

Virtual labs: Need, Perspective, and Scope



Date and Time

18 November, 2024

from 10:00 AM to 11:00 AM, Monday

Resource person



Prof. Amarendra P. Behera
Joint Director,
CIET-NCERT



Prof. Indu Kumar
National Coordinator,
DIKSHA, CIET-NCERT



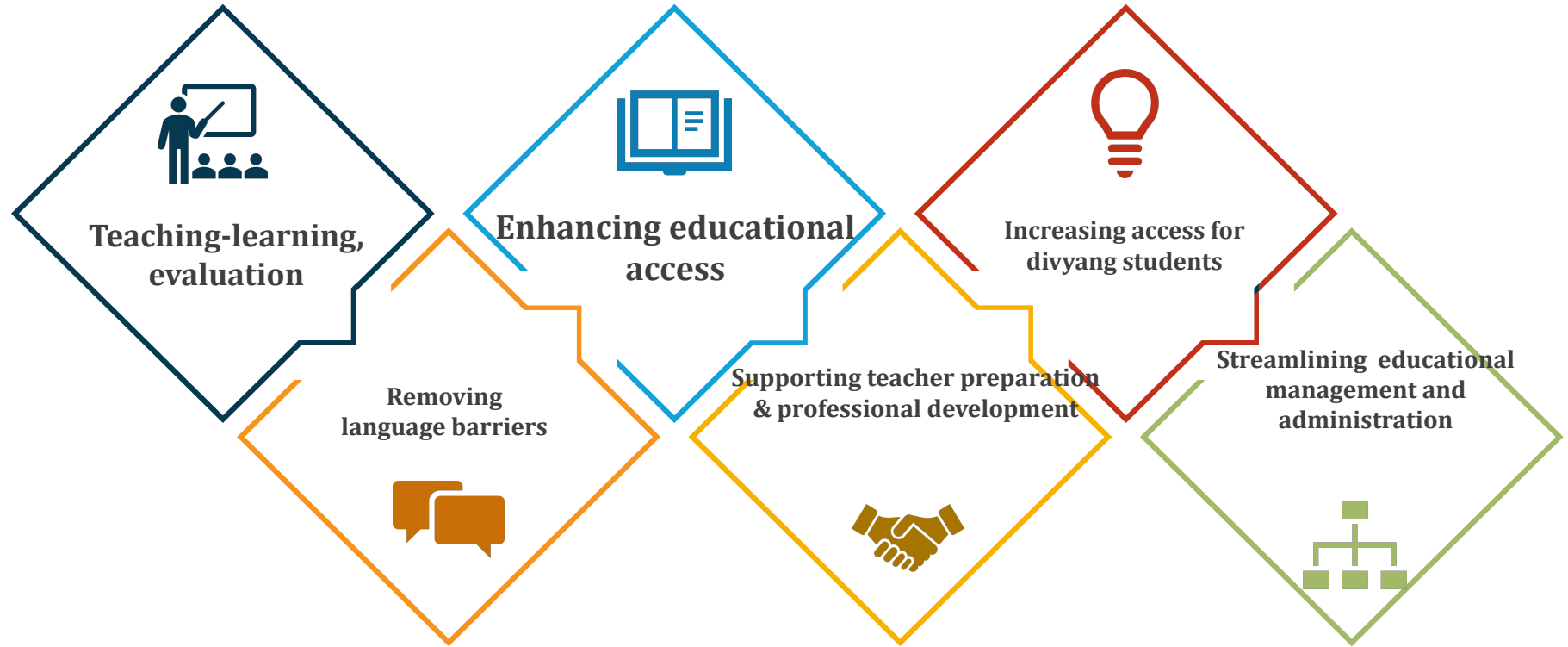
Dr. Praveen B Binjha
Associate Professor
DICT & TD, CIET-NCERT

