Trends in Digital Education – A Status Report

WhatsApp, Facebook, Twitter, Instagram etc. have emerged as the new neighbours of the new Digital world. We are always keen to find out the Status- not one is awake or asleep, but whether one is offline or online.

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"India is a global leader in ICT. Education plays a crucial role in this Digital India transformation".

National Policy on Education 2020, Paras: 23.1
(Clause 23. Technology Use and Integration)

1. Landscape Of Indian Education Digital Initiatives

The Google for Education Report (2019) on the *Future of the Classrooms* has reported that people under the age 18 constitute one third of the internet users globally. The Union Budget 2022 has proposed new Digital Initiatives like the establishment of a **Digital University** and Digital Public Infrastructure (DPI). The Digital eco-system is expected to provide economic opportunities for a big amount of Rs.35 Lakh Crore in 2030. India's future will be shaped by the level of participation of the Youth of India who should tap the digital potentials of a developing economy. Keeping this need in mind, the National Digital Education Architecture **(NDEAR)** was launched on 29th July 2021 for a target group of 25 Crore School students, 94 lakh teachers, teacher trainers, education experts, community volunteers, parents, and Administrators. NDEAR will provide the needed energy for the eco system of education. It will guide to build, use and re-use digital technology in Education.

PM eVidya intends to reduce digital divide through digital inclusion through DIKSHA for school education in states/UTs: One Nation, One Digital Platform; About 1.9 lakhs resources have been developed in 32 Indian languages and uploaded on DIKSHA. DIKSHA has seen 5 Crores page hits on an average per day since October 2020. **DIKSHA** started out as a Teacher Professional Development platform in 2017, but looking to the need of the hour, it quickly evolved into a teaching-learning repository of engaging e-content. The pandemic became an opportunity for DIKSHA to expand like

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never before and transform itself into the one nation, one digital education platform that it is today. Under the **Atma Nirbhar Bharat initiative** PM E-Vidya, the DIKSHA platform is providing access anytime anywhere to learning resources. These resources have been mostly developed by NCERT and SCERTs with the help of their teachers. Each of the 35 states/UTs that have on boarded on DIKSHA has their own vertical or share a vertical with the state whose curriculum and Board of Secondary Exams they follow. While NCERT creates e-content in Hindi and English, each of the states/UTs has created E-Content in their own medium of instruction/local languages. E-content is available as textbooks, audios, videos, item banks, teacher training modules, lesson plans, Learning Outcomes mapped to content, teacher handbooks, etc. Launched in 2009, the National Mission on Education through ICT (**NMEICT**) extends an opportunity for all the teachers to benefit every student through collective wisdom. According to the National Knowledge Commission (NKC), Teachers are the nucleus of any educational system. Norms and Standards for teacher education institutions have been revised in 2014 as per the observation of the Justice Verma Commission. Digital India campaign resulted in the introduction of Information Technology to empower the Teacher Education Institutions. SWAYAM has enabled India to have its online interactive learning platform through MOOCs.

In this Digital Backdrop, the National Policy on Education - 2020 has dwelt on length, putting stress on the following digital activities:

1. Professional Development to equip the Teachers as Competent Educators and Pedagogies

2. Integration of ICT/Technology with Pedagogy

3. An Interactive and Certified Assessment

4. A blended approach that combines online and hands-on learning

5. Create virtual labs using current platforms

6. It will be possible to get educational programmes in a lot of different languages at any time, any day of the week, for free

7. The cost-effectiveness of computing equipment in bridging the digital divide

8. Current digital platforms and ICT-based activities

9. Supportive tools for tracking the success of a diverse group of students, made available.

10. A public digital infrastructure that is open and interoperable will be built.

11. A two-way audio and video interface for online classes

12. ICT in Education Curricula for the School System - An introductory programme for the teachers to the educational possibilities of technology. The course was tested in four DMS-RIEs and the State of Karnataka.

