EDUCATIONAL TECHNOLOGY AND ICT

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Lecture-51

Module-51: Digital infrastructure and DIKSHA

Hello dear learners, welcome to the SWAYAM-NPTEL course on Educational Technology and ICT. I am your course coordinator, Dr. Sarita Anand, from the Department of Education, Vinaya Bhavana, Visva-Bharati, Santiniketan, West Bengal, India. Today, we will talk about Module 51 on Digital Infrastructure and DIKSHA. This is Lecture 51, and before going into the topic, we will review the concepts covered. Earlier, we had covered computer-aided evaluation, concepts and meaning, the evolution of CAE, computer-aided evaluation, the working mechanism of CAE, basic types and categories of CAE, and a comparison of CAE with other traditional methods of assessment.

Now, we will move on to today's topic: digital infrastructure in educational institutions. We know that in the 21st century, digital infrastructure plays an important role in transforming teaching, learning, and administrative processes in educational institutions. From smart classes in schools to AI-powered research labs in universities, digital infrastructure supports e-learning, blended learning, remote education, and data-driven decision-making.

This document on digital infrastructure focuses on the key components of digital infrastructure and the facilities across different levels of education, highlighting their importance, implementation, challenges, and future trends. So, particularly, we will initially focus on digital infrastructure in schools. At the school level, digital infrastructure focuses mainly on connectivity, interactive learning, and digital assessments to enhance foundational educational experiences, starting with the smart classroom. Our schools require smart classrooms, which include interactive whiteboards. We call them smart boards.

and multimedia projectors and other digital facilities like DIKSHA or e-Pathshala and the second one is computer labs and ICT facilities. Internet enabled computer labs for different type of computer related courses like coding, digital literacy and computational thinking and AI powered topics or the courses and the different types of platforms like by BYJU'S and Khan Academy and the third one is the learning management systems these days when we talk about the digital infrastructure Then without LMS, we cannot move ahead. So, Google classroom Microsoft teams Moodle and other LMS's are there which are having the facility to give the assignments quizzes and the content sharing facilities and the fourth one is connectivity and the network and If we are talking about the digital infrastructure without connectivity and the proper networking system, it is not successful.

So, high speed broadband and the Wi-Fi networks in any school is required to utilize the digital infrastructure and national optical fiber network NOFN expansion for rural schools is going on by the government of India. Cyber security and digital safety are also important issue that if we are having the computers and the internet facility in our schools, then definitely there is requirement of anti-virus softwares like secure firewalls, content filters and anti-cyber bullying policies also are required and the schools and the teachers and the headmasters should have the awareness regarding those things. The next one is the digital infrastructure in higher education institutions. We all are working here those who are working in higher education definitely they need advanced digital infrastructure to support research, teaching, online education and large scale administrative functions related with the digital infrastructure. So what are the key components in colleges and universities?

The first one is advanced smart classroom and lecture halls. In large level of teaching or large classes, definitely we need smart boards having the AI power facilities, video conferencing tools. like Zoom and Webex also lecture halls or seminar halls are required to facilitate these smart boards and other facilities and AR, VR enabled labs or immersive STEM simulations are required in basically in science subjects and the second one is learning management system Earlier we had talked about the LMS in schools, also in higher education LMS and MOOCs are required. These days teachers are placing their course on LMS, different LMSs and the platforms like

So NPTEL, Coursera, edX and Udemy are providing MOOCs courses. And AI driven adaptive learning models to personalize student learning path. Now these days our LMSs are AI enabled and many tasks we are performing with the help of AI. The third one is high performance computing for research. These days not only AI driven research labs or cloud

computing resources are going on for the higher education, but also there is a concept of Param Shivay that is the supercomputer by the government of India.

It is installed in IIT BHU and other IITs are also working on it to provide the digital infrastructure in higher education institution. Then the fourth one is digital libraries and open educational resources. In previous lectures also I had mentioned that these NDLI of Government of India and the other platforms like e-Shodh Sindhu and Shodhganga are also providing digital infrastructure e-contents for the teaching learning, both for the teachers and the students and AI assisted search tools for research and thesis writing. These days every website is having their own AI assistant and if you will go for NDLI or DIKSHA, you will find they are having their own AI assistant.

If you are needed any help, they can assist you. the virtual and remote labs IITs are providing virtual labs in one lecture of mine i have mentioned that IIT Bombay is also utilizing this virtual lab and AI enabled STEM education lab so remote-control robotics and IoT (Internet of Things) labs, etc. are going on in different IITs of the higher education institutions and also the 5G and cloud computing is going on.