Virtual Labs: Policy Perspective, Need and Scope

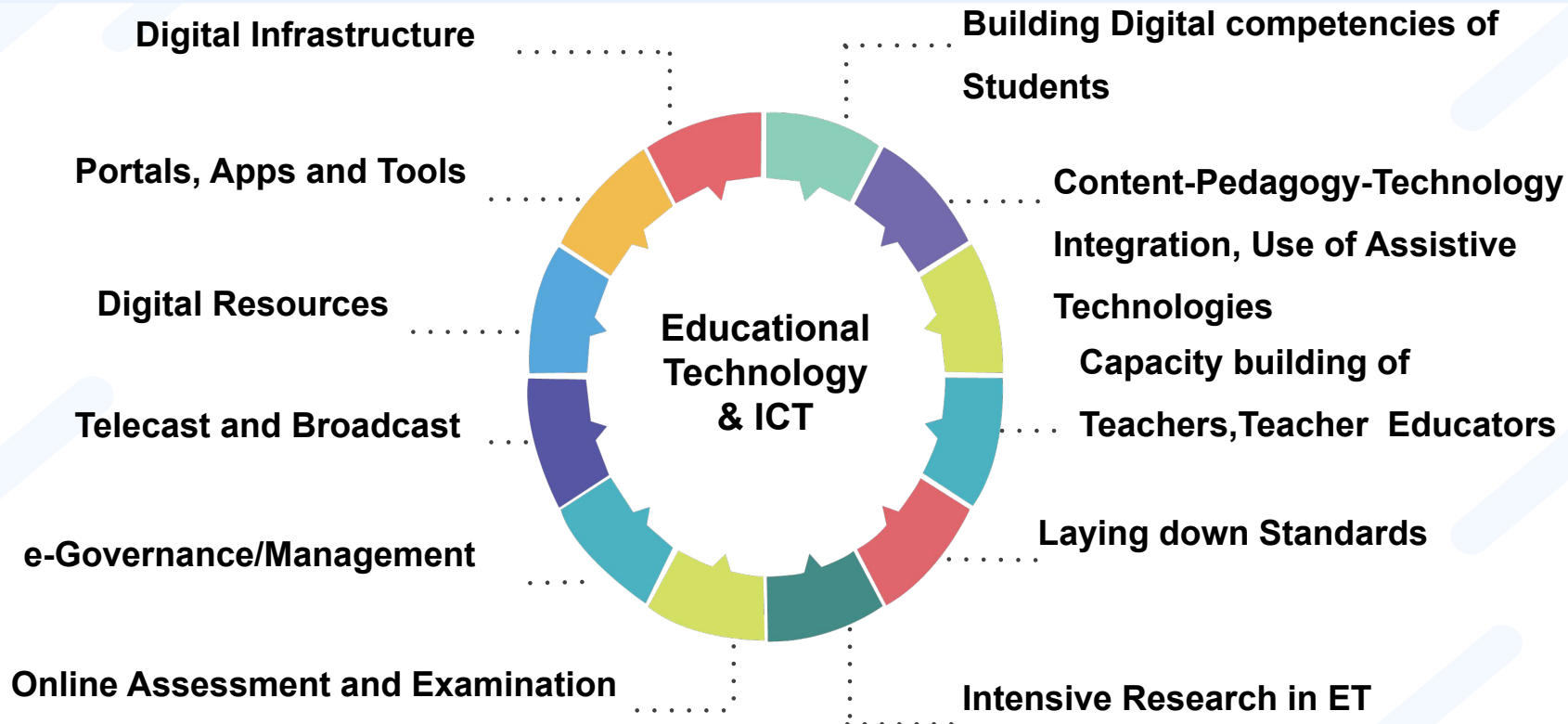


Central Institute of Educational Technology
NCERT, New Delhi

NEP 2020 - Technological thrust areas

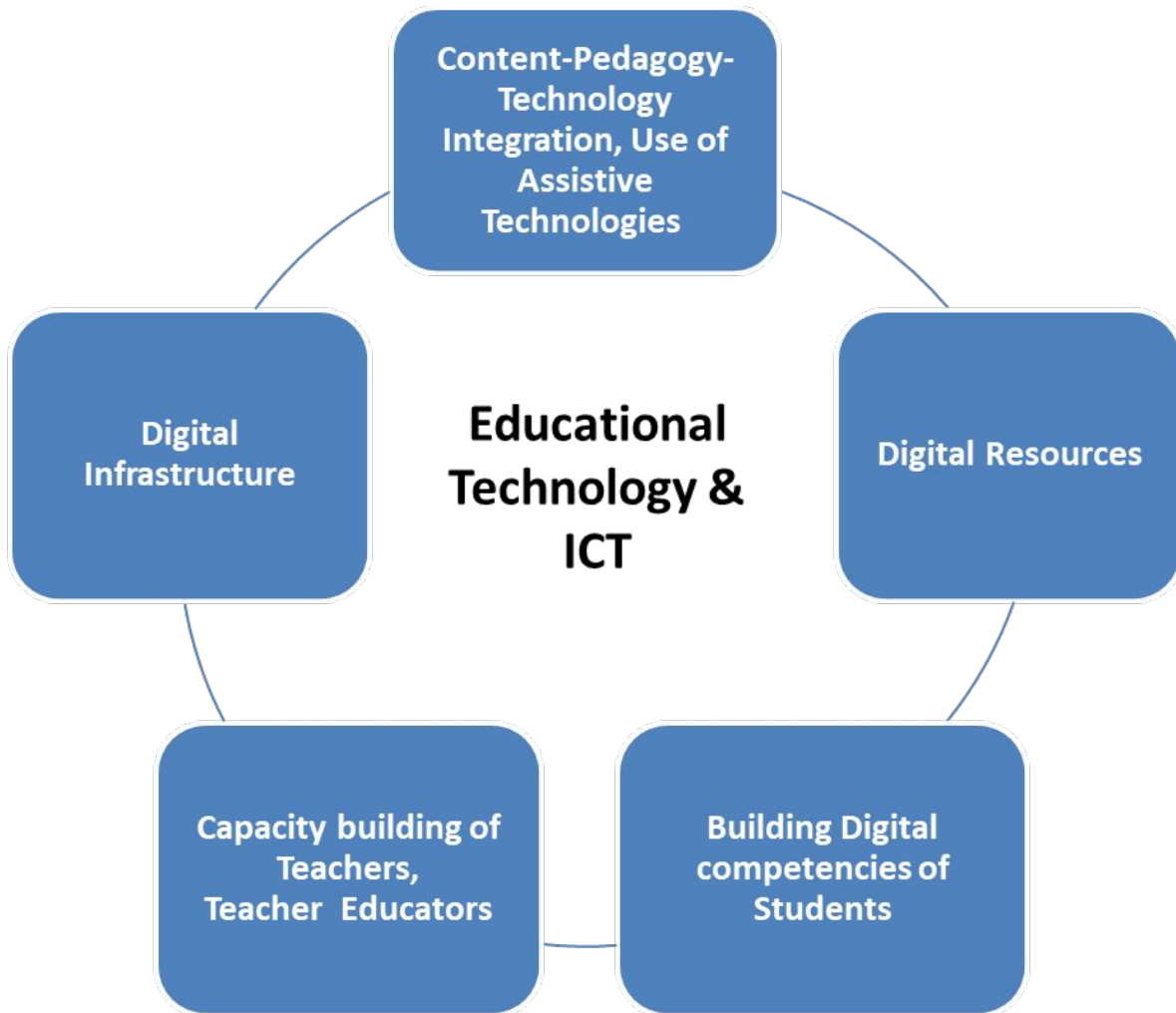


NEP-2020: Recommendations for Online and Digital Education



Policy Perspective (NEP 2020 vision)

- Technology use and Integration
- Ensuring Equitable use of technology
- Extensive Use of technology in teaching and learning
- Content Creation, digital repository and Dissemination
- Blended mode of learning
- Addressing digital divide



Policy Perspective (NEP 2020 Vision) and Virtual Labs



Recommendation of NEP 2020



- Access to quality practical and hands-on experiment-based learning experiences to each student
- Virtual labs enhance actual laboratory experience
- Lab based e-resources help students in visualizing the concepts

Advantages of Virtual labs



- Available on internet for free
- Accessed anytime and anywhere
- Can be accessed even in the absence of physical labs

Virtual labs help learners in following ways

- perform experiments multiple times without consuming chemicals
- revise theoretical concepts
- obtain result of time consuming experiments
- analysis of results thereby improving logical thinking skill



