Digital Transformation in the Education Sector: India's Future Path for Padhai

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Abstract— **The Covid-19 pandemic has affected economies worldwide, so the education sector has been silent. By the time the epidemic ended in March 2020, it had spread to over 185 countries and more than 95% of institutions, universities, and schools had shuttered. There were few plans to move from offline to online training because the disease spread so swiftly, and none could have foreseen the risks and possibilities such a disruptive change in the sector may bring.**

Teachers increasingly expect technology to facilitate remote learning and instruction, which has had a severe effect. But the digital revolution in education is more than just post-COVID-19 online learning and teaching. Most schools, colleges, and universities now understand how crucial digital transformation is to the educational environment, even though only a small number have just started utilizing technological solutions due to the epidemic.
On March 25, 2020, in reaction to these circumstances, the government imposed a nationwide lockdown, which hurt the educational system.

Since classroom instruction remains the main focus of the Indian educational system, academic institutions are finding it very difficult to operate in the current setting. The objective of this chapter is to measure the extent to which the COVID-19 pandemic has incited digital transformation in India's educational system, pinpointing some of the most noteworthy areas of change and offering a blueprint for future e-learning platforms. The information was gathered from secondary sources, which included government publications, magazines, newspapers, and journals.

The study found that India unlocked a range of virtual technologies from elementary school through higher education, where learning activities changed to online learning. The findings imply that there may be areas of exceptional talent in India that have the potential to expand access and take the education sector to new heights. Some people have never been able to attend school because of space constraints. While the pandemic has caused great suffering for individuals worldwide, there is still an opportunity to assess the advantages and disadvantages of the technologies that have been employed, the costs associated with them, and the possibility of scaling these technologies up to improve accessibility. According to the study's findings, using digital tools in the future could drastically change how students and teachers learn, as well as greatly increase the quality of education.

Keywords— Online learning, modern education, Covid-19, digitalization, and traditional education.

INTRODUCTION

India has the second-biggest educational system in the world, behind China. The COVID-19 pandemic has impacted 63 million educators across 165 nations, as per the United Nations Educational, Scientific, and Cultural Organization (UNESCO). In India alone, almost 320 million children, or 1.3 billion students, were unable to attend schools or other institutions, according to the National Statistics Office's 75th round (2017–18).

Educational technology has allowed for the replacement of the previous educational system with an online teaching and assessment paradigm. The Indian government has declared that closing and locking down schools is a legitimate measure to impose social segregation within neighborhoods. tests, entrance tests for various universities, school admissions, competitive exams, and other educational activities are held during this time.

As the days pass without a workable solution to stop this outbreak, the shutdown of colleges and other institutions is having a major detrimental effect on education across the country. The Indian education system has seen a substantial transformation that has resulted in a shift towards online education in the areas of learning, teaching, and evaluation practices. To meet the preset goals and objectives, virtual education is the main emphasis of this transformation. The topic of digitization in the realm of education worries many parties.
One of the main goals of educational institutions has become preparing future professionals to be able to deal with problems and search for solutions, including digital competence as a vital skill set. In this globalized era, ICT skills are becoming increasingly relevant in every context, especially in the workplace. The government is presently proposing several policies, programs, and strategies to address advancements in educational technology within the education sector.

India is a vast country with a diverse population in terms of culture, language, legacy, and other factors. The educational system reflects this diversity. Some schools use the Gurukul system, which emphasizes the value of education above technology, and has students learn under trees. Certain schools have air-conditioned, completely digitalized classrooms and transportation. While some schools have the financial wherewithal to engage in international exchange programs, others stress the use of literature and their kids' physical development through internal activities. There are schools where students battle for books at the same time. India is a major participant in the global education market. More than 1.4 million schools and more than 36,000 higher education institutions across the country serve more than 227 million students, according to a National Sample Survey Office report. One of the largest higher education systems in the world is found in India. Nonetheless, the educational system still has a lot of space for development.

Before the lockdown, nobody could have expected that the face of Indian educational institutions would change so significantly. Formerly strict policies against students bringing electronic devices into the classroom have given way to virtual learning environments. As students and teachers adjust to this new normal, it is surely more challenging for them to deal with. This book chapter seeks to give a road map for upcoming e-learning systems, a summary of some of the key areas of change in the education industry, Studying the ways in which the COVID-19 pandemic has impacted schooling in the present.