We hope in the near future there will be 6G facilities in our institutions, and cloud-based computing, data storage, or online collaboration with the help of Google Drive or OneDrive are ongoing. So, AI and blockchain in student records these days, we are following this blockchain-based digital certification and locker system like Digi Locker, NAD, and the National Academic Depository. Also, I hope those who are studying in higher education, every one of you have your ABC account, and at the time of SWAM registration, you mentioned your details during the course registration. So, cybersecurity and data protection—definitely, we are using data protection with the help of AI-driven detection systems that prevent cyber threats. Also, in educational institutions, they are using biometric attendance and facial recognition for security purposes.

For example, if you go to NCERT, they use biometrics for attendance. Now, the digital infrastructure in Indian education is focusing on NEP 2020 and DIKSHA. Whenever we talk about digital infrastructure, we must have internet and other facilities, and for that, NEP 2020 is giving emphasis on digital infrastructure, and DIKSHA is also enabling this transformation of education through its initiatives. NEP 2020 was envisioned as an inclusive, technology-driven education system that ensures accessibility, quality, and equity. While DIKSHA serves as a dedicated platform to provide digital content, teacher training, and student learning resources. Together, these two initiatives, the NEP 2020

policy and the DIKSHA initiative are two steps toward realizing a digitally empowered education ecosystem in India. So, first, we will see what NEP 2020 says about digital transformation in education. If we go through NEP 2020, we will see that this document, this policy, emphasizes integrating digital tools and infrastructure in teaching, learning, and assessment.

It recognizes the role of technology in modern education. Now, NEP 2020 proposes the establishment of the National Educational Technology Forum, which has already been established and is running at present. It serves as a platform to exchange ideas and best practices on the use of technology in education. Through this initiative, educators, policymakers, and stakeholders are encouraged not only to elaborate but also to advance digital pedagogy in practice.

So, another significant development under NEP 2020 is promoting digital assessment and AI-driven evaluation methods by using the technology, policy aims to move away from the traditional road-based examination and encourage the competency-based learning assessment. This is evident in the growing adoption of computer-based testing by competitive examinations such as JEE, NEET and CUET and also, I had mentioned in CAE when I had discussed in previous lecture computer-aided instruction that these days these examinations are utilizing the computer-based testing which ensures the transparency, efficiency and reduced logistic cost.

So, the digitization of assessment method also extends the automated grading system, which are being piloted essay evaluations and school level examination. So, these are not only easy to conduct, but also it is saving the time and NEP 2020 also focused on the improving teacher training through digital means acknowledging that well-trained educators are essential for effective technology integration in classrooms and the teachers are now being trained through online professional development program which I have also discussed in the CPD (Continuous Professional Development) and professional development through different national institutions, state level institutions like HRDCs, MMTTC, etc. and this will equip the teachers to ICT skills and enable them to design and deliver the engaging digital lessons in their classes.

For that, I had also mentioned NISHTHA. This NISHTHA was mean to give the training to the different levels of the teachers, especially the school teachers and which is integrated into the Diksha platform, which provides the teachers with interactive courses, self-paced learning materials and teachers can get the certification after the completion of that NISHTHA.

Now, when we are talking about digital infrastructure and we cannot complete it without talking about the DIKSHA. This DIKSHA is the initiative, actually digital initiative by the government of India and the full form of this DIKSHA is digital infrastructure for knowledge sharing and its motto is one nation, one digital platform. It's a national platform where school education is going on and it is devoted to the school education initiative of Government of India, NCRET under the Ministry of Education and launched on 2017 by the Honorable Vice President of India Sri Venkaiah Naidu ji. And now adopted by all the states and Indian territories and also the different boards like CBSE etc. Now the vision and the mission of DIKSHA.

This DIKSHA is having the mission to create the revolutionary learning ecosystem that empowers students to thrive in 21st century and they believe that education should be accessible, engaging and tailored to the individual need. of each learner and whatever I have mentioned here this is you can get it from the DIKSHA website also. So, there is no issue of plagiarism because I had taken it as it is it mentioned in the DIKSHA platform and the vision of DIKSHA is to transform the way of education is delivered by leveraging the technology and innovation and they aim to provide students with a holistic learning experience that goes beyond traditional classrooms. Through this platform, they can equip with the students to the skill of their need and not only academic success for the personal growth and development of the learners.

So, if we go to the DIKSHA, we will go for the website visit. If we will go to the DIKSHA, you will see when you open the page, you will find DIKSHA is not only mean for the student. DIKSHA is mean for the students, teachers, parents and other officials and those who are head teachers, they can be benefited with the help of this platform DIKSHA. So, initially they are mentioning that Disha was initially designed as a platform for teachers to access the training resources, lesson plans and digital learning materials and over the time it has evolved into a comprehensive digital repository catering to the student educators and administrators alike.