Pedagogical integration of Virtual labs

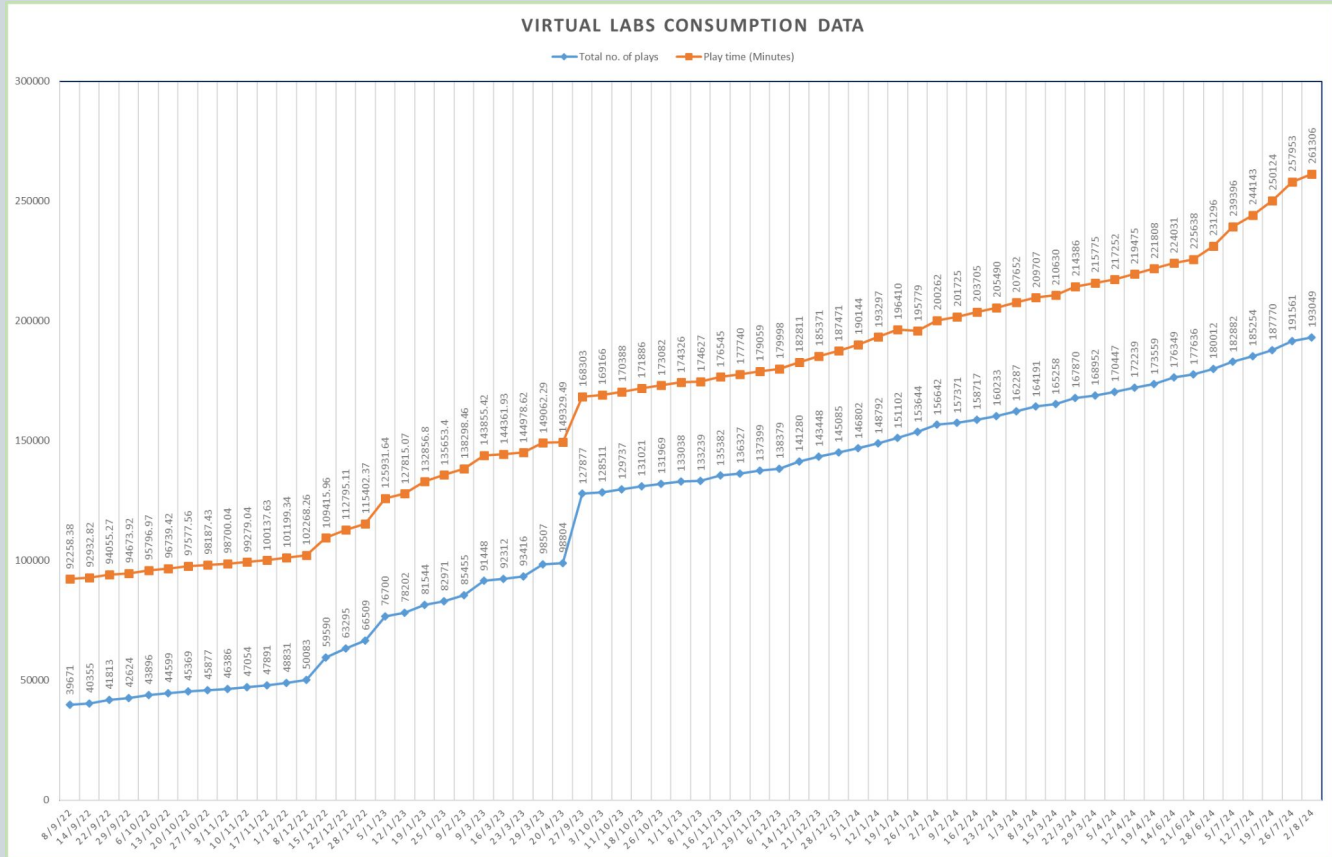
Virtual labs can help **teachers** in following ways:

- Design lesson plan integrating Virtual labs
- Use Virtual labs to demonstrate experimental skills and help learners in developing such skills

