

Technology in Education: NDEAR

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Rapporteur: Dr. Rejaul Barbhuiya, Associate Professor, CIET, NCERT

Introduction

The NEP 2020 stresses that new circumstances and realities require new initiatives. The recent rise in epidemics and pandemics necessitates that we are ready with alternative modes of quality education whenever and wherever traditional and in-person modes of education are not possible. In this regard, the NEP 2020 recognizes the importance of leveraging the advantages of technology while acknowledging its potential risks and dangers. The National Digital Education Architecture (NDEAR) has the vision to create a “Unifying national digital infrastructure to energise and catalyse the education ecosystem”. Essentially, this is a technological framework that aims to enable existing systems to upgrade and become interoperable, while making available, the building blocks for the creation of new tools and solutions. As part of the Shikshak Parv programme the webinar on “*Technology in Education: NDEAR*” was organized 8 September 2021.

Session Highlights

Sh. Santosh Kumar Sarangi, Additional Secretary, Department of School Education and Literacy began the webinar by welcoming all the teachers, principals, students, academicians and parents viewing the live webcast. He invited Ms. Anita Karwal, Secretary, Department of School Education and Literacy to give brief introductory remarks. She welcomed all participants and wished everyone a Happy International Literacy Day. She informed the audience that 8th of September was declared by UNESCO as International Literacy Day by to remind the international community of the importance of literacy for individuals, communities and societies, and the need for intensified efforts towards more literate societies. Furthermore, the National Institute of Open Schooling (NIOS) has been selected as one of the winners of the prestigious UNESCO King Sejong Literacy Prize 2021 for the programme ‘Enabling education of persons with disabilities through the technology-enabled inclusive learning material, with a focus on Indian Sign Language (ISL) based content’.

The Secretary then emphasized that people in general relate literacy with adults only. However, literacy could mean foundational literacy, digital literacy, financial literacy etc. Digital literacy is a necessity today. It is incumbent for good quality of life and ease of living, which in turn is the mark of national progress. Therefore, our aim should be to achieve digital literacy for 100% of citizens. Ms. Karwal remarked that the webinar on National Digital Education Architecture (NDEAR) is purposefully scheduled on this date as it has strong linkage with achieving the goal of digital literacy. She concluded by reiterating that Hon'ble PM's comment during his inaugural address that "NDEAR is the UPI (Unified Payments Interface) of education."

During his introductory remarks, Sh. Rajendra Sethi, Deputy Director General, NIC gave a brief background about NDEAR. He said that NDEAR is related to narrowing the digital divide and moving towards digital literacy. NEP 2020 envisions creating an equitable and vibrant knowledge society by providing high quality education to all. He stated that we have witnessed large scale disruption in school curriculum due to the pandemic. This has led to the adoption of innovative practices for teaching-learning. He reiterated that the theme for this year's Shikshak Parv is "Quality and Sustainable Schools – Learning from Schools in India". The purpose of this theme of the Parv is to share learnings from the schools pertaining to quality inclusive practices and sustainability. He highlighted that the webinar's focus is to discuss the technology in education: NDEAR perspective in school education.

Sh. Rajnish Kumar, Director (Digital Education), Ministry of Education gave a detailed presentation on National Digital Architecture (NDEAR). He began by explaining that NDEAR comes with a vision to create a "unifying national digital infrastructure to energise and catalyse the education ecosystem". The NEP 2020 mentions that "the core idea of NDEAR is to facilitate achieving the goals laid down by National Education Policy 2020, through a digital infrastructure for innovations in the education ecosystem, ensuring autonomy and participation of all the relevant stakeholders." He stated that NDEAR will pave the way to achieve learning outcomes by offering solutions to learners and teachers. Digital ecosystem of education needs to take a long-term view of aspects like interoperability, data governance, data quality, data standards, security and privacy, besides promoting open innovation.

Sh. Kumar then discussed how NDEAR is not a platform, portal or a software application. It is an architectural blueprint for the education ecosystem, which defines the principles, policies, standards, specifications and guidelines for development of technology driven solutions for different areas of education ecosystem that includes technology, data, inclusiveness, openness. He explained that an initial set of 36 building blocks across 12 categories have been identified under NDEAR to kickstart the digital infrastructure for education. The key guiding principles of NDEAR are federated architecture (decentralized), inclusivity, ecosystem approach(engagement of all stakeholders), privacy & security by design, interoperable (seamless portability) and longitudinalrecords (records documented over time).

Sh. Kumar highlighted the envisioned outcomes of NDEAR for all stakeholders involved. Firstly, the students get access to on demand learning materials, videos, graphics and animations, virtual lab and different forms of assessment tools. This will lead to personalized adaptive learning (PAL). Secondly, the teachers get access to online support for lesson plans, use of TLM, pedagogic transactions, online reference materials, competency-based evaluation tools etc. Thirdly, schools get access to school management practices, school related ERPs, learning management systems, data analytics etc. Fourthly, parents get access to the child's holistic progress report, schools' performance and teachers' performance. Community also plays a role in voluntary engagement, Corporate Social Responsibility and mentorship. Lastly, educational administrators use data analytics to bridge infrastructure gap, teacher availability, address dropouts and make informed policy choices. He ended his presentation by saying that if we have an orchestra, where everyone in the system works in tandem to a symphony, then we can have an excellent infrastructure.

This was followed by presentations by three school teachers about their journey in adoption of technology in education. Dr. Sanjay Kumar from Himachal Pradesh shared his experience in use of technology in primary schools. He discussed about the *Har Ghar Pathshala* initiative. It is a WhatsApp based initiative where the State Project office (Samagra Shiksha) disseminates the e-content to children through BRCs and further by teachers. At present, it is facilitating 8 lakh students online. He explained the various challenges he faced during the Covid-19 lockdown with regards to content creation, dissemination, facilitation, mentoring, assessment and feedback.

