Digitalization of Education in India

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Development, expansion and acceptance of information technologies have digitalized every aspects of human life. Education sector is no exception to such transformations. These information technologies have revolutionized the whole teaching learning process. Digital learning denotes to learning through digital platforms with the help of electronic gadgets and modern technologies. Government of India has taken various initiatives for promoting digital education across India both for school education and higher education. As a result, E-learning platforms for digital literacy have been promoted and online learning has been adopted by the teachers and learners. These initiatives have significantly transformed the prevalent traditional Indian education system. This research paper aims to discuss various initiatives taken by the Indian government in promoting the digitalization of education and highlights the benefits of digital learning and various obstacles in the path of digital India.

[**Keywords :** Digital initiatives, E-learning platforms, Advantages, Disadvantages, Technologies, Digitalization]

1. Introduction

The 21st century is an age of technology, innovation, and digitalization. Innovation, expansion, and acceptance of new

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technologies are making rapid changes in every sector of society. The Development of information and communication technologies has been helpful in emerging the process of digitalization that is influencing all spheres of society, economy, polity, information and education.

Technological revolutions have been dramatically altering the prevalent Indian education system. As a result, education system has been globally digitalized where virtual learning bounds no boundary of region, class and age. Now, learning is no longer an isolated learning but a virtual classroom based continuous ongoing learning which is easily accessible and shared among learners all over the world. E-learning is free from the predetermined boundaries of traditional educational system that was limited within the boundary of classrooms.

Digitalization refers to a process of conversion of text, picture, audio, video into a digital form that can be processed by a computer whereas digitalization of education refers to the use of digital technologies in the field of education to teach students therefore presenting a platform for e-learning.

Education refers to encompassing learning and skills through teaching by using a variety of methods and strategies in their instruction. Education is a lifelong process that aims to produce better citizens who could fit into this dynamic world and make a contribution to it.

Now a days, the use of technology is evident in every sector, therefore, promoting a wide platform for digitalization where computers, internet, and associated technologies are used to provide e-access or digital access to many things. The process of digitalization is the result of the Indian government's most aspiring initiative digital India : A programme to transform India into digital empowered society and knowledge economy. Digital India was launched on 1st July 2015 by our honorable Prime Minister Narendra Modi with an aim to connect rural India with high-speed internet facilities and improving universal digital literacy. Various initiatives have been taken by the Indian government under digital India campaigns like digital empowerment of every citizen, availability of digital infrastructure, facilities of e-governance and e-services make available to every citizen.

2. Objectives of the Paper

This paper has following three objectives :

1. To discuss various initiatives taken by the government of India for the digitalization of school and higher education.
2. To analyze the advantages of digital learning in India.
3. To examine the barriers in the path of digital learning in India.

3. Research Methodology

This research paper is based on secondary data sources, collected from national and international journals, published government reports, newspapers, websites in order to make in-depth analysis. This study is descriptive in nature and make an attempt to understand digital initiatives taken by government for digitalization of education in India.

4. Initiatives taken by Government of India for the Digitalization of School Education

MHRD took the first initiative on 9th July 2017 by organizing a conference in reference to the digitalization of education with an objective to bring transformation in the education system. MHRD has launched various digital platforms for e-learning like SWAYAM (India's own MOOCs), Swayam Prabha, National Digital Library, and National Academic Depository.

These initiatives taken by Government of India are as following :

4·1 NROER (National Repository of Open Educational Resources)

NROER is a joint initiative of CIET (Central Institute of Educational Technology) and NCERT, launched in August 2013 in Collaboration with the Department of School Education and Literacy. NROER is an open resource platform for online learning. It has large number of educational resources in different educational domain and in different languages for primary, secondary and senior secondary schools. It has developed 19000+ e resources and contains 441 eBooks easily accessible to the users. Its online courses combined both online and blended.