THEORETICAL FRAMEWORK

One of the main trends in the sector is the expansion of digital technology. About schools, colleges, and universities in particular, there is ample opportunity for digital transformation in the Indian educational system. On the other hand, digital techniques and digitalization can be used to digitalize lecture material and make educational materials or modules available online. It incorporates both cutting-edge working practices and inventive technology. Because it is so uncommon, leadership control in the sphere of education is equally valuable to technological know-how. These days, a large use of digital resources is necessary for students. Prospective students look for advanced learning opportunities outside of traditional classroom settings all the time. To deliver high-quality education, educational institutions need to develop new and creative teaching strategies while taking into account the evolving needs and situations of youth.

The power of technology cannot be disputed. With 1.31 billion people residing in the country, the share of technology has grown dramatically in recent years. With more than 140 million mobile phone users and the second-highest percentage of social media users worldwide, India has a significant possibility to advance in this field and profit from the use of technology in education.

Prime Minister Modi has introduced initiatives such as Digital India, which entail significant accountability in the realm of digital technology. India will consequently develop into a knowledge economy and a digitally enabled society. The "Digital India" concept seeks to change the country's educational framework. It offers an avenue for global access to educational materials.

These days, students spend a lot of time on the internet and their cell phones to expand their knowledge and gain access to a variety of content. For educational establishments such as colleges, universities, and schools, the only choice is to adjust to this new technology. The most recent technological advancements have given students access to a novel and unique platform. Thanks to the continuous advancement of technology, the rising ubiquity of social media, the Internet of Things (IoT), artificial intelligence (AI), augmented reality, and virtual reality, the Indian education system is experiencing newfound optimism.

OBJECTIVES

1. To determine how COVID-19 has affected the Indian educational system

2. Conducting a study on the various opportunities and threats that the educational system might encounter.

3. To determine the future potential of digital education in India

METHODOLOGY FOR RESEARCH

Data Sources:

Relevant research journals, magazines, and websites that showcase current literature were the sources of data used for this study. There have also been considerations from other government reports.

Scope of Study:

A vast array of digital technologies is utilized widely daily in India, home to over a billion people, many of whom use the internet. In the field of education, there are numerous opportunities to support students' knowledge acquisition. The following years will see a rise in the use of digital and live virtual. Classrooms with different instructional levels. Teachers and students will be able to attend the session at any time and use Open Educational Resources to learn more effectively. Concepts from virtual and augmented reality have been introduced simultaneously to help students understand the curriculum in real-world contexts and to increase clarity, accountability, and student engagement.

Literature Review:

The present educational system is explained by Pulkit (2020). India is a significant player in the global education market. Serving more than 260 million students, the nation is

home to about 800 universities, 65,000 other institutions, and over 1.5 million schools. That being said, the educational system still has a great deal of space for improvement. With the second-highest graduation rate in the world and the largest population of tertiary age, India is well-positioned for substantial educational system expansion in the years to come.

The benefits of online learning over traditional classroom training were highlighted by Korableva (2019). To ascertain which of the two most recent online platforms—MOOC and Course Era—offers users the most convenience and comprehensive solution, more data was obtained as part of the study's extension.

Kapur (2018) focused her research on problems that the Indian educational system faces, like the importance of top-notch education, challenges with the conventional educational paradigm, limited student involvement, etc. The curriculum, instructional strategies, trained teachers, and the standard of education all considerably contribute to the issues that the Indian educational system faces, according to the study's conclusions.

According to Arnab Kundu and Dr. Kedar Nath Dey 2018, the Department of Electronics and Information Technology funds research and development projects that revolve around content creation at different academic and educational institutions, to develop tools and technologies to support e-learning. Another significant factor in the growth of e-learning in India has been the Government of India.

Human resource development programs, faculty training initiatives, and research and development technology activities are being done to enhance the general literacy and educational levels of the country. The purpose of remote learning is to increase literacy. During the 2017–18 fiscal year, the government set aside Rs. 17,000 crore to assist the Skill India Mission. Both domestic and foreign suppliers of goods and services to the nation's e-learning industry have benefited from this investment.

Omer (2018) looked at academics' perspectives on the necessity of digital transformation in the education sector in his study. He discovered that scholars are adamant that the educational system needs to progress and go through a digital revolution as the globe grows more technologically connected. Academicians share their thoughts on how to design physical environments and infrastructure that are equipped with information and communication technology, as well as how to accomplish effective learning through digital tools like artificial intelligence, learning analytics, online learning, virtual learning, and more.

