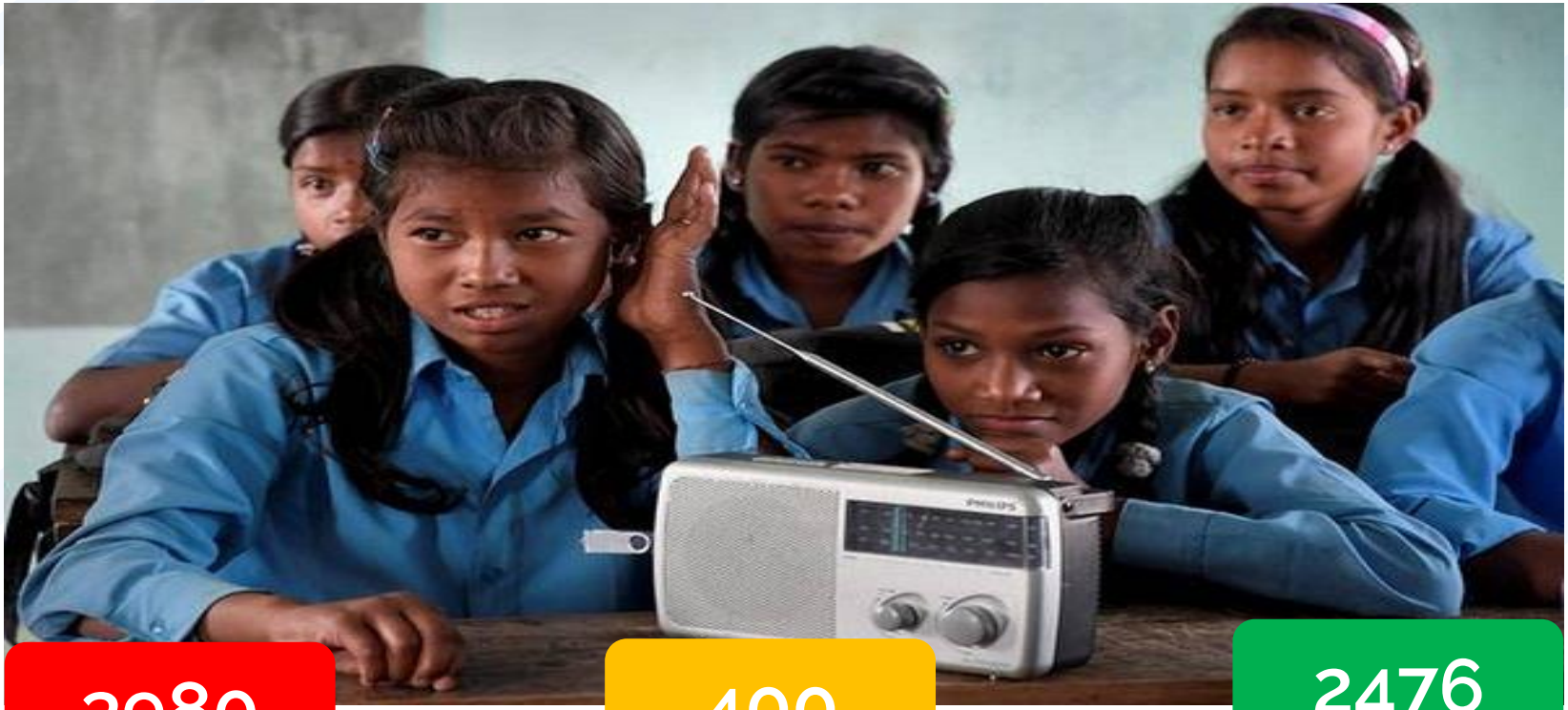




Radio

- 3,980 pieces of curriculum-based radio programmes (Classes 1 -12)
- Broadcast on 400 Radio Stations (11 GyanVani FM Radio Stations, 257 Community Radio Stations, 132 All India Radio stations), iRadio and JioSaavn Mobile apps
- 2,476 live programs podcast on iRadio

Radio



3980

Curriculum based radio program(Class 1-12)

400

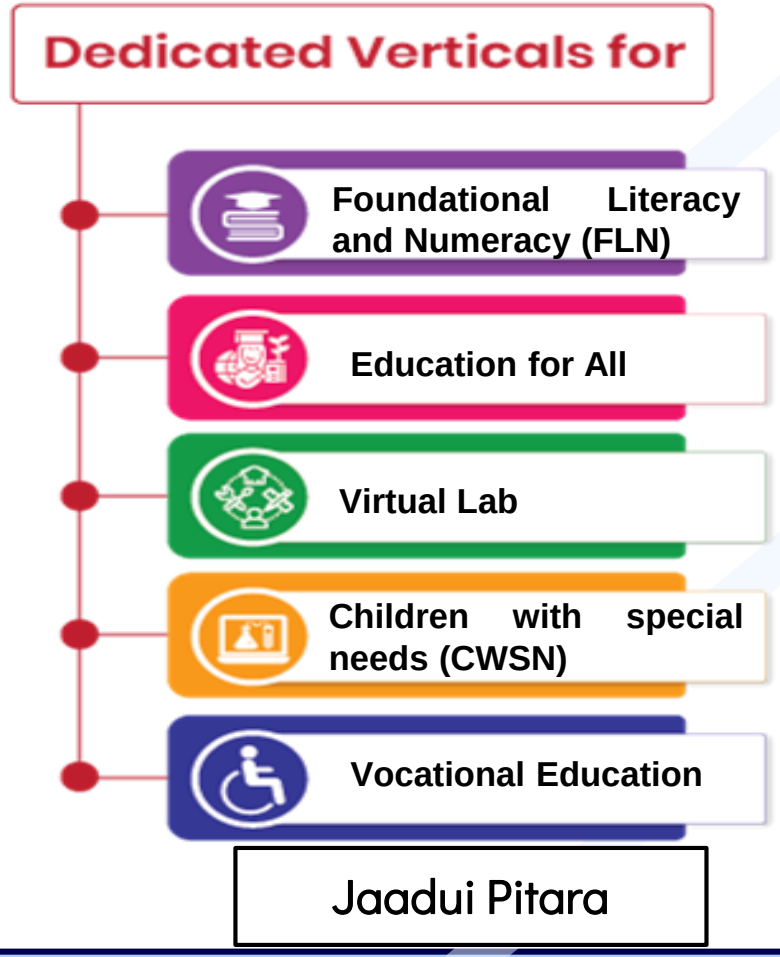
Radio Stations

2476

LIVE radio podcasts

DIKSHA

- Repository of Open Educational Resources
- Collaborative Platform
- Curriculum-aligned content
- Analytics
- Multilingual support
- Offline access