NROER REPOSITORY

For many stakeholders in school education, the repository hosts a selection of ebooks and e-Content in multiple Indian languages. It's a collaborative platform that brings together anyone interested in teacher education and schooling.

ePathshala.gov.in

People can access the NCERT e-books and e-Content in many Indian languages through a portal and a set of mobile apps at any time. The platform solves the two problems of reaching different groups of people and overcoming the digital divide at the same time.

Digital Initiatives During Covid-19

The following Digital Initiatives were taken by the Central Institute of Educational Technology, National Council for Educational Research and Training:

1. Twelve DTH TV channels broadcasting the Educational Programmes
2. 88 radio stations participated in the broadcast
3. Live Interaction on NCERT's Alternative Academic Calendar
4. Teachers' Webinar on ICT in Education
5. Speak with the Voice Assistant
6. IVRS-based Manodarpan
7. Counseling Services from SAHYOG DTH TV
8. Online Conferences
9. A Quiz on the Constitution
10. The NEP Quiz on the Internet
11. Yoga Test
12. Educators' NEP Communication Materials
13. Take the Gandhi Quiz to learn more about him.
14. Photography on the Internet
15. Competition
16. Competition for School Students to Write Essays

17. Safer Internet Day Quiz
18. Information and Communication Technology Awards
19. All India Children's Educational Audio Video Festival (AICEAVF) and ICT Mela
20. A National Initiative for the Holistic Advancement of School Principals and Teachers (NISHTHA) - A capacity-building initiative that uses integrated teacher training to improve the quality of school education. NISHTHA strives to develop skills in all school teachers and administrators by focusing on main areas such as classroom process improvement strategies, generic concerns, subject-specific pedagogies, and systemic concerns. There are 18 courses in 10 Indian languages available through NISHTHA online on DIKSHA, with over 24 lakh participants from 34 states/UTs and 7 autonomous organizations. These 18 courses have the following titles:

   1. Education for All
   2. The EVS Pedagogy
   3. Personal Development
   4. Pedagogy in mathematics
   5. Gender Equality
   6. Language Pedagogy is number six
   7. Art-Involved Learning
   8. Pedagogy in Science
   9. Evaluation at school
   10. Pedagogy in the Social Sciences
   11. Health and well-being are numbers 11 and 12 on the list
   12. Leadership in the Schools
   13. School Education Initiatives
   14. Early Childhood Education
   15. Use of ICT in Teaching and Learning
   16. Vocational training
   17. Taking Up the Challenges of COVID-19
   18. POCSO and CSA

2.   Global And National Digital Trends

The current trend in Education is awash with statistics on the impact of the web on 21st Century learning at the National and International levels. Teachers today are

challenged to face a new student generation (born between 1990-2000), called Net Generation who learns and communicates differently, relying on Internet as a feature of everyday life and who are always connected as 'digital natives' (Jones and Fox,2009 The Pew Report). *The Status is not one is awake or asleep, but whether one is offline or online. Facebook, Twitter, Instagram are the new neighbours of the new world.* Our 21st century learners have digital limbs. We cannot amputate them at the front door of Learning**.**

Wrenching change has marked the decade of 2010-2020. Mind boggling developments in Information and Communication Technology, Satellite Technology, Engineering Systems, Infrastructure Networks and so on are such manifestations. Technology has reshaped the traditional paradigm of Teaching and Learning, has increased students' learning horizons and created the possibilities to achieve in a decade development that required generations in the past.

The age of information, sustained and accelerated by the web 2.0 and web 3.0 technologies, changed our lives in the 20th century and have an even greater impact in the 21st Century.

The Paradigm Shift presented in Table T.1 tabulates a swing from Instruction to Construction Pedagogy.

Table .T.1:   Swing from Instruction to Construction Pedagogy (Quoted From Townend, Clarke & Ainscow, 1999: 363)

SECOND MILLENNIUM THINKING	THIRD MILLENNIUM THINKING
Important learning can only occur in formal learning facilities.	People can learn things from many sources.
Everyone must learn a common 'core' of content.	Everyone must understand the learning process and have basic learning skills.
Education and leaning are individual activities.	Success is based on how well learners learn as individuals.
Education and leaning are highly interactive activities.	Success is based on how well learners work together as a team.
Formal education prepares people for life.	Formal education is the basis for lifelong learning.
The more formal qualifications you have the more successful you will be.	More capability & adaptability you have, the more successful you will be.