Arvind Kaur (2018) examined the flaws in our academic curriculum in his doctoral thesis, noting that many government universities do not update their curricula, in contrast to private universities. The state of skill education is deteriorating, industry-academia interaction is not given as much priority in our curriculum, traditional classroom methods are still used in many institutions and schools, and efforts to improve the quality of higher education in India are not receiving as much attention.

Jennifer L. Reeves and Glenda A. Gunter investigated how digital tools improved student-teacher cooperation and increased student involvement during the learning process in their 2017 study. They also saw how students used user-friendly professional educational apps to increase their knowledge and completed worksheets and online assignments. Chahal (2015) conducted research and found that a variety of factors, such as ineffective teaching methods, a shortage of skilled and experienced teachers, disorganized curricula, poor lecturer-student communication, a lack of state-of-the-art methods, and financial challenges, all contribute to the subpar quality of instruction in our university system. Consequently, improving the efficacy of our educational system will need a great deal of work.

ESSENTIAL AREAS OF DIGITAL CHANGE IN EDUCATION

1. Using coaching technology in the classroom:

University, college, and traditional brick-and-mortar education were abandoned after the pandemic. Nearly all educational institutions have embraced digital teaching approaches. Nonetheless, the learning results are also unclear. Since classes are gradually commencing and the COVID outbreak seems to be under control, parents are not sure if they may take their kids to the institution. As a result, institutions are now compelled to accept the move to digital education. Here are some ways in which they are emphasized:

- *Thermal screening and sanitation:* The template is designed so that author affiliations are not repeated each time for multiple authors of the same affiliation. Please keep your affiliations as succinct as possible (for example, do not differentiate among departments of the same organization). This template was designed for two affiliations.

- *Contactless attendance:* Similar to the restaurant's contactless menus. We can scan a menu's QR code using our smartphones. This technology might also be advantageous to institutions. Students have two options for recording their attendance: scanning their ID cards or using facial recognition technology. Daily engagement in biometrics would eventually become unattainable.

- *Social distance control system:* Some regions have deployed AI-based technologies to monitor public gatherings and halt the virus's spread. Using this technology, educational institutions can enforce social separation and keep an eye on health standards.

2. Using technology admissions:

It usually takes a while to complete the registration or admissions procedure. Pupils who want to apply for admission and produce the required documentation have to wait in line. Students must visit the establishment to learn the status of their form submission. Reviewing records, verifying qualifications, listing students, and updating them on the progress of their applications are among the administrative responsibilities performed by the admissions team. All stakeholders, including

parents, teachers, students, and administrators, would have access to the next age's enrollment process online. The organizations can benefit from the application process in the following ways:

- Employers should refrain from needing applications on paper; technology can assist in selecting eligible applicants automatically.
- Routine inquiries can be handled by an automated response system.
- Real-time access to data regarding courses, teachers, students, and other matters is provided to schools.
- Students shouldn't have to waste time waiting in line to check the progress of their applications.

3. Modifying EdTech frameworks

The term "edtech" refers to a broad category of concepts and tools used to update education for the twenty-first century. Smart tablets, online curriculum management systems, and interactive whiteboards are a few examples. Chalkboards, overhead projects, and a mountain of books might have been present. The general digital revolution in the education industry led to the replacement of the bulky books with digital tablet versions, the overhead screens with interactive front-of-class presentations, and the chalkboards with digital whiteboards.

4. Gaining knowledge via virtual reality (VR) and augmented reality (AR)

Virtual and augmented reality applications in the classroom are growing quickly. The enhancement of real-world artifacts by digital perceptual knowledge in an immersive setting is known as enhanced reality. On the other hand, virtual reality describes a simulated three-dimensional environment that users can interact with by donning VR goggles or other hardware. This technology makes subjects like biology, geography, and history more engaging. Originally, educational institutions used tools to help with instruction, such as Zoom and Google Meet. But now, companies may build a unified online experience by merging these resources with their website.

5. Portal for intellectual exams

For educational institutions, grading and assessment pose extra challenges. It is often difficult for students to pass unfair tests. Educational institutions should incorporate webcams into their online exam platforms to avoid this. It will be helpful to watch out for suspicious activity during tests, like tab-switching, background conversation, sharing images, and more.

6. The platform for learning experiences (LXP)

The mental map of a student is called LXP. Whereas a learning management system (LMS) offers a one-way learning roadmap, Linux offers autonomy. One can find 1, 2, 3, and so on in an LMS, for instance. Based on students' interests and speed, LXP provides well-selected material.