https://diksha.gov.in/

DIKSHA

- 6500+ ETBs by States / UTs
- 3,12,930+ eContent
- 9300 + eCourses
- 31.2 million page hits on daily basis
- Supports 36 languages Including 22 scheduled languages and indian sign languages (ISL).

https://diksha.gov.in/

CIET - NCERT develops…

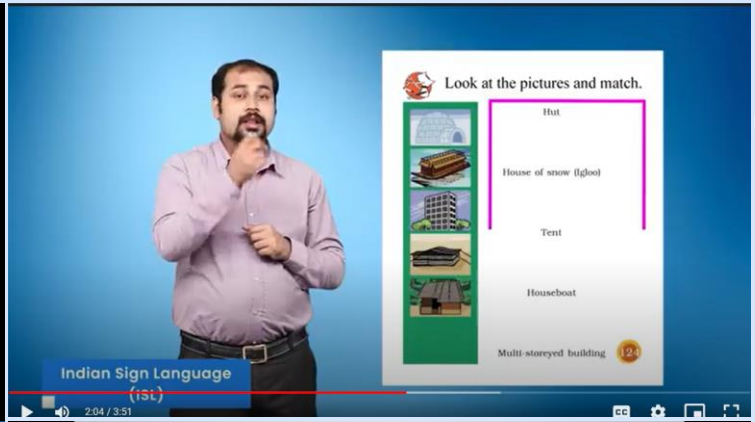
variety of digital contents

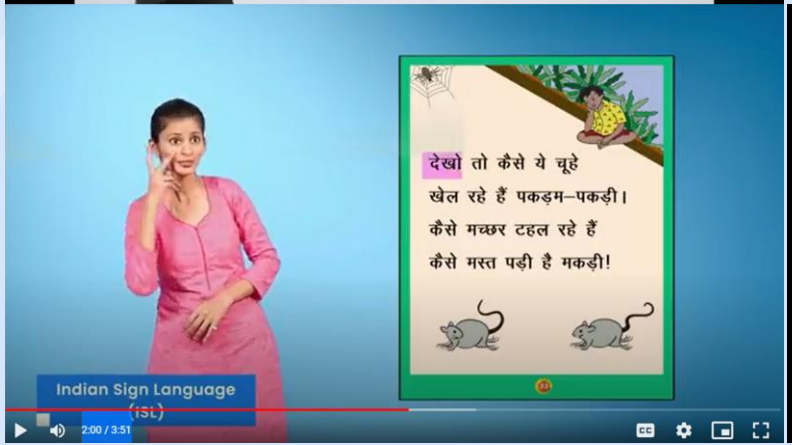
- Energized books
- Assessment questions
- Infographics
- eCourses
- Guidelines/ Handbooks
- Videos, ISL videos
- Interactive & Immersive content
- Audios, Talking Books, Audio Books
- Worksheets

eContents ….

- eContent in curricular and generic areas various Indian Languages
- Age appropriate content for various stakeholders - Students, Teachers, Teacher Educators, Parents etc
- Universal Design of Learning (UDL) based content
- Collaboration and Partnership

eContents based on UDL





DIKSHA

DIKSHA's building blocks were used for multiple use cases

Energised Textbooks

Teacher Professional Development

Question Bank

Content Sourcing

Content Authoring

Quizzes

Content Consumption

Data Tools & Dashboards

Chatbot

Vidya Samiksha Kendra - CCC
System to monitor, mentor, manage the whole ecosystem