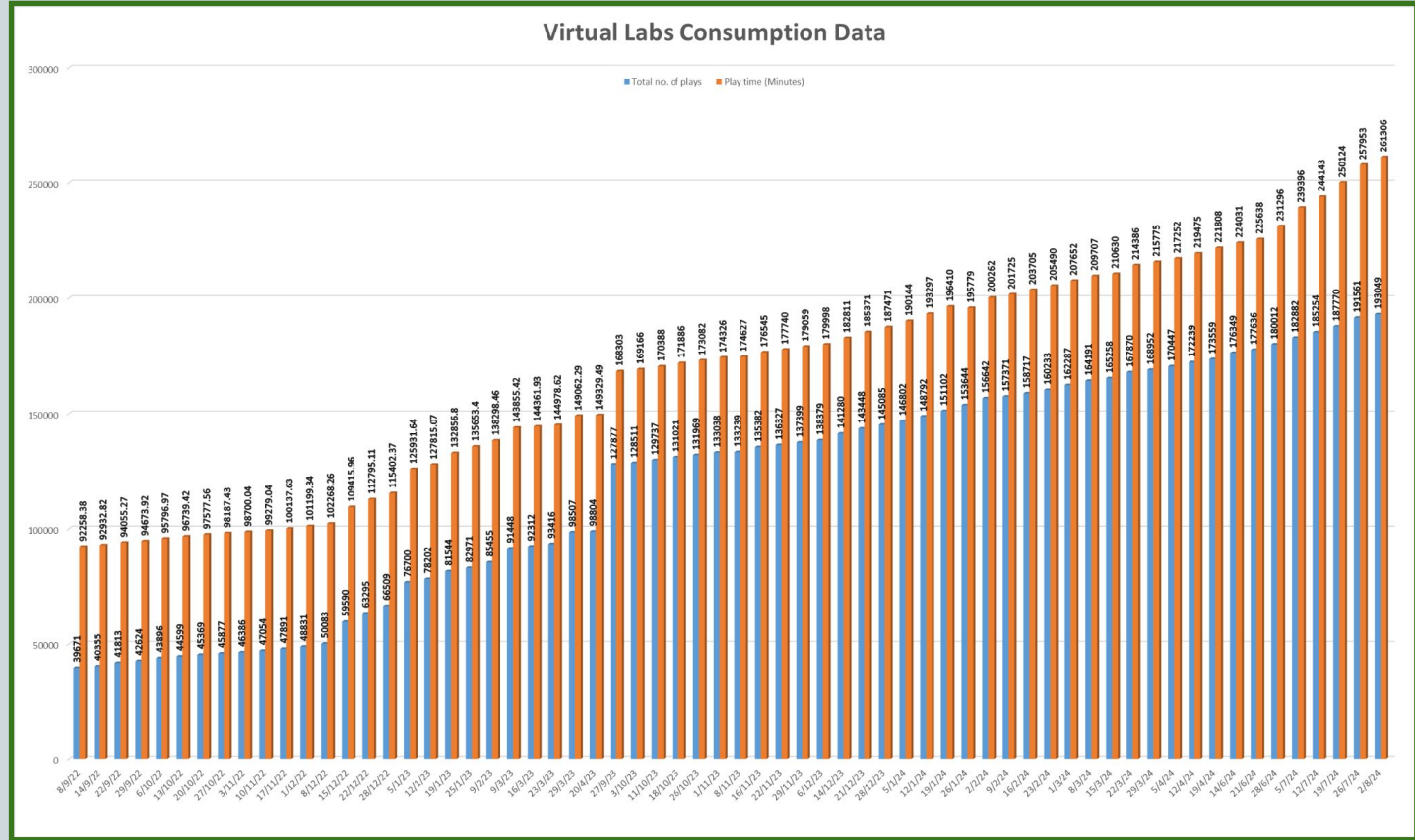


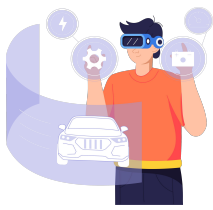
Virtual Labs was launched on 29th July, 2022

Following data shows that large no. of users are taking benefit of available resources