An LXP offers curriculum flows as an option as opposed to a preset curriculum.

7. Modifications to Methodologies for Teaching and Learning

The pandemic has forced educational institutions to move to a partially, if not entirely, online learning environment. BYJU's recent acquisition of Aakash is evidence that the EdTech pioneer thinks the hybrid learning strategy has a promising future. With its fast-paced time-lapse style, the digital transformation of education has provided a closer glimpse at the educational institutions of the future. This relates to a complete change in perspective, attitude, and teaching methodology in addition to the virtualization of classrooms.

ADVANTAGES OF DIGITAL TRANSFORMATION IN EDUCATION

1. Collaborative education:

Collaboration is required for digital learning. Teachers can build and oversee groups using learning platforms. Collaborative creative tools such as Google Docs, Twiddla, Edmodo, and others facilitate co-authors' papers and presentations. These interactive technologies are already in use by organizations.

2. Focused curriculums towards the Future:

An institute teaches science fiction films, robotics, automation, AI, and potential courses. Despite the abundance of data showing that the needs of the workforce are changing and will probably increase substantially in the future, the organization is not equipped to provide them with the necessary training. The curriculum revisions will not take many years to design and refine. There is increased availability of timely and relevant content for students. For the system to quickly update and function, daily access to new capabilities and content is required.

3. Boost communication between educators and parents:

Research indicates that when parents encourage their kids' intellectual growth, the youngsters do better academically and are typically healthier. Automation encourages parents to be involved in their ward's growth by giving them access to electronic data and progress notes. Assume that by recommending careers based on metrics calculated based on the learner's capabilities and limits, the program provided an effective solution for career advising.

4. Monitoring of student performance :

One result of the digital revolution in education is the availability of a more useful tool for monitoring students'

progress. When it comes to kids' work, technology can be a useful tool for gathering data that lets instructors and parents track their development. For example, manuals or creative work may be compared to previously digitally captured content regularly to provide a better understanding of who is more proficient and who requires more attention.

5. Better outcomes with data analytics:

Schools can track and enhance performance with the help of analytics. Through an examination of the data gathered from the usage of technology in the classroom, the instructor can better understand the needs of each student. It is easier for a student to enroll in the course if they can comprehend why they missed a term. With the use of technology, we will be able to identify these defects much more quickly and precisely.

DIFFICULTIES WITH THE DIGITAL EDUCATION TRANSFORMATION

1. Inequitable Access:

It seems improbable that all students could afford the costs associated with modern technology. For this reason, for the digital revolution to thrive as a whole, educational institutions must provide all necessary resources to students in an accessible manner. Teachers, on the other hand, are under no need to implement education transformation at the level of each student; however, you are free to limit its application to materials utilized outside of the classroom.

2. Compatibility with different systems:

Today's world's enterprises and organizations mostly depend on highly developed infrastructures and systems to guarantee effective and efficient day-to-day operations. One of the main problems with the digital transformation of education systems is that they are incompatible with modern digital technology. An incompatible integration system must be upgraded, changed, or replaced, all of which are costly and time-consuming tasks.

3. Unwillingness to adapt:

Approximately 70% of Indians employed in the public sector believe that their digital skills are not as sophisticated as those of people in the private sector. The next big steps towards digital maturity are opposed by several powerful policymakers, notwithstanding this. People essentially prefer to become comfortable with what they do rather than venture outside of it. causes a slowdown in growth and development. Many in the education field are hesitant to learn new methods or procedures and fear failing while they are transitioning to new cultures, technologies, or ways of thinking.

4. Inadequate expertise or abilities:

Sufficient proficiency, confidence, and aptitude are required to promote creativity within the organization. To ensure a smooth and efficient transition to digital, academic institutions need to either compete for a small pool of talent or implement creative ways to develop emerging players through the use of cloud infrastructure.

5. Data dependability:

In today's technologically advanced world, many metrics supply schools, colleges, and trainers with information on prospective students, internal efficiency, user experiences, and much more. To summarize, the level of detail is priceless. The issue is that these statistics are inconsistent, infrequent, and untrustworthy, particularly in the education sector. To acquire timely, reliable, structured, and organized data, educational leaders must integrate business judgments, create educated projections, and launch new educational initiatives. This will enable people to absorb the most relevant and helpful information, which is timely, well-organized, and correct.

6. Insufficient planning:

One of the most difficult barriers to success in the current world is determining where to go with digital transformation in each department or firm. The thought of widespread change may be terrifying, making it difficult to pick a course of action or devise a successful strategy.