Digital Credentials

Collaboration

Phygital

cQube

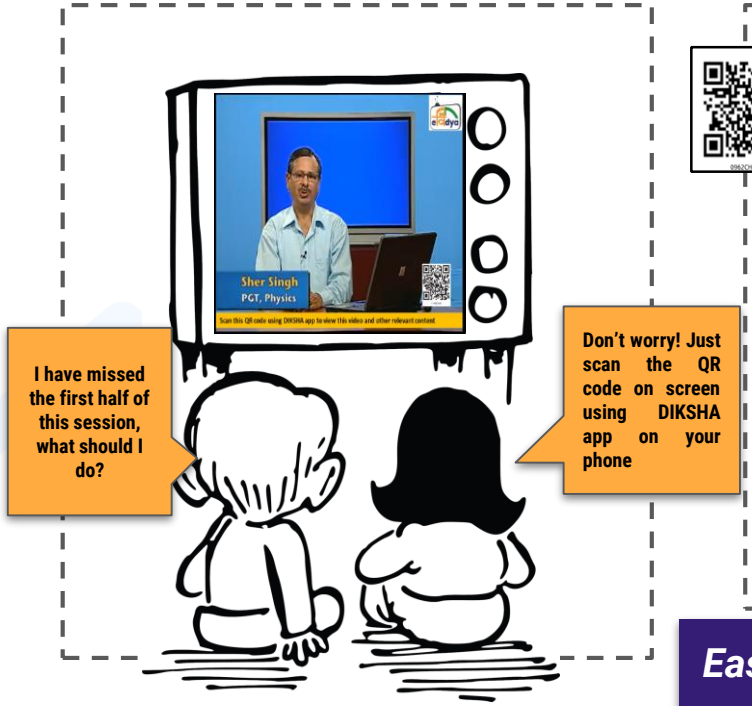
Surveys

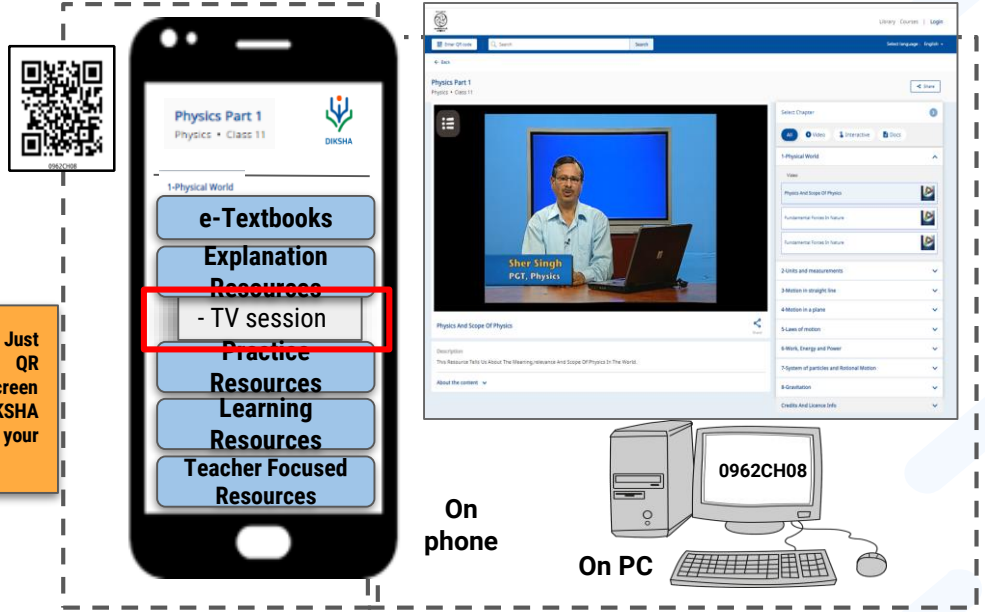
Language Translations

Mentoring

Sunbird Registry and Credentials

NCERT has leveraged DIKSHA to enable Coherent Access





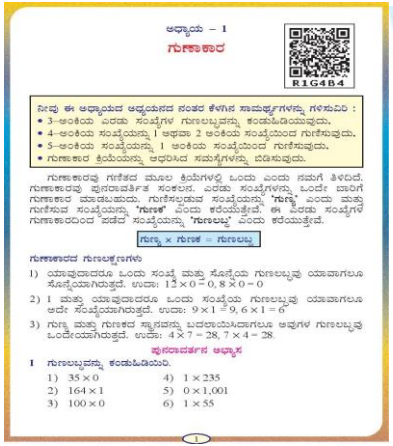
Easy access of content for Chapter wise across grades and subjects through DIKSHA, TV, Radio

Phygital

Bridging of physical and digital worlds by ‘energizing’ textbooks...

...which lead to ease of access to relevant digital content across the nation and enable continuity of learning

State board, Grade 5th Textbook


ಅಧ್ಯಾಯ – 1

ಗುಣಾಕಾರ

R1G4B4

ನೀವು ಈ ಅಧ್ಯಾಯದ ಅಧ್ಯಯನದ ನಂತರ ಕೆಳಗಿನ ಸಾಮರ್ಥ್ಯಗಳನ್ನು ಗಳಿಸುವಿರಿ :

- 3–ಅಂಕಿಯ ಎರಡು ಸಂಖ್ಯೆಗಳ ಗುಣಲಬ್ಧವನ್ನು ಕಂಡುಹಿಡಿಯುವುದು.
- 4–ಅಂಕಿಯ ಸಂಖ್ಯೆಯನ್ನು 1 ಅಥವಾ 2 ಅಂಕಿಯ ಸಂಖ್ಯೆಯಿಂದ ಗುಣಿಸುವುದು.
- 5–ಅಂಕಿಯ ಸಂಖ್ಯೆಯನ್ನು 1 ಅಂಕಿಯ ಸಂಖ್ಯೆಯಿಂದ ಗುಣಿಸುವುದು.
- ಗುಣಾಕಾರ ಕ್ರಿಯೆಯನ್ನು ಆಧರಿಸಿದ ಸಮಸ್ಯೆಗಳನ್ನು ಬಿಡಿಸುವುದು.

ಗುಣಾಕಾರವು ಗಣಿತದ ಮೂಲ ಕ್ರಿಯೆಗಳಲ್ಲಿ ಒಂದು ಎಂದು ನಮಗೆ ತಿಳಿದಿದೆ. ಗುಣಾಕಾರವು ಪುನರಾವರ್ತಿತ ಸಂಕಲನ. ಎರಡು ಸಂಖ್ಯೆಗಳನ್ನು ಒಂದೇ ಬಾರಿಗೆ ಗುಣಾಕಾರ ಮಾಡಬಹುದು. ಗುಣಿಸಲ್ಪಡುವ ಸಂಖ್ಯೆಯನ್ನು **'ಗುಣ್ಯ'** ಎಂದು ಮತ್ತು ಗುಣಿಸುವ ಸಂಖ್ಯೆಯನ್ನು **'ಗುಣಕ'** ಎಂದು ಕರೆಯಲ್ಪಡಲಾಗಿದೆ. ಈ ಎರಡು ಸಂಖ್ಯೆಗಳ ಗುಣಾಕಾರದಿಂದ ಪಡೆದ ಸಂಖ್ಯೆಯನ್ನು **'ಗುಣಲಬ್ಧ'** ಎಂದು ಕರೆಯುತ್ತೇವೆ.