4·2 DIKSHA (Digital Infrastructure for Knowledge Sharing)

DIKSHA is an initiative of National Council of Educational Research and Training (NCERT), Ministry of Education. It is

basically a learning portal developed for school education and hence promotes inclusive learning, especially during the crisis of COVID-19 that disrupted whole education process. DIKSHA is based on various core principles like open architecture, open access, open licensing diversity, choice and autonomy and was launched by Hon' Vice President of India on September 5th 2017.

The major benefit of this learning platform is that it supports 18+ languages across India and share e-content (text, video) regarding curriculum of NCERT, CBSE and SCERT. It has its own application named DIKSHA - (Platform for School Education) that has been downloaded by more than 10 million learners with the rating of 4.4. This learning platform has been adopted by 35 States/ UT's and millions of learners and teachers. Current data indicates that DIKSHA portal has been visited by 55,75,53,542 (550 million) times by the users.

DIKSHA platform is an open platform where learners can access quality content and teachers can contribute/ share their knowledge in the form of teaching videos, explanation videos, lesson plans, experiential learning videos and practice questions through the national platform known as Vidyadaan. Vidyadaan with its tag line "Share for your Care" asks individuals and organizations across the country to share their knowledge in order to enhance quality learning.

4·3 NISHTHA (National Initiative for School Heads' and Teachers' Holistic Advancement)

NISHTHA is a capacity building programme that aims to improve quality of school learning by integrated teacher training. This programme targets to train 42 lakhs teachers subsequently both at National and State level by National Resource Groups (NRGs) and State Resource Groups (SRGs). The objectives of the programme includes improving learning environment, outcomes and promoting experiential and joyful learning by training Principals and the teachers.

Training	Target	Achieved
State Resource Persons Leadership	5490	4011
Key Resource Persons	27452	19408
Teachers	3632100	1578214
Heads/ Principals	349385	171679

Table on preceding page clearly indicates the targets set under this programme and their achieved status. NISHTHA is an important step taken by Ministry of Education in building teachers' capacity and promoting integrated learning among teachers.

4·4 e-PATHSHALA : Learning on the Go

e-PATHSHALA is a joint initiative of MHRD, CIET and NCERT and was launched in November 2015. It has large number of e-books and e-contents in the form of text, audio-visual that are beneficial for teachers, students, parents, researcher and educators. These e-contents are easily accessible either through the portal or the application. This platform has total of 504 textbooks and 3886 e resources for learners. It has its own application with 4.5 rating and has been installed by 2.62 million people. EPATHSHALA facilitates online resources of learning for students- can access textbooks from class 1st to 12th and online material, participate in workshops, contests and exhibitions etc. Teachers can enrich learning process and educators can improve the quality of curriculum.

5. Initiatives taken by Government of India for the Digitalization of Higher Education

Main initiatives taken by Government of India for the digitalization of higher education include the following :

5·1 SWAYAM

SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) is India's indigenous MOOCs. The concept of MOOCs deals with online delivery of lectures or e-learning content (audio, videos, and texts) to a large number of people simultaneously. SWAYAM was launched on August 15, 2016, and is based on three principles of education i.e. access, equity and quality. It aims to provide the best learning to all sections especially to the most disadvantages group and seeks to bridge the digital divide gap by bringing digital revolution and enhancing the e-learning platform. SWAYAM courses not only provide the platform for e-learning but also provide authentic certificates to all registered members after fulfilling certain eligibility criterion.

SWAYAM courses include videos tutorials of the lectures, e-content of the subject matter, self-assessment quizzes and assignments and discussion forum to ask queries. Total nice

coordinators (UGC, NIOS, NCERT, IGNOU, NITTTR, NPTEL, AICTE, CEC, IIMB) are currently associated with SWAYAM in order to provide effective online learning. SWAYAM has completed more than 2,748 courses in various disciplinary. Almost 12 million students have been enrolled and 6 lakhs have been awarded certificates.