The mission was started focusing on the teachers, their training, but after time gone through, they developed themselves and they decided to work upon the all stakeholders of the educational system, particularly in school level, so that everyone can be benefited with this platform of DIKSHA. Now the next step you will find that there is the art learning ecosystem for users. If you want to go through this component, you will find there are many things available, many facilities are available for you all. And we will find out the

DIKSHA dashboard and it will provide the information that how many users are there, how many people have benefited, how many learning sessions are gone through.

So, when we visit the website, we will see all these things, and you will find that the use of the DIKSHA platform is on a large scale, and lakhs of people are benefiting from this DIKSHA platform. Now, the features of DIKSHA, before going to the website, we should see what the features are. One of the major features is that they provide textbooks, especially CBSE textbooks, with QR codes in those school books, allowing students to scan the code and access digital content, explanations, and interactive exercises related to their syllabus. So, this provision of QR codes is making digital infrastructure hand-in-hand, and the student, the learner, can access it anytime, anywhere. This feature has significantly enhanced self-paced learning, as students can revisit complex concepts with the help of videos, animations, and quizzes available on the platform. The initiative is particularly beneficial for students in rural and underprivileged areas where access to physical educational resources may be limited. So, this is fulfilling the motto or the goal of equal opportunity. In addition to student learning, DIKSHA has been instrumental in teacher professional development.

The platform hosts various certification courses and training modules designed to improve pedagogical skills and technological proficiency. During the discussion about CIET, I had mentioned these things. Teachers can take advantage of self-paced courses on digital teaching methods, classroom management techniques, and subject-specific training programs also organized by DIKSHA. The success of DIKSHA in empowering teachers has been evident in the massive number of enrollments in the NISHTHA training program, where millions of teachers across India have received their digital certification.

Now, the most prominent feature of DIKSHA is its multilingual nature, as it is a platform available in multiple languages. Over 22 Indian languages are supported, making it inclusive and accessible to a diverse group of learners. This means that students from different language groups can benefit from DIKSHA. This multilingual support is crucial for ensuring that students and teachers from different linguistic backgrounds can access digital education resources without language barriers. We have seen that due to language barriers, many people do not follow online courses or training programs because they are available only in English, and they struggle to understand English well.

Instead, they prefer content in their own languages. That is why this platform is successful for all stakeholders, especially students and teachers from diverse language groups. The

platform's mobile-friendly interface allows users to download content and study offline, which is particularly useful for regions with limited internet connectivity. DIKSHA also has its own app, so if you are interested in using DIKSHA for yourself, your kids, your students, your neighbors, or your relatives, you should download the DIKSHA app on your mobile and access the available resources for your study purposes.

In terms of assessment, DIKSHA has also introduced automated quizzes, tests, and assignments. These tools provide instant feedback to students and help teachers track their learning progress more effectively. Schools have started incorporating DIKSHA-based assessments into their learning modules, making formative evaluation a seamless part of the educational process. So, when we talk about the facilities and benefits of DIKSHA, there are also some limitations, such as the availability of digital infrastructure in schools, like smart classrooms or computers, as well as mobile or internet access. However, challenges like the digital divide persist. I repeat, the digital divide is a major hurdle in providing equal opportunities to teachers and students, as envisioned by NEP 2020. This vision cannot be fulfilled if the necessary infrastructure is not available in schools or colleges.

Economically disadvantaged background struggle to access online resources due to lack of internet connectivity, digital devices and electricity. We have seen those cases at the time of COVID period and while the government has made efforts to distribute tablets and set up internet KIOSK in rural areas, a large section of students still faces barriers in assessing the digital education. Another challenge is teacher readiness and digital literacy problem. The teachers are not ready.

They are not well trained and they are lacking digital literacy problem. They are not well aware. So, many teachers especially in government and rural schools are not yet comfortable using e-learning tools and e-assessment and digital teaching methods. So, there is need for ongoing digital training programs and on ground support is crucial for the successful implementation of these kinds of initiatives. So, cyber security and data privacy concerns definitely this is also a key issue for the digital platforms because they are increasing need of a strong data protection policy, cyber security measures are required because our sensitive information’s are available or kept on these platforms when we are signing in.