Digital Culture

The increasing prevalence and impact of digital technology has resulted in the emergence of a digital culture. Teachers and students, in particular, are increasingly

immersed in a digital society. True, our culture is getting increasingly digital, to the point where the term "digital culture" has become redundant. The existence of all-pervasive digital technology determines and shapes digital culture. In the online Journal of Magazine and New Media Research, David Abrahamson of Northwestern University provided a bibliography of books and essays on "Digital Culture, Information Technology, the Interest, and the Web."

Digital culture is defined as a social phenomenon in which Digital Natives and Digital Immigrants alike assimilate their digital mindset and digital habits into the new digital environment. The terms "digital native" and "digital immigrant" are defined by Brooks Young (2005): A digital native is a user of technology who was born into the digital world and is under the age of 30. A digital immigrant is a technology user who was not born into the digital world and is over the age of thirty. In the "digital world with computers, videos, and the Internet," digital natives learned their first information literacy skills. On the other hand, digital immigrants developed their information literacy skills "in the print world." Immigrants are thrust into a new culture in which life is very different from what they are used to. They begin to adapt and eventually fit in as they learn about their new culture, its language, accepted habits, and nuances. They may even become undetectable as they learn more about their new culture, its language, accepted behaviors, and nuances.

Coburn (2004) devised the following formula to visualize this process mathematically:

User Crisis vs. Total Adoption Pain: Change in Technology Use = f (user crisis vs. total user adoption pain)

That is, the relationship between the user's crisis and the perceived pain of adoption influences how they use technology. Teachers will embrace and apply new technology as the situation worsens, numbing the perceived pain of embracing new technology.

Unesco's Model Of Teachers' Digital Competency

"Without E-Matured teachers, students will not be benefited from the digital technology" - UNESCO, 2016

The adoption of the 2030 Agenda for Sustainable Development at the UN General Assembly in September 2015 necessitated Member States to abide by the Education 2030 Framework for Action to achieve Quality Education through ICT. Realizing the importance of ICT Competencies for Teachers, UNESCO came out with an ICT Competency Framework for Teachers in the year 2018, which is an improvement of its

earlier version of the same namely, 2011 Model. It comprises of three developmental stages on the basis of the teaching approaches, as shown in Figure F.1.

Figure F.1: UNESCO ICT Competency Framework for Teachers (2018)
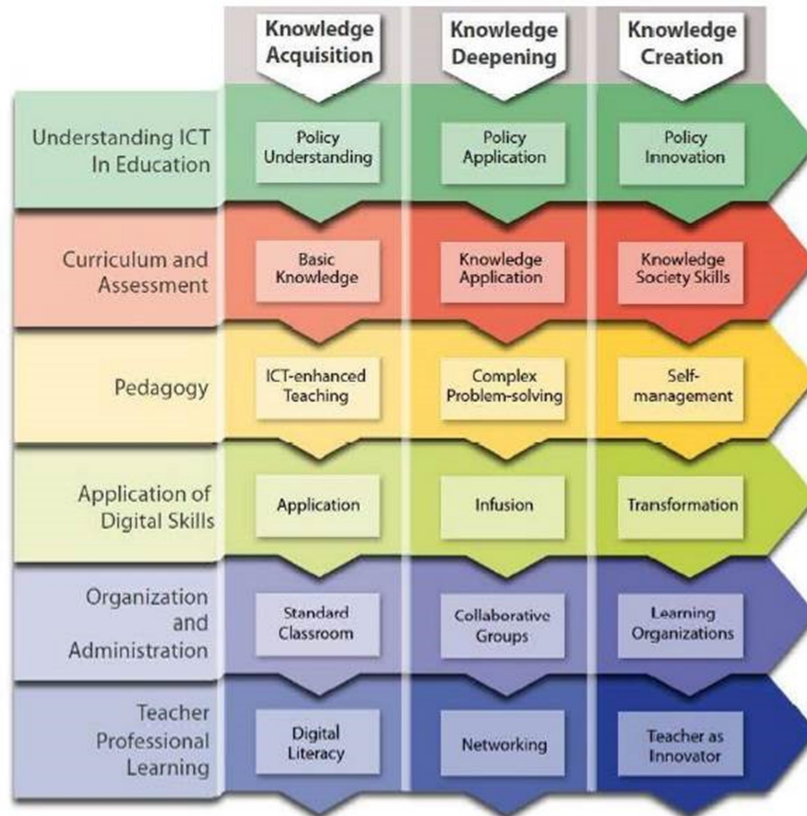
Knowledge Acquisition Stage