5·2   NPTEL

NPTEL is a joint initiative of IITs and IISCs, funded by MHRD Government of India. It aims to provide e-learning through video-based courses in all major branches of engineering and physical sciences at the undergraduate and post-graduate levels. NPTEL is the largest online repository in the technical field and has conducted almost 392 courses in various disciplines with almost 20 lakhs enrollment. It has its own YouTube channel with more than 1.5 million subscribers and 819 million viewers.

5·3   SWAYAM PRABHA - The 32 Educational DTH Channels

SWAYAM PRABHA is a 32 DTH channels programme on 24x7 bases that aims to telecast high-quality educational content by using the GSAT-15 satellite. This educational content will be of 4 hours in a single day that will be repeated 5 more times for the convenience of the students. These DTH channels cover various courses for undergraduate and postgraduate students in diverse disciplines such as science, commerce, humanities, medicine, engineering, law, agriculture etc. developed by NPTEL, IITs, UGC, IGNOU, NCERT, NIOS. These channels also include various modules prepared for 9-12 level students and teachers for their and learning and training respectively.

5·4   e-PG PATHSHALA

e-PG PATHSHALA is an MHRD sponsored project under NME-ICT (National Mission on Education through ICT). It covers almost 70 subjects and 22000+ modules provide (e-text/videos) and 3200+ experts' opinion.

5·5   e-Pathya

e-Pathya is an alternative of e-pathshala that can be accessed online. It is beneficial for those students who are pursuing higher education in distance mode.

5·6   e-Adhyayan

e-Adhyayan is a platform that provide e-books for under graduate and Post-graduate courses.

5·7   NDL (National Digital Library)

National Digital Library is an initiative of Ministry of Educations, Government of India sponsored project under NMEICT, and coordinated by IIT, Kharagpur. NDL aims to collect, preserve and disseminate e-books and provide easy access of books to students. It provides e-content in all disciplines in various Indian languages, and support all academic levels including researcher and life-long learner. There are more than 52899292+ learning resources available on NDL platform that covers all major disciplines (Science, Technology, Humanities, Agriculture and others) and academic levels (Primary to Post-graduate). NDL has its own learning app for android phones that won the award of mBillionth South Asia in 2017 in learning and education category.

5·8   NAD (National Academic Depository)

NAD is an initiative of Ministry of Education, Govt. of India to facilitate online storage of all academic documents provided by institutions. It is a trusted platform to keep our documents safe and get easy and quick access to all those documents. NAD secures all documents and provides easy access whenever needed, therefore avoids the problem faced after missing documents, damage of documents. NAD is one of significant efforts in the making the vision of digital India come into reality.

5·9   Shodhganga

Shodhganga is a reservoir of Indian thesis and dissertations, setup by the INFLIBNET Centre. It ensures online availability of e-theses and dissertations and facilitates its access to all academic levels. It also ensures quality and standards of research and avoids the problem of duplication of research. It has more than 283943+ theses and 7678+ synopsis.

5·10   e-ShodhSindhu

e-ShodhSindhu is an initiative of MHRD, Govt. of India, being executed by INFLIBNET. It facilitates access to more than 7,200 core and peer reviewed journals and full text e- resources, databases in

different disciplines at lower rate of subscription. It aims to promote usage of e- resources in Universities, Colleges and technical institutions in order to bridge digital divide and reach towards an information-based society. It has more than 164300+ e-books with 10000+ journals and 22 resources.

5·11 e-Yantra (Engineering a better tomorrow)

e-Yantra is a MHRD sponsored programme under National Mission on Education through Information and Communication Technology (NME-ICT). e-Yantra is a platform for developing robotics by using the talent of Indian youths. It organizes e-Yantra Robotics competition for engineering, science and polytechnic college's students and also provides internship opportunity at e-Yantra lab to them. e-Yantra lab setup initiative enables colleges to set up robotics lab to provide training to teachers and promote college students to show their innovative ideas about robotics. It organizes symposium, seminars and workshops for the teachers on induction to Robotics in order to enhance their skills.