ಗುಣ್ಯ × ಗುಣಕ = ಗುಣಲಬ್ಧ

ಗುಣಾಕಾರದ ಗುಣಲಕ್ಷಣಗಳು

1) ಯಾವುದಾದರೂ ಒಂದು ಸಂಖ್ಯೆ ಮತ್ತು ಸೊನ್ನೆಯ ಗುಣಲಬ್ಧವು ಯಾವಾಗಲೂ ಸೊನ್ನೆಯಾಗಿರುತ್ತದೆ. ಉದಾ: $12 \times 0 = 0, 8 \times 0 = 0$

2) 1 ಮತ್ತು ಯಾವುದಾದರೂ ಒಂದು ಸಂಖ್ಯೆಯ ಗುಣಲಬ್ಧವು ಯಾವಾಗಲೂ ಅದೇ ಸಂಖ್ಯೆಯಾಗಿರುತ್ತದೆ. ಉದಾ: $9 \times 1 = 9, 6 \times 1 = 6$

3) ಗುಣ್ಯ ಮತ್ತು ಗುಣಕದ ಸ್ಥಾನವನ್ನು ಬದಲಾಯಿಸಿದಾಗಲೂ ಅವುಗಳ ಗುಣಲಬ್ಧವು ಒಂದೇಯಾಗಿರುತ್ತದೆ. ಉದಾ: $4 \times 7 = 28, 7 \times 4 = 28$.

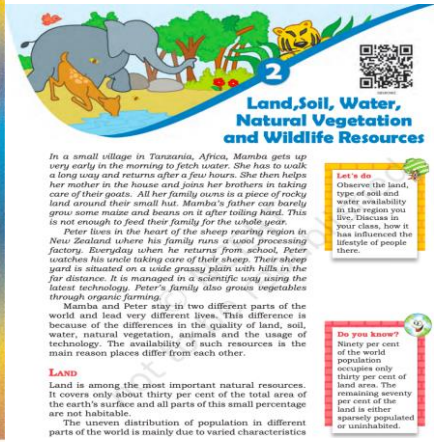
ಪುನರಾವರ್ತನಾ ಅಭ್ಯಾಸ

I ಗುಣಲಬ್ಧವನ್ನು ಕಂಡುಹಿಡಿಯಿರಿ.

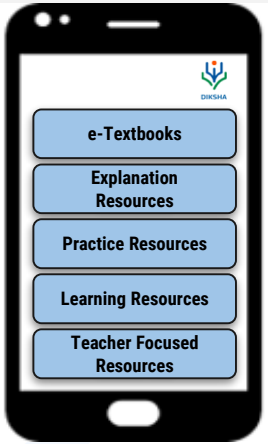
1) 35×0
2) 164×1
3) 100×0
4) 1×235
5) $0 \times 1,001$
6) 1×58

1

NCERT, Grade 8th textbook



QR Code linking to relevant e-content (student and teacher facing content)



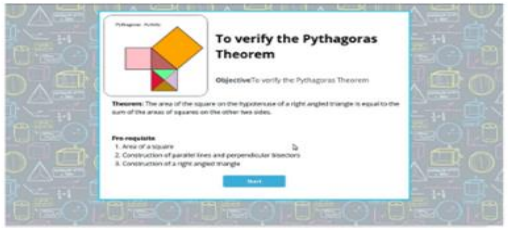
Virtual Labs

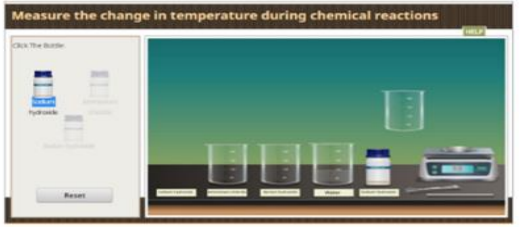
200+ Virtual Labs

Glimpses of AR, VR labs and Experiential learning center

Virtual labs
Developed in collaboration with CDAC (Mumbai) and AMRITA Vidyapeetham
Available on DIKSHA portal/app

Link for Virtual Labs vertical- https://diksha.gov.in/virtuallabs.html





Assistant Professor in Educational Technology

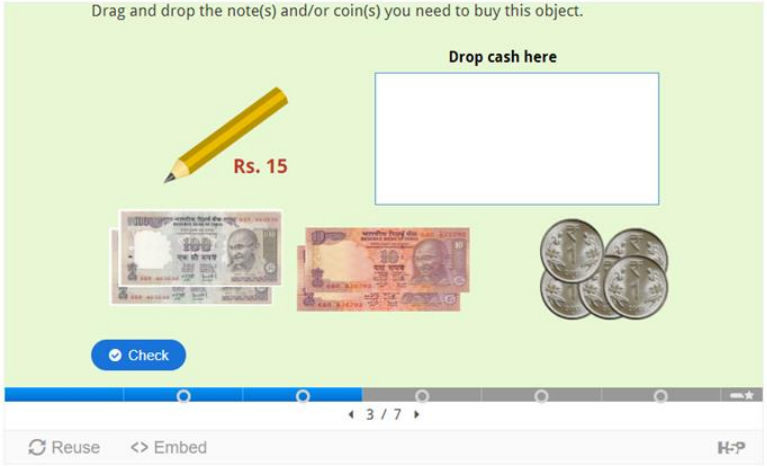
Page 7 / 11

Glimpses of AR, VR labs and Experiential learning center

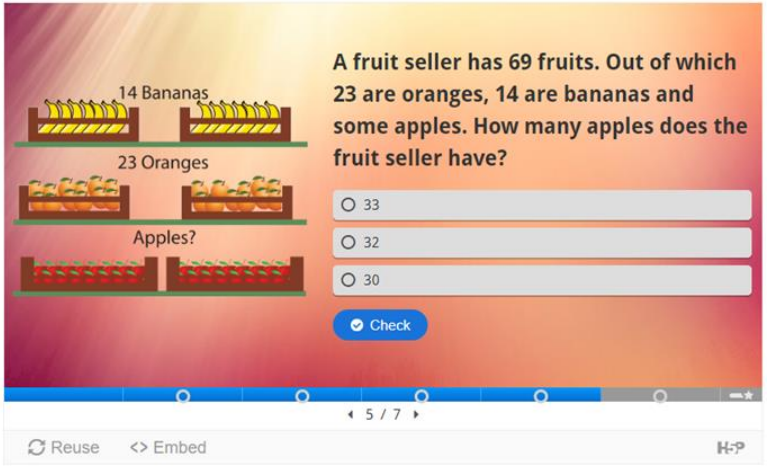
https://diksha.gov.in/virtuallabs.html

Game Based Learning

Place Value(Ones, Tens and Hundreds)