At this stage, Teachers gain knowledge on using technology for teaching.

Knowledge Deepening Stage

At this stage, Teachers gain ICT-skills in order to facilitate student-centred learning environment, which is co-operative and collaborative in nature.

Knowledge Creation Stage

At this stage, Teachers gain ICT Competency which motivates them to create the new knowledge needed for a prosperous society.

The six aspects of a teachers practice namely Understanding ICT in Education Curriculum and Assessment, Pedagogy, Application of Digital Skills, Organisation and Administration, and Teacher Professional Learning form the basis for the UNESCO ICT

Competency Framework for Teachers which in turn, produces 18 modules emerging from the intersection of the 6 aspects and 3 approaches.

Internet Landscape

There was a consistent spurt in the growth of Internet users in India due to cost, availability and connectivity factors. India had 560 Million subscribers in 2018, next to China only. Indians download 12.3 Billion Apps in 2018, larger than that of any other Country with the only exception of China. The average Indian spends 17 hours on Social Media each week, more than that of China and the United States.

What transpired on internet and some of its most-popular platforms in 60 seconds in the recent years are presented below in the Info Graph:

**Figure F.2: Internet Landscape-One minute on Internet in 2021**
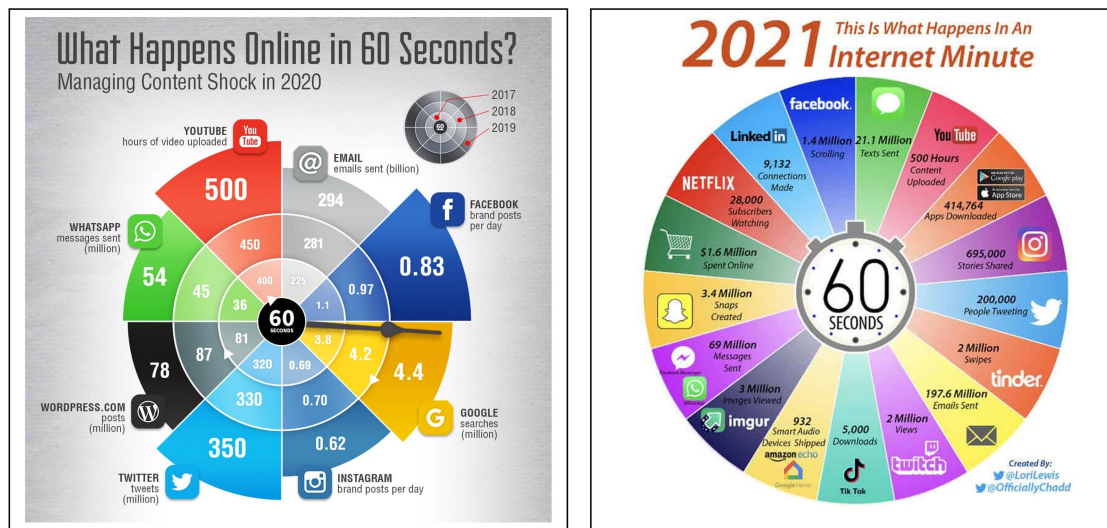
What transpires on internet and some of its most-popular platforms in 60 seconds in 2021 is presented below:

1. 1.4 Million Scrolling in Facebook in a minute

2. 69 Million Messages sent through WhatsApp and Facebook Messenger

3. 500 Hours Content uploaded on YouTube

4. 4,14,764 Apps are downloaded from Apple App Store and Google Play Store

5. 6,95,000 stories shared on Instagram

6. 2,00,000 People Tweeting

7. 2 Million Swipes on website Tinder

8. 197.6 Million emails sent
9. 2 Million views in Twitch
10. 932 Smart Audio Devices shipped in Amazon Echo and Google Home
11. 3.4 Million Snaps created on SnapChat
12. $1.6 Million spent online per minute
13. 28,000 Subscribers watched Netflix

Figure F.3: Internet Users in India and China - A Comparison
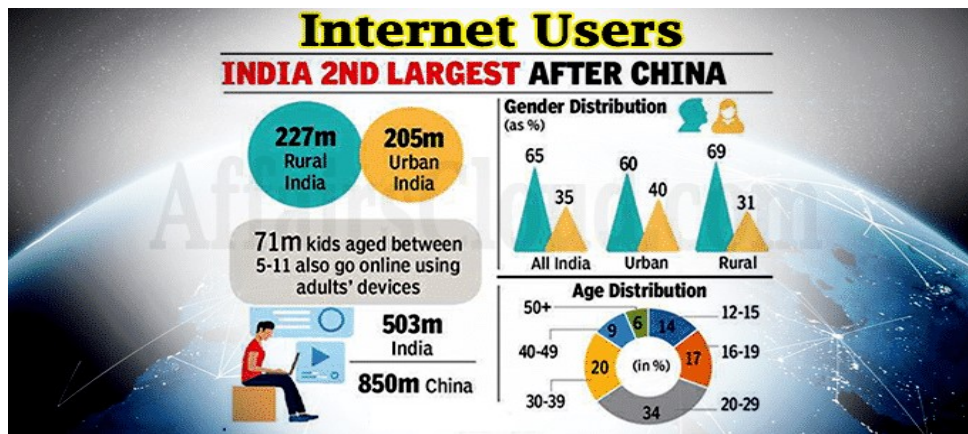
India has around 448 million social network members in 2021, up from 351 million in 2019. The Digital India programme, supported by the Indian government, has also played a significant role in this expansion. In the year 2020, when the COVID-19 pandemic it, many people turned digital. According to the data, India's social media growth and other patterns are set to continue as presented in the following India's Digital scenario.

Figure F.4: Internet Penetration in India (2015-2019)
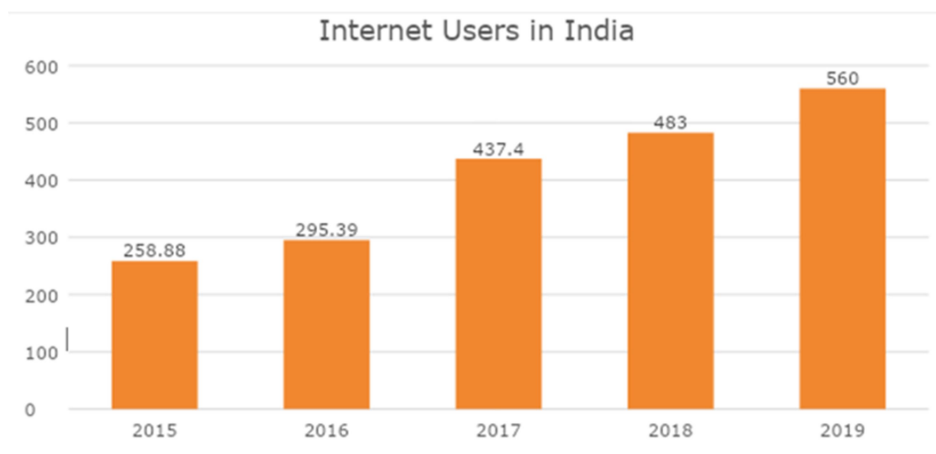
The growth is significant irrespective of the rural, urban locality. It reached 639 million populations in Dec. 2020.