KEY INITIATIVES OF THE GOVERNMENT

1. New Education Policy:

To position India as a global information powerhouse, the National Education Policy of 2020 makes significant improvements to the Indian educational system, ranging from elementary school to university level, with a focus on digital education.

2. The DIKSHA platform, or Digital Infrastructure for Knowledge Sharing:

DIKSHA is a nationwide school education platform that was launched in September 2017 and is now available to all states and the federal government for grades 1–12. as part of Prime Minister Vidya's Atmanirbhar announcement. The Bharat Programme, also known as DIKSHA, is the "one nation, one digital platform" for Indian education.

3. Swayam Prabha TV Channel:

To support and connect with individuals who do not have internet access.

4. Massive Open Online Course (MOOC):

The SWAYAM website provides MOOC courses affiliated with the National Institute of Open Schooling, spanning grades 9–12. There are currently 92 courses that have registered nearly 1.5 crore students.

5. On Air:

Shiksha Vani, e-PathShala, radio broadcasting, and the National Institute of Open Schooling's Digitally Accessible Information System (DAISY) for students with disabilities are provided to children who live in distant locations and do not have access to the internet.

THE PATH AHEAD FOR INDIA

Although the COVID-19 outbreak presented several obstacles to the education sector, it also provided a push that may enhance educational techniques and systems. The epidemic has enabled innovation in international information transmission strategies. Because many Indians live in distant locations without internet connection and attend government institutions that are much more impoverished, the situation was exceptionally difficult. Attempts were made at all levels to use online resources for continuing education, but not everyone was successful. Covid-19 has advanced the use of digital technology in education delivery. Universities jumped into blended learning, assisting professors in helping students become more technologically adept. Soft technology, online webinars, teleconferencing, virtual classrooms, digital examinations and assessments, and teleconferencing have all become commonplace, but in the past, we could have just discussed them or they would have been ineffective for 10 years or more. All education stakeholders—administrators, instructors, students, parents, and corporations developing novel technology for information dissemination—worked together in unexpected ways. The increasing use of digital technology is transforming the way education is delivered and received.

The reach of educational programs grows by the day as a result of education's digitalization. With digital education, instructors and students have more possibilities to teach and learn, which increases total participation in the educational process. Smartphones, tablets, MOOCs, smartboards, and PCs are examples of technologically improved learning aids that have radically impacted how education is delivered in educational institutions.

Additional evidence suggests that the Internet of Things (IoT) is one of the most cost-effective ways to instruct kids. It is also an effective technique to create an amazing learning environment for all users. EdTech businesses are continually looking for new ways to improve the number of educational options.

India's educational system is in disarray, particularly in rural areas. The sector is now facing substantial issues such as obsolete educational techniques, a teacher shortage, an insufficient student-to-teacher ratio, a scarcity of instructional resources, etc. However, as education becomes increasingly digital, kids in impoverished countries receive

Technology also allows teachers to communicate remotely with students in several locations at the same time. Furthermore, digital technology is helping to erase linguistic barriers. Local access to digital learning resources is now available.

SUMMARY

The COVID-19 outbreak precipitated a large, abrupt, and profound digital transformation in humanity. As a result of the epidemic, we had to completely adjust our lifestyles and business operations, notably in the classroom. Education quickly switched from a traditional classroom environment to a remote, digital one. Suddenly, a generation needed to learn how to use and manage digital technologies to participate in school.

This meant that enormous adjustments were required from the administration, the children's families, the instructors, and the entire society, in addition to the kids and teachers.

Despite the increasing use of digital tools and disciplines in educational institutions today, educators—including instructors, students, and administrators—have not received the training to assume leadership roles and act as change agents in the context of digital transformation. Students and their families were under a lot of stress because they needed so many different resources, skills, and abilities.

India's educational system will increasingly rely on digital learning in the future. It's incredible how swiftly smart technologies are altering the whole educational system in the country. The way digital education is delivered in rural regions is fast changing. Affordable, high-speed internet access is delivered directly to your device.

The advancement of technology has enabled rural youngsters to learn online and increase their knowledge and abilities. Academic institutions will soon have access to a broader range of cutting-edge digital goods from an increasing number of small, medium, and big EdTech start-ups in the education sector.

Taking decisive steps to develop legislation that will expand the country's digital education industry. The Center has urged state education departments to map each student's internet access to ensure that curriculum and instructional strategies are effectively planned. As with many other professions, digital education is poised to undergo significant changes.

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