Addition and Subtraction



http://itfdigitalgames.ncert.org.in/

Experiential Lab

Glimpses of AR, VR labs and Experiential learning center

Experiential Learning Centre
Developed in collaboration with Jubilant Bhartia and Ganpat University

Continuous Professional Development (CPD)

Continuous Professional Development (CPD)

NISHTHA	42 Lakh (Ele), 7.2 Lakh (Sec), 12.6 Lakh (FLN), around 1.2 Lakh (ECCE)
CPD Courses	3,67,657 Certificates issued
MOOCs for School Education	3,70,000 enrolled including students, teachers, parents and civil servant aspirants
Online Capacity Building on ET/ ICT	4 Lakh + Certificates issued

Platforms: MOODLE, SUNBIRD, OPEN edX, Google Course Builder

NISHTHA

NISHTHA (Elementary Level)

NISHTHA (Secondary Level)

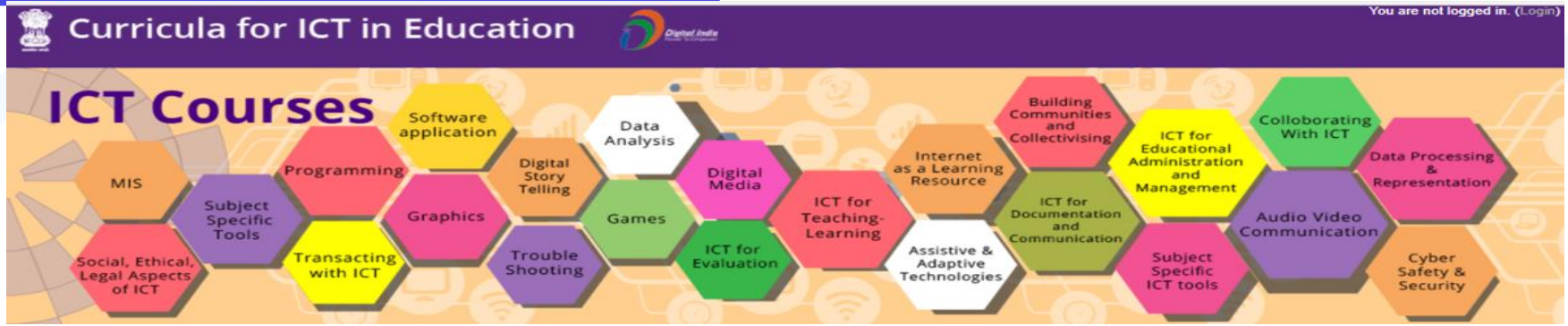
NISHTHA for NIPUN Bharat

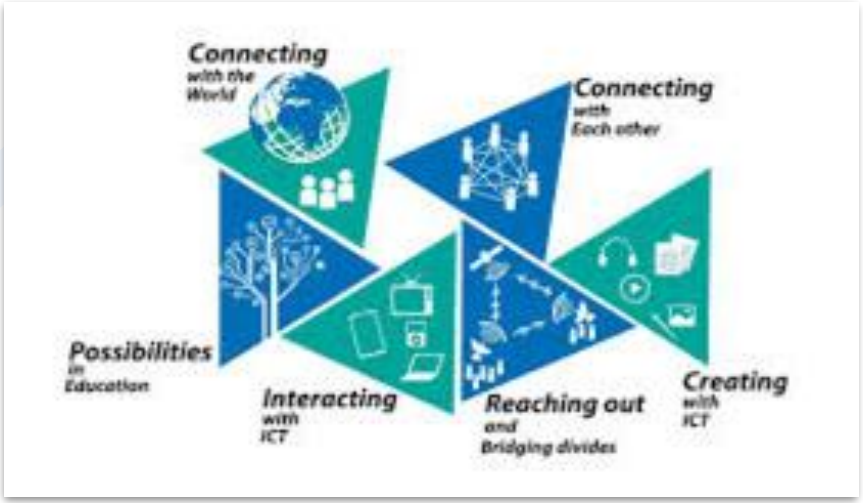
NISHTHA (ECCE) **(Ongoing)**

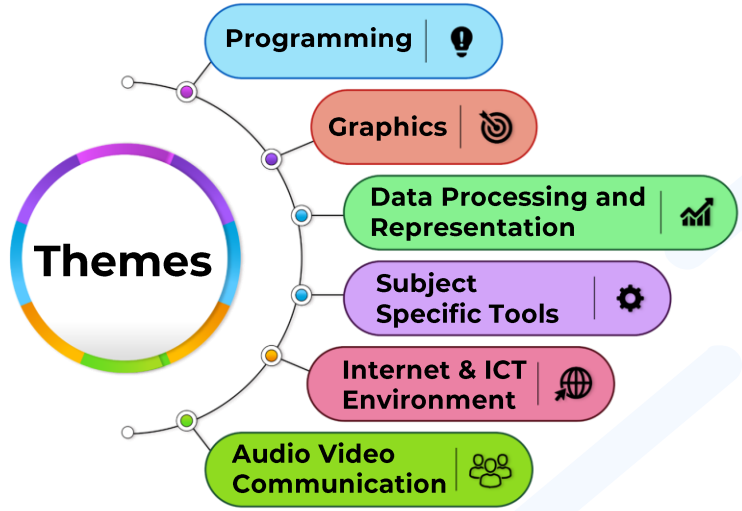
18 Courses	12 Courses	10 Courses	06 Courses
30 States/ UTs and 7 autonomous organisations under MoE and MoD	33 States/UTs and 8 autonomous organization under MoE, MoD and MoTA	33 States/UTs and 5 autonomous organizations under MoE	30 States/ UTs initiated POs, CDPOs, Supervisors, DIET faculty from DRU for NFE & AE
11 language - Assam, Bengali, Bodo, English, Kannada, Hindi, Telugu, Odia, Gujarati, Punjabi, Urdu	10 language - Hindi, English, Urdu, Gujarati, Punjabi, Telugu, Kannada, Bengali, Marathi and Odia	11 language - Hindi, English, Urdu, Gujarati, Punjabi, Telugu, Kannada, Odia ,Bengali, Marathi and Mizo	2 languages - Hindi , English
42 Lakh	**7.2 Lakh**	**12.6 Lakh**	**Target -1.2 Lakh**