Concluding Remarks: Digital Education Scenario (Going Down The Rabbit Hole)

According to the 2022 UGC data, India has 1027 Universities in which there are 54 Central Universities, 444 State Universities, 403 Private Universities, 126 Deemed to be Universities, 132 Institutes of National Importance including IITs, IIITs, NITs, AIIMS, IIMs, IISERs and 52,627 Colleges in the Country. India has succeeded in expanding its network of higher education institutions to become the world's largest higher education system. However, this vast network has not yielded the desired outcome in terms of academic excellence. According to a government assessment cited by India Today, only 15.8% of the total papers published by Indian researchers appear in the top 10 journals worldwide. In terms of scientific work published in the top ten journals, India trails the United Kingdom (37.3%), the United States (36.2%), Germany (33.4%), and China (33.4%). With regard to the status of Digitization in Indian Higher Education, while significant achievements have been made at one extreme, the Digital Divide is visible in which the other extreme starves of even high speed internet connectivity, etc. An attempt to analyze the digital conditions of Indian Higher Education in general and Indian Teacher Education in particular will be like jumping down the rabbit hole, as the girl Alice adventured in Lewis Carroll's wonderland.

Digital technologies' broad acceptance in many sectors of life involves the development of new skills and competencies. Ala-Mutka (2011) has rightly put up the case that digital skill is a basic requirement for Teacher Education. The investigation made by Zhihua and Zhaojun (2009) indicates that Colleges and Universities which ensure Quality in E-Learning enhanced their performance levels remarkably. Likewise, Marshall and Mitchell (2006) reveal that the application of the E-Learning quality model has been found useful for planning activities in Institutions.

All these researches indicate that Teacher Education Institution need research evidence for decision making on ICT investments. A review of research exposes a research gap in this crucial area, especially in the Indian context.

Teachers are expected to have a high level of digital literacy, and there is Universal Agreement that technology has complicated teacher education. Krumsvik (2014) has rightly pointed out that digital skill in the teaching career is more daunting than in other professions. The first is their ability to incorporate technology into their daily lives in such a way that students are inspired to do so as well. Next is pedagogical , as they help to acquire professional digital competence (PDC) by using digital

technology for specific professional duties, their biggest challenge is motivating their pupils to use ICT in productive and helpful ways. As a result, particularly in light of the role of the teacher in promoting technology use in the classroom, digital skill has become an indispensable requirement.

Thus, a review of research in this area provides evidence to the sad truism that teacher preparation is failing in this area and pre-service teachers do not integrate technology into their classrooms, proving that there is a yawning gap between pre-service teachers' technical and pedagogical skills. The studies yielded dismal results on the adequacy of teacher preparation.

Educational research is primarily concerned with gaining a better understanding of the many circumstances and their interrelationships that contribute to the educational process. These interrelationships are complicated by nature since they involve multiple variables, and their interacting patterns are influenced by a variety of factors. As a result, any organized effort to investigate such a complicated network of interconnected variables will have to concentrate on a small number of variables at a time. This entails focusing on the study problem and defining variables in such a way that they are meaningfully stated and can be examined in a methodical manner. Despite the fact that ICT use is on the rise, there has been very little research in this field. In an era of educational responsibility, the question of whether students enrolled in e-learning are held to the required level in important dimensions such as e-maturity and digital culture arises, as illustrated in Figure F.5.

Figure F.5: What leads to the Research Need and Problem?

The increasing use of Web 2.0 tools in e-learning systems, as well as various strategies such as sharing, tagging, rating, and commenting, open up new avenues for communication, collaboration, and active participation in the learning process. Universities, in this context, require research evidence and support in order to make

decisions on ICT and E-Learning initiatives. A thorough analysis of the literature reveals a research deficit in the crucial and critical fields of e-maturity and digital culture. Even the most effective system can fail to deliver if it is not constantly monitored, and even the most well-run system can become obsolete and hazardous if it is not constantly scrutinized. Hence, the present paper calls for a plethora of Research in this vital area of education.

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