5·12 Virtual Labs

Virtual Labs is an initiative of MHRD, under NMEICT to promote remote-experimentation for UG and PG students and researcher scholars of various disciplines of Engineering, science and technology. It facilitates easy sharing of costly and limited equipment's, resources among large number of students. It covers various disciplines like Electronics and Communications, Computer Science and Engineering, Electrical, Mechanical and Chemical Engineering, Biotechnology and Biomedical Engineering, Civil Engineering, Physical sciences and Chemical sciences.

According to the latest data released by MHRD, a total number of 113 new experiments have been developed and 35, 99784 students have availed the opportunity of usage. It has 707 nodal centers in India.

6.   Advantages of Digital of Education

Advantages of digital of education are as follows :

- Digital education provides students flexibility in terms of time scheduled for learning.

- Digital education promotes a platform for globalized learning where both instructors and learners can be globally connected and befitted.
- Digital learning platform easily attract the attention and engagement of youths by making the teaching pedagogy more interesting.
- Digital education promotes inclusive education by addressing the issues of rural-urban divide and gender disparity in learning.
- Digital education is helpful in enhancing skills and specialization thus can increase employability quotient.
- Digital education is helpful in reducing illiteracy rate.
- Quality content by experts provided during e-learning helps the students to be specialized in particular domain of knowledge.
- Online education is not only economical but also save time by immediate, effective and advanced transfer of knowledge.
- Digital education can be availed to a large section of society without the constraint of time and space.

7. Disadvantages of Digital Education

Disadvantages of digital education are as follows :

- Lack of proper electricity, technology and internet facilities are major barriers in digitalization of education in India.
- Idea of digitalization of education can't be successfully implemented until we ensure to bridge the gap of digital divide (a large number of people still have no access to technology and proper internet connectivity) in India Especially in rural areas. NSS 75th Round survey on "Household Social Consumption on Education in India" conducted during July 2017 to June 2018, revealed a picture where only 4% of rural households and 23% of urban households had computers. A total of 24% of the households in country agreed to have internet facility. Out of which 15% were rural households and 42% were urban households.
- Not only problem of digital divide exists in India but issue of gender digital divide can also be observed where females have less or no access to technology in comparison to males especially in rural areas.

- One of the major barriers for digital education is incapability of peoples to use technologies properly. People may have access to technology but unawareness and unwillingness towards proper handling of that technology often block the path for digital education.
- Digital education is provided through a virtual platform where teachers and students are virtually connected that resulted in lack of control on the environment of the class and behavior management of students by teachers.
- Shortage of trained teachers for conducting e-learning classes is major barrier for digitalization of education.
- Cultural diversity of India in terms of language demands the e-learning content and pedagogy available in different languages but technology limitations makes it hard to be accomplished. (As India is a multi-linguistic country which demands medium of instruction in different languages but technology limitations make it hard to be accomplished).
- Effectiveness of class, pedagogy can hardly be evaluated through virtual based digital classrooms.
- Availability of technology along with proper functionality is mandatory for digital learning that excludes the participation of poor students.

8. Conclusion

Technology has become an integral part of our modern lives, and is helpful in emerging the process of digitalization in all spheres of life. Digital initiatives taken by Government of India are transforming the traditional education system as well. These e-learning platforms are very effective in terms of availability of diverse range of courses and their significance in building one's skills and capabilities. It has bridged the gap between schools and homes as it is easily accessible and brought the transparency that can be easily monitored and hence making it reliable. The major question arises here is that are these digital initiatives are really accessible to different people belonging to different background or backward regions? Because availability of infra-structural facilities differs across whole India. Problem of digital divide and as well as of gender digital divide exist at a large scale. Therefore, not only access to electronic gadgets and technology should be ensured but also there is

need to train people to operate these technologies. Only complete digital literacy can reform digital learning process. Hence digitalization of education can't be successful until we ensure equal access to technology, electronic gadgets and proper training to operate these technologies.

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