So, rising dependence on the cloud computing and technology driven education ensuring the security of the students and the examination data and it should be the top priority for

the administrators and the facility providers. So, what could be the future of digital education in India and when we are talking about the future of education in India, especially in digital education in India, definitely that future is bright because government is taking so much initiatives to provide these facilities. These days, National Optical Fiber Network is going on and 5G networking is available maybe in future 6G technology will come and this will fill up the barriers the gap of internet in between the rural and urban areas and schools will be able to adapt a smart classroom, hybrid learning models and maybe real-time interactive digital resources making quality education accessible to all, now we will go through the DIKSHA. Now we will go through the website and we will visit the DIKSHA website and here we go on the DIKSHA platform.

If you all are interested, you should definitely go and sign in to the DIKSHA platform and you will find that all kind of information is available very well and you will be aware regarding not only for yourself for the your students and your known people like you can see that a comprehensive learning for foundational to secondary level and it is showing the date and these are the metrics you can see that daily active users of diksha are 1.29 lakhs and registered users are 1.77 crores. So, learning sessions are there and they have given their matrix in the crores and the content matrix is energized text books 7467 and e-contents are available 3.70 lakhs and the course matrix is 21,713 courses and more than 18 crore enrollments and for more than 14 crores almost 15 crores completion.

So, this initiative is working well and this is the DIKSHA app I hope you as a teacher or the learner of the education should have the app in your pocket and whenever you want to use it, you can go through it. You can see here the NCRET, CBSE, NIOS which are providing their content on this platform. So, if we will go through the dashboard, we can see that what information they are providing Okay, this screenshot I had mentioned and they are providing the state-wise development user matrix which is state is using this app or the website.

The first one is the 15 lakhs, I think this is UP and Delhi region and other states are also using the usage matrix they are providing. The whole information is there and we can go through it. They have provided in the state-wide or language-wise. This is the language wise, content matrix, e-content, the English contents are in the large number, then Hindi, then Kannada and Urdu, I think Urdu, then Kannada and then Gujarati and Marathi. So, you will find that there are lots more works they are going. The books are available from grade wise preschool to 12th class. You can see here and the 11th and 12th class books are

in large number because NIOS is also working regarding this and they are having the contribution in this list. Then comes the language version.

Arogya-v-Sharirik Shikshan and this is one book accountancy they have large number of books and there so on so you can go through it and benefited by this and if you are a student or a teacher or the parent or the school head or administrator it means you can sign in with your login with your identity and they will provide the facilities accordingly Then comes the about, we should see. Yes, I have shown that I had taken that information from this page, which I have already shown you that how they are working, what provision they are giving, like they are having their own chatbot.

I forgot the name that will show on the platform when we will use the app. Energize textbook, teacher professional development, question bank, content sourcing, content authoring, quizzes, content consumption, data tool and dashboard, chatbot, digital credentials like ABC account, collaboration and other facilities are there. Especially the contents are very important for us. and they are providing different guideline and book in the form of PDF; this is available here in this platform. So, this is the comprehensive platform which is working since 2017 and day by day they are updating their self.

So, if you are interested to contribute, they are also giving this provision of VidyaDaan. Many of our B.Ed and M.Ed students were enrolled; many teachers are enrolled here. If you are interested, you can go through it, there will be registration process and you have to fill it and you can contribute in nation building through your VidyaDaan. so what kind of resource you want to contribute like explanation video practice questions teaching videos experiential learning videos and lesson plans so there are some rules and regulation terms and policies you have to go through it and if you will be eligible you will have to pass some kind of interview one, two, three students are of mine had passed this and they are contributing on this DIKSHA platform in the provision of VidyaDaan.

So, I think *Raktdaan is Mahadaan,* so *VidyaDaan is also Mahadaan.* So, we can contribute and there is a very easy user guideline that how you can go through the app and how you can share the content how can utilize the provided books or the other content so these are the guidelines I hope you will go through it and you will get benefited not only for this course purpose but also for your understanding and your knowledge and awareness regarding the digital initiatives by government of India because they are expanding so much money on the platforms like this and we have to we should get the benefit of these provisions so let's go through the presentation again we will return back to our presentation

and i think i was here next we will go for the conclusion of the today's topic So, we can conclude that the digital transformation of educational institutions from schools to universities is redefining the learning experiences.

While significant progress has been made, DIKSHA have advanced digital education and this provision in India by making high quality learning resources accessible to all and improving the teacher training, enabling e-assessments also. And however, these are the initiatives of the government to reach the full potential of the performance of the students and the teachers, there is need of continuous policy support. investment in infrastructure and enhance digital literacy among the educators and students. and awareness should be also increased.

The future holds exciting possibilities for digital learning, and with sustainable efforts, India is going to be a well-performing nation on the path to becoming a global leader in technology-enabled education systems with quality education for all. So, these were the key points for today's lecture. I have given a few references for your further studies. I hope you will go through them.

Keep learning. Thank you.