https://nishtha.nic.in/

ICT Curriculum







https://ictcurriculum.gov.in/

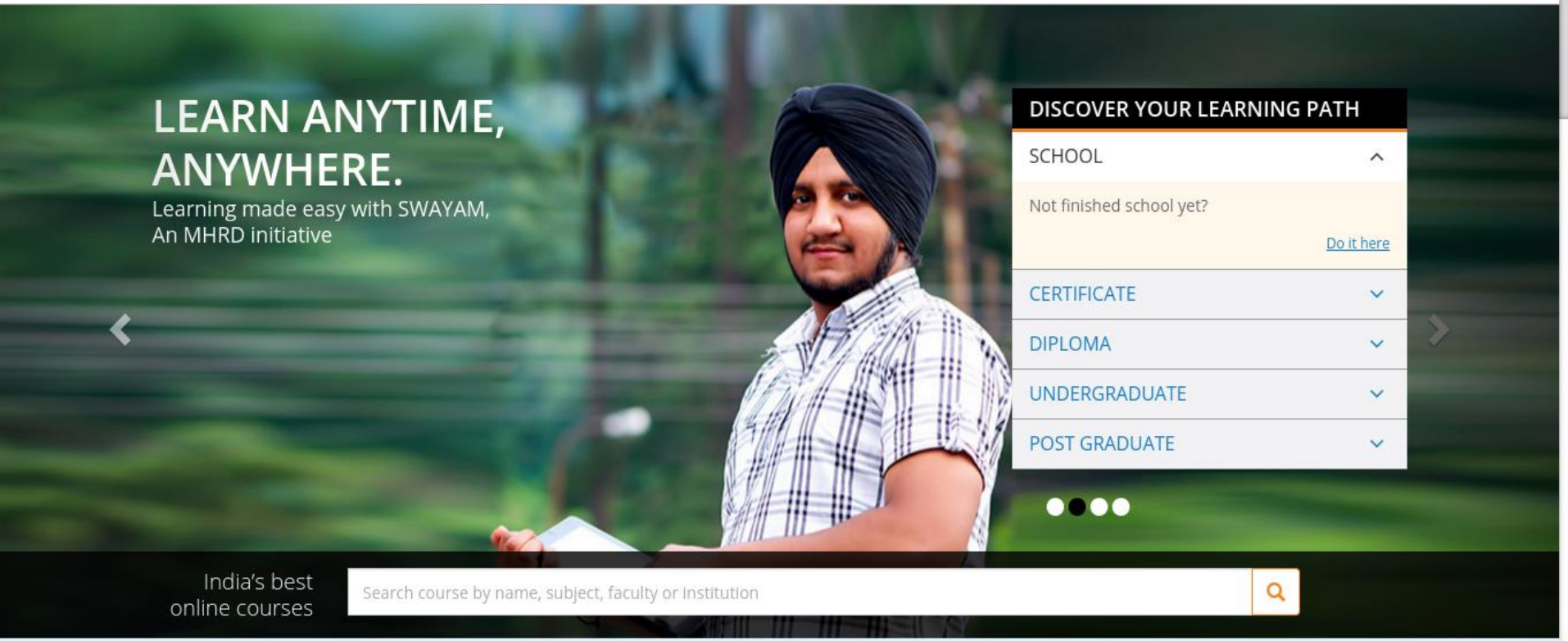
सत्यमेव जयते

MHRD | Government of India Ministry of Human Resource Development

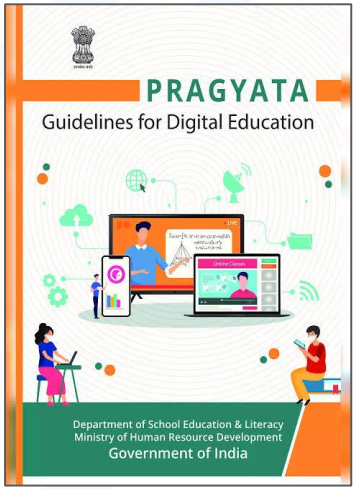
All India Council for Technical Education