From being a novice, he started developing interest in learning technologies which helped him learn tools for creation of presentation, video recording, editing, and their dissemination through WhatsApp and YouTube.

Dr. Kumar then started connecting with learners through Google Meet and guided parents on how they help their children learn better. He conducts daily subject wise classes for students. For fellow teachers, he has organized webinar for their well-being as well as to motivate them to learn technology. He regularly uses WhatsApp for sending homework, activities and receiving their responses and problems. Now, his students are also confident of using different tools and they are friendly with camera and creating their own videos. He also uses ICT tools for assessment of learning both formative and summative. In a nutshell, Dr. Kumar could successfully overcome all the challenges – be it the issue of connecting with the learners, developing engaging e-content, adoption of ICT for holistic assessment of learning, motivating fellow teachers on use of technology, and gaining confidence of parents as well as community for bringing out significant change in the overall approach of use of technology in teaching-learning-assessment involving all the stakeholders.

The second speaker, Ms. Pratima Singh shared her unique and encouraging journey of adoption of ICT in the Primary School Dhusah and the Balrampur community. The Covid-19 pandemic forced closure of schools and teachers had to quickly adapt to the new pedagogy of digital world. She started by using VC tools like Zoom, Google Meet, Teams and gradually learned many other tools. The exclusive WhatsApp group for primary schools is being used for dissemination of content among students and teachers. She highlighted the usage of DIKSHA in Uttar Pradesh which is an indicator of overall consumption of e-resources during the pandemic. She also used Google form to conduct an online survey among 500 teachers about use of technology during the pandemic. In collaboration with other National ICT Awardee teachers, she organized online webinars on ICT tools for teachers from aspiring districts. This had huge response from teachers and there was certification based on quizzes conducted on the webinar topics. At the end, she discussed how the building blocks of NDEAR can further help in evolving Indian education system. She talked about her expectation from NDEAR and how students, teachers, parents and

community can take benefit of NDEAR for furthering their agenda of improving outcomes of learners.

Mr. Simon Peter Paul started by sharing his experience of ICT integration in classroom in Puducherry. He highlighted the significant shift in adoption of technology by teachers - before pandemic and during pandemic. During pandemic, teachers could reach students only via technology, which forced them for more adoption of technology. He explained how he used technology to enhance the reading skills of students. For this, he created videos, stop-motion animations and interactive eBooks. He converted poems as songs which generated further interest among learners. He played short videos of his students learning through these initiatives.

Mr. Paul then elaborated on how he conducted online classes during the pandemic. He and his fellow teachers focussed on teaching students enrolled in the local government schools. After the initial selection process and setting up of online classes, he received a good response from his students. Students submitted their homework through WhatsApp. Besides YouTube, he also telecasted videos through local channels as well. The videos were also shared through OTG Pen drive. All these were done with the aim to reach learners having different gadgets. He emphasized that NDEAR would facilitate online education and help teachers and students. Teachers would be able to access learners' profiles easily and send interactive videos, activities etc. to specific students who may be weaker in certain concepts. All the educational resources are integrated in NDEAR and it works offline as well. Students will be able to transfer certificates and documents in digital format.

Question and Answer Session

Sh. Santosh Kumar Sarangi, Additional Secretary, Department of School Education and Literacy complimented all the speakers on the stellar work they have been doing in their respective states. He asked Mr. S. Simon Peter Paul how he identified at different software for editing, enhancing the teaching experience and digital learning. He also asked Mr. Simon how he trained teachers on these tools. Mr. Simon in his reply made a mention about the Universal Teachers Academy, which conducts face-to-face teacher training. However, during the pandemic, they are conducting teacher training online. Teachers were given hands-on experience about content

creation, video editing and use of other ICT tools. They also invite resource persons for online classes and training is now being conducted in six languages.

Sh. Sarangi then asked Dr. Sanjay Kumar whether he faced any connectivity issue in the remote areas and what is the proportion of children having gadgets and those without any gadgets. Dr. Kumar responded that they faced many challenges in the beginning. Many students were using WhatsApp in their parents' phones with very small screens. To tackle this problem, he started clustering. A drive was also initiated to collect donated mobile phones. The issue of connectivity is not continuous, but there are times when, there is no connectivity at all. For this, he had to adjust his communication approach and adapt the pedagogy with learners. For instance, due to connectivity troubles, his voice would reach the students at different times during an online class. So now he waits till he has a positive response from each student, before starting the next topic. The other challenge he highlighted is to make young learners sit in front of a mobile screen. He stated that with the cooperation of parents and community, he has been able to tackle these challenges by innovating new ideas.

Sh. Rajnish Kumar, Director (Digital Education) asked Ms. Pratima Singh whether the learning loss during the pandemic could be managed through online mode in Uttar Pradesh. Ms. Singh responded that e-pathshala has helped significantly in the dissemination of video lessons and monitoring their usage by teachers as well as students. While, teachers faced difficulty at the beginning, a blended approach has helped them to become comfortable with technology. Parents were given handholding and support in realizing the benefit of use of technology for education. The Mission Prerna website is also being used to disseminate e-content. This portal also has detailed records of teachers, students and their learning.

Concluding Remarks

Ms. Anita Karwal in her concluding remarks congratulated the three teachers for their excellent journey with ICT which will boost the confidence of teachers at large to integrate technology in their teaching-learning process. She remarked that the webinar was a thriller unfolding before her eyes and she hoped that there will be enhanced participation by teachers in embracing technology. She praised the speakers' efforts in enabling digital literacy not only among learners,

but also among teachers, parents, and neighbouring community at large. She thanked all the viewers and participants.