The data shows that large no. of users are taking benefit of available resources

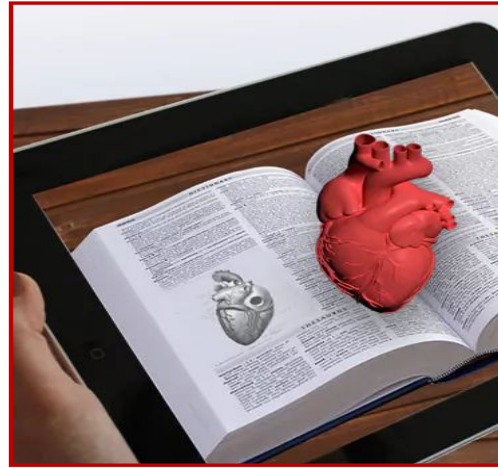




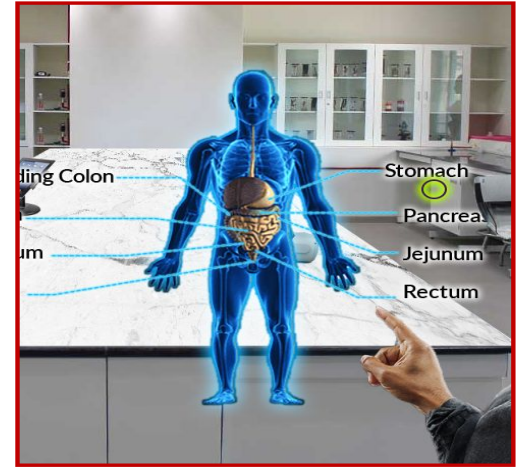
The Spectrum of Reality-Virtuality Continuum



Reality



Augmented Reality



Virtual Reality



Augmented Reality

- **Augmented reality (AR) refers to the real-time integration of digital information into a user's environment.**
- **AR technology overlays content onto the real world, enriching a user's perception of reality rather than replacing it.**

Virtual Reality

- **Virtual Reality (VR) is a simulated experience created by computer technology that immerses users in an interactive, three-dimensional environment.**
- **It allows users to experience and interact with a virtual world as if they were physically present.**

Pedagogical Benefits of Extended Reality

Increased Engagement-

Immersive experiences make learning more exciting and interactive, boosting student motivation and interest.

Improved Retention-

Hands-on experiences in virtual environments lead to deeper understanding and improved knowledge retention.

Personalized Learning-

Students can learn at their own pace and adapt the simulation to their individual needs and learning styles.

Enhanced Collaboration-

Virtual environments facilitate collaborative learning, allowing students to work together and learn from each other.

Steps to reach at desirable resources of Virtual labs

URL: <https://diksha.gov.in/>

- Search <https://diksha.gov.in/>

DIKSHA

Home Dashboard About Get App Contribute User Guide

Explore DIKSHA Login

DIKSHA

ONE NATION ONE DIGITAL PLATFORM

An initiative of the National Council of Educational Research and Training (Ministry of Education, Govt of India)

View DIKSHA world of open digital content

NCERT

CBSE

NIOS

STATE / UT BOARD

Select State

- Scroll banners to find Virtual labs vertical and click on its “Explore” icon.

Focus Areas of DIKSHA

e-Jaadui Pitara



Foundational Stage Content with toys, games, puzzles, puppets, posters, flashcards etc.

[Explore →](#)

Education For All



To impart foundational literacy and numeracy, critical life skills for Citizens

[Explore →](#)