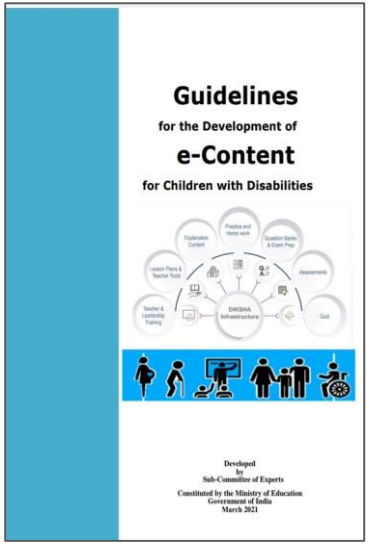
SWAYAM

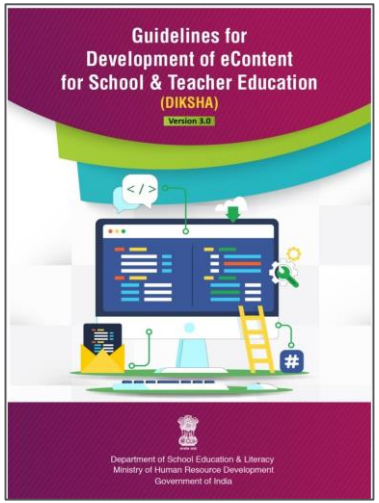
https://swayam.gov.in/



Standards & Guidelines for Digital Education

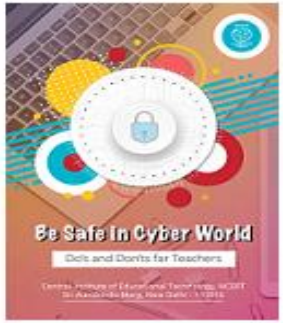


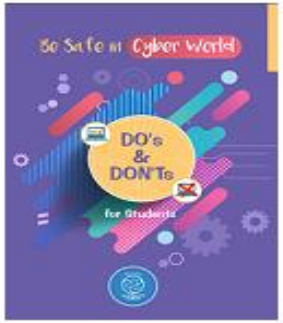




Cyber Safety Guidelines

English





Hindi

https://ciet.nic.in/pages.php?id=booklet-on-cyber-

International Collaboration

Trained master trainers of Mauritius on developing and disseminating OER, Developed a portal and mobile app

School Online Programme - Collaboration between Indian and Israel Schools

Trained master trainers of Nepal on developing and disseminating eContents and OER

School Online Programme - Collaboration between Indian and Korean Schools

Shared eContents developed by NCERT

Scope of ET

1. Development and dissemination of Contents - ebooks, eContents and its delivery through portals, apps, transmission
2. LMS, CMS, OER, online assessment, MIS, monitoring etc. through portals and apps
3. 21st Century Skills like - Communication, Cooperation, Collaboration, Critical Thinking, Creative Thinking, Problem Solving
4. Achieving Foundation Literacy and Numeracy addressing the large scale requirement

Scope of ET

5 Synchronous and Asynchronous Communication

6 Designing and use of online and offline technologies

7 Assistive Technologies for CWSN/DIVYANG

8 Reaching to the unreached and bridging digital divide and achieving Skill, Scale and Speed

Way Forward

Digital Infrastructure

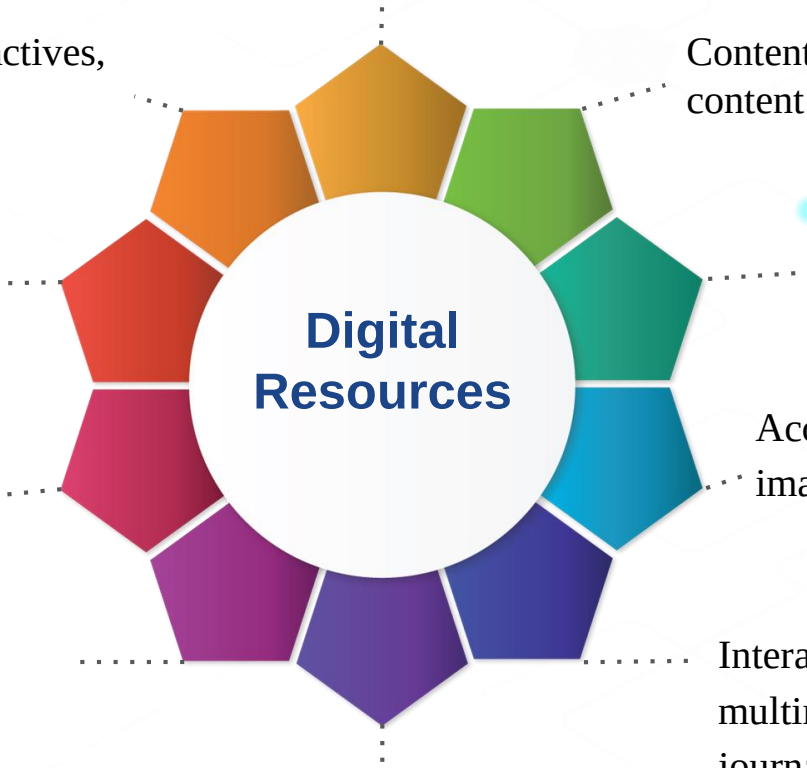
- ICT ecosystem in School Complex
- NDEAR : Digital Ecosystem
- Labs and ICT facility in classroom
  - Classroom facility - Digital Screen with computer/ laptop,
  - Laptop tray/ tablets for students access (Device per child)
  - Digital learning labs at national, state, district and school level
  - Operational Digital Board - Digital boards in schools at secondary stage
- Software
  - Free and Open Source Software for content development, teaching, learning and assessment
  - Customised Operating System with all Educational Software
- Gadgets and Applications
  - Assistive Technology gadgets like reading pen, alternative keyboards, single word scanner etc
  - Gadgets for using virtual reality and mixed reality resources
- Network and Connectivity
  - High speed internet connectivity
  - LAN connections for sharing resources offline at every school
  - Free internet facility for educational access to students and teachers
- Robust system for data storage, management, tracking at every school and at all levels - national, state, district, block
- Offline systems for content sharing and training local server, hard drives etc

Way Forward

Portals, Apps and Tools

- DIKSHA - Robust interoperable, evolvable public digital infrastructure for content creation, curation, dissemination and training
- Integration of Virtual Labs and development of dadicated sections for,FLN, Adult Education,Vocational Educationand CWSN on DIKSHA
- Development of FOSS based Educational Software
- Development of centralised MIS
- Robust LMS integrated with synchronous communication and assessment systems for adaptive learning
- Development of Indian language translation tools
- Integrating AI in educational platforms and apps
- Communication system like IVRS

Way Forward



Digital games based resources

Quality, engaging content - interactives, simulations, AR, VR etc

Content for CWSN - sign language content

Multiple languages including tribal languages

Simulated content for virtual lab

Offline content

Accessibility features like TTS, image description etc

Open licenced content

Interactive Books embedded with multimedia, interaction feature, journal, assessment etc