Virtual Lab



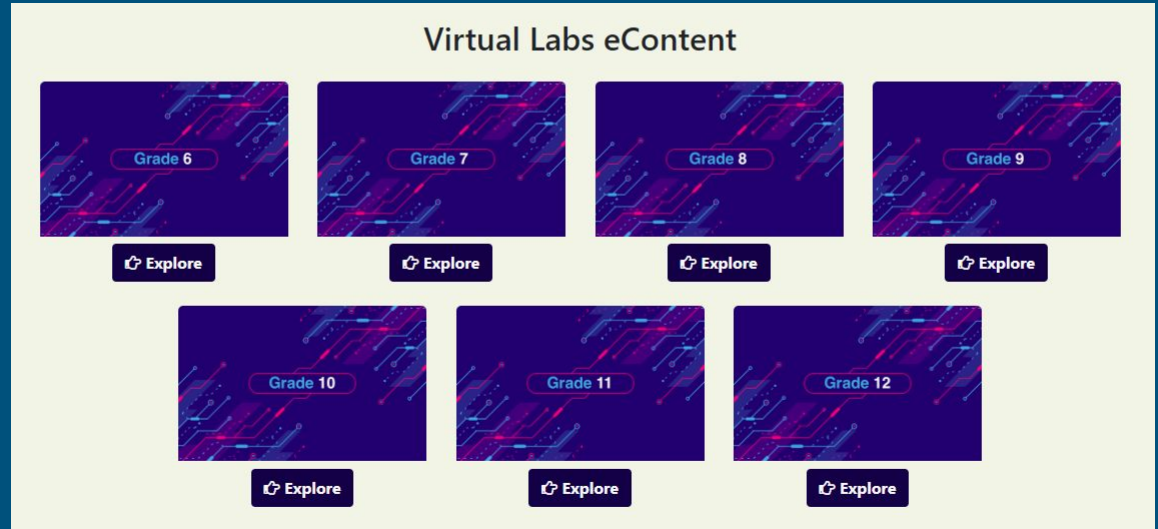
Virtual laboratories access for students to enhance actual laboratory experiences

[Explore →](#)



- Scroll down on the landing page of Virtual labs to reach eContent of classes 6-12.

Virtual Labs eContent



The screenshot displays a grid of seven buttons for different grade levels, arranged in two rows. The top row contains buttons for Grade 6, Grade 7, Grade 8, and Grade 9. The bottom row contains buttons for Grade 10, Grade 11, and Grade 12. Each button features a dark blue background with a glowing circuit pattern and a white 'Explore' button with a magnifying glass icon.

Grade	Explore Button
Grade 6	Explore
Grade 7	Explore
Grade 8	Explore
Grade 9	Explore
Grade 10	Explore
Grade 11	Explore
Grade 12	Explore

- Click on the “Explore” icon of the desirable class, select the medium of interaction, then choose a subject you wish to study.

Virtual Labs eContent

The interface displays a grid of options for Virtual Labs eContent. Each grade level (6-12) is represented by a card with a circuit-themed background. Below each card is an 'Explore' button. Underneath the buttons, users can select the medium of interaction (Hindi or English) and then choose a subject to study.

Grade	Mediums	Subjects
Grade 6	Hindi Medium, English Medium	Mathematics, Science
Grade 7	Hindi Medium, English Medium	Mathematics, Science, English
Grade 8	Hindi Medium, English Medium	Mathematics, Science, English
Grade 9	Hindi Medium, English Medium	Mathematics, Science, English
Grade 10	Hindi Medium, English Medium	Mathematics, Science
Grade 11	Hindi Medium, English Medium	Mathematics, Physics, Chemistry, Biology, Computer Science
Grade 12	Hindi Medium, English Medium	Mathematics, Physics, Chemistry, Biology

- Click on the simulation to perform experiment.

The screenshot shows a digital learning interface for a science activity. At the top, a yellow header contains a back arrow, the text 'Science Activity', 'English', 'Class 7', and a 'Share' button. The main content area is titled 'Stomata in Leaves' and includes a 'SELECT THE LEAF' dropdown menu with 'Leaf of Mango' selected. The central simulation area, labeled 'Mango Leaf', displays a virtual laboratory setup with a mango leaf on a plate, a 'Slide', a 'Coverslip', a 'Water' dropper, and a blue microscope. A 'RESET HELP MAXIMIZE' control bar is positioned above the simulation. Below the simulation, a footer states: 'Developed by Amrita University under research grant from Department Of Electronics & Information Technology'. On the right side, a sidebar menu offers navigation options: 'All', 'Video', 'Interactive', and 'Docs'. Under the 'Resources' section, the 'Learning resource' category is expanded, and the 'Simulation-Stomata in Leaves' item is highlighted with a red rectangular box. Other sidebar options include 'Credits and Licence information'.

Virtual Labs provide self paced
engaging learning experience