Self paced MOOCs

Way Forward

Telecast, Broadcast, IVRS support

- Transmission of curriculum based programmes through TV channels
- Audio programs to be disseminated through FM/AM channels, Community Radio channels
- IVRS support for students and teachers
- Dedicated Satellite Based Network for CPD and Simulcast
- Transmission of Innovative and Interactive programs

Way Forward

Building Digital Competencies - Teachers

Contextualised and Customised ICT competency framework for Teachers and School Leaders

Levels	Description
ICT Competencies	• Induction level 1 training on ICT basic skills in F-T-F for teachers for 120 hours • Induction level 2 training on ICT intermediate skills in blended mode for mentors for 50 hours • Induction level 3 training on ICT advanced skills in blended mode for ambassadors/ ICT coordinators for 50 hours

ICT - Pedagogy Integration Competencies	• Mandatory refreshers courses
	  ○ ICT-Pedagogy integration (50 hours)
	  ○ eContent development (50 hours)
	  ○ Social, ethical, legal and technical aspects of using ICT (50 hours)
	• Advanced refresher courses depending on requirement and specialisation like developing AR/ VR content, apps etc (50 hours/ refresher)

Cont...

Way Forward

Building Digital Competencies - Educators

CPD for **Teachers Educators** in blended & online mode in the following areas:

01 Development of localised and vernacular digital contents

02 ICT & ET Integration for Teaching-Learning and Assessment

03 Innovative pedagogies like online learning, flipped learning, mobile learning, blended learning etc.

04 Assessment, Evaluation, Mentoring, follow up using ICT

05 Disruptive, Assistive technologies, Cyber safety & security

06 Research and Innovation in ET/ ICT

Way Forward

Content - Pedagogy - Technology Integration

Stage	Scope of Integration
Foundational	Use of multimedia resources like video, interactives,games etc for teaching, learning and assessment
Preparatory	Use of digital resources like videos, interactives, games etc for teaching, learning and assessment
Middle	• Integration of digital resources, immersive technologies and subject specific tools for teaching, learning and assessment • Use of eportfolio, rubrics, interactive online assessment etc • ICT integrated projects in curricular subjects
Secondary Stage - 1 (class 9 & 10)	• Integration of digital resources, immersive technologies and subject specific tools for teaching, learning and assessment • Use of eportfolio, rubrics, self paced online assessment etc • Integration of personalised adaptive learning technologies and encourage self learning • ICT integrated projects in curricular subjects
Secondary Stage - 2 (class 11 & 12)	Including Secondary Stage -1, • Application based ICT integrated projects in curricular subjects • Integration of emerging trends like applications of AI, data mining, big date, cloud computing, block chain etc in context of curricular areas

Cont...

Way Forward

Content-Pedagogy-Technology Integration

ICT Pedagogy Integration Approaches

- Blended Approach
- Flipped Learning
- Mobile Based Learning
- Adaptive/ Personalised Learning
- Self Regulated Learning
- Game based Learning
- Virtual Learning
- Collaborative Learning etc

Cont...

Way Forward

Content-Pedagogy - Technology Integration

Concerns of ICT Pedagogy Integration

- Integrated approach across subjects is appreciated rather than dealing ICT as an individual entity
- Modeling approach is encouraged rather lecturing
- Open Education culture to be encouraged
- Ethical practices of using ICT to be integrated in the curricular areas
- Competencies to be focused than literacy
- Sufficient hands on practice to be integrated
- Cyber safety and security to be embedded in relevance
- Multi-modal approach to be used with appropriate technologies based on content, pedagogy in context
- Contextualising and customising content as per the need is essential
- AR, VR technologies to be integrated for engaging and interacting meaningfully

Way Forward

Online Assessment and Examination

- Anytime, anywhere Proctored examinations, certification and credit transfer at learner’s convenience and demand.
- Examination paper to be auto generated based on a large question bank.
- Learning outcome based assessment
- Auto generation of Competency graph for each learner based on acquiring competencies.
- Recording every achievement/attainment of student/teacher through centralised portal like National Academic Depository and DigiLocker.
- Adaptive assessment/testing based on level of achievement
- Holistic progress card

Way Forward

Laying Standards

- Content standards
  - Pedagogically structured digital contents, as per the cognitive level of learner in that age
  - Designing content as per Universal Design Learning (UDL) so that each content becomes accessible to all.
  - Generic concerns - gender, environmental, ethics, values, privacy, copyrights, etc
  - Audit process
- Technology Standards
  - Standards of Accessibility, Usability, Adaptability, Scalability, Sustainability, Interoperability.
- Digital Education Standards
  - screen time, ergonomics etc.

Way Forward

eGovernance

eGovernance System for educational planning & management at State and National level

- Centralized portal for recruitment, promotion and transfer of teachers and teacher educators
- Monitoring yearly mandatory 50 hours CPD of each and every teacher and teacher educator
- Mechanism for monitoring and recording various data related to student for example: health report, holistic progress card etc
- Electronic record-keeping at every level of school eco-system to save time, avoid duplicacy, etc.
- Automated maintenance of resources and infrastructure

Way Forward

Research in ET

Piloting and scaling of immersive technologies like AR, VR, AI etc. in teaching, learning and assessment

Best practices with respect to developing digital infrastructure, capacity building, low cost technologies, accessibility etc.

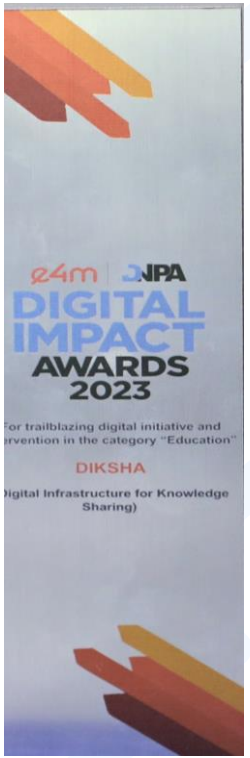
Innovative ways of ICT integration

Process perspectives & validation of eContents

Accessibility practices in digital spaces

Data management, policies, systems and strategies

Appreciations



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