Implementation of Digital Initiatives in Higher Education in India: Problems and Solutions

ABSTRACTS

The education system is gradually becoming technology-oriented. TheMinistry of Education of India has initiatives numerous digital platforms, tools, and devices like (SWAYAM, SWAYAMPrabha,Shodhganga,Shodhshuddhi, NDL, NAD, e-PG Pathshala, e-Yantra, FOSSE, SAMARTH, IRINS, spoken tutorials and Virtual Labs and so on) to ensure that everyone can access advance and quality education.The study exploresproblems and solutions regarding implementing digital initiatives in higher educational institutions. This study adopted secondary data from different papers published in journals, newspaper pieces, and various government policies and reports with the help of content analysis. Due to a lack of knowledge and awareness, many problems are faced in successfully implementing digital initiatives in India's higher Education. The problems encountered include limited digital resources and tools, poor internet connectivity in rural institutions, and a lack of proper policy guidelines and rules and regulations when implementing digital initiatives. This paper explores solutions to the problems regarding implementing digital initiatives, such as regular training and workshop programme arrangements that help to increase knowledge and awareness among academics, researchers, and students. Provide adequate internet infrastructure, especially in rural areas, and require sustainable funding to implement digital initiatives in higher Education successfully.The outcome will be highly beneficial if the students can learn digitally. It isvaluablefor faculty members to develop professional skills.

Keywords: Digital Initiatives, Higher Education, Ministry of Education, Digital Literacy

1.INTRODUCTION

Digital technology, to some extent, during the 1990s and 2000s, but remember that it was limited to a few higher education institutions in urban areas. However, the situation changed from the last years of the 2000s until the end of the 2010s. On November 20, 2004, India launched a massive satellite named Edusat, intending to revolutionise Education by delivering material and promoting ICT-based Education. This study presented an overview of the digital initiative launched by the government in 2015 to improve access and advance quality in higher Education. A few recommendations for their efficient adoption and utilisation to accomplish the benefits of these digital initiatives in a higher education institution. The Indian

government launched the 'Digital India' initiative in July 2015 to enhance online infrastructure and increment accessibility to the internet among all Indian citizens (Gawande, 2020). Campus Connectivity, Talk to a Teacher, Ask a Question, e-Acharya, e-Kalpa, FOSSEE (The Free and Open Source Software for Education), e-Vidwan, Spoken Tutorial, NAD (National Academic Depository), e-PG Pathshala, and other digital education tools are all part of the Ministry of Human Resource Development's (MHRD) major initiative, National Mission on Education through ICT (NMEICT) (Aggarwal, 2023). Department of Higher Education is putting into practice at various higher education institutions thirty Digital Initiatives that the Government of India has taken up. NCERT, UGC, CEC, IITs, NPTEL, NCERT, and NIOS are the sources of all study materials and contents(Green, 2013).

The concept of digital Education dates back to the 1950s when Indian radio and television were employed as mediums of instruction. It is not an entirely new process that has emerged overnight. NEP 1986 was amended in 1992 to emphasise the successful use of technology in Education to enhance quality, access, and governance (Mondal & Halder, 2020).The Indian government's initiatives to incentivise educators and learners to improve their pedagogical proficiency through digital learning.

1.2. RATIONALE OF THE STUDY

The study reveals that the traditional investment appraisal methods employed to evaluate digital assets are generally poorly received. (Kraus et al., 2024). They raise knowledge about the best ways to use digital initiatives in higher education and to assess how they're doing and how to improve a website's usability and motivation for using digital resources Because colleges are addressing the lack of resources when it comes to implementing digital projects in the classroom (Aggarwal, 2023). Technological Revolution. has aided in the faster, more efficient, and less expensive distribution of education, but unpredictable barriers to its continued delivery remain. In the future, it would be fascinating to see how these issues are handled (S. M. Gawande, 2020). Our poll revealed that 64.6% of participants were unhappy with online learning. 53.4% of the respondents, or more, use their phones for internet research. Only 28.8% of participants were attracted to online learning (Acharya et al., 2021). Digital initiatives are crucial and beneficial for expanding access and improving quality in higher education. Many problems are faced in India's higher education system (Ahmad, 2020). Appreciate the recent advancements in the digital education system that may benefit future generations (Agarwal, 2021)**.**Digital libraries offer users logical access to a vast, well-structured repository of information and knowledge. Users can access these libraries remotely (*Pandey*, 2014).

After reviewing many research studies, the researcher found several works on digital initiatives in higher educational institutions in India. Today's most significant number of people worldwide are aware of the importance of digital learning in all areas of Education. The digital learning platform provides an opportunity for lifelong learning. The outcome will be highly beneficial if the students can learn digitally. Therefore, a detailed study will be needed to study what digital initiatives have been implemented in

higher institutions and how much students, teachers, and administrators can use for their academic purposes.

2.DEFINITION OF THE KEY TERMS

2.1. Digital Initiative

The Indian government's Ministry of Education (MOE) has launched many digital initiatives for various educational goals, improving students' learning outcomes, professional development for faculty members and the ease of institutional administration and management. These are some examples. Multitudesof higher education institutions are implementing SWAYAM, SWAYAM, Prabha, NDL, NAD, e-PG Pathshala, e-Yantra, FOSSE, SAMARTH, IRINS, spoken tutorials and Virtual Labs and so on.

2.2. Higher Education

After higher secondary Education, it is considered higher education. Higher education refers to institutions that can run the UG PG and PhD programmes.

3.Research Question

3.1. What arethe status of digital initiatives in higher educational institutions taken by the Ministry of Education?

3.2. What are the problems regarding the implementation of digital initiatives?

3.3. What are the solutions to problems regarding digital initiatives?

4.Objectives of the Study

4.1. To know the status of digital initiatives in higher educational institutions taken by the Ministry of Education.

4. 2. To explore Problems regarding the implementation of digital initiatives.

4.3. To suggest solutions to the problems regarding implementing digital initiatives.

5.0. METHODOLOGY OF THE STUDY

Thisstudy adopted secondary data from different papers published in journals, newspaper pieces, and various government policies and reports with the help of content analysis.

6.0. DISCUSSION

Objective 1: Status of digital initiatives in higher educational institutions taken by the Ministry of Education.

The Indian government's Ministry of Education (MOE) has launched several digital initiatives for a range of educational goals like, improving students' learning outcomes, professional development for faculty members and the ease of institutional administration and management. are some examples. Many higher education institutions are implementing SWAYAM, SWAYAM, Prabha, NDL, NAD, e-PG Pathshala, e-Yantra, FOSSE, SAMARTH, IRINS,DIKSHA, spoken tutorials and Virtual Labs and so on. These are listed below, each with a brief description.

SWAYAM (STUDY WEBS OF ACTIVE LEARNING FOR YOUNG ASPIRING MINDS)

The three primary objectives of the Education Policy—equity, quality, and access—are to be achieved through the SWAYAM project, which the Indian government started.This endeavour aims to make the best educational resources accessible to all, even the most disadvantaged. SWAYAM aims to design digital infrastructure for students who are not yet impacted by the digital revolution and cannot enter the knowledge economy mainstream. All courses taught from Class 9 to post-graduation are to be hosted and accessed anytime, by anybody, anywhere. Exceeding 1000 carefully selected educators, experts and teachers from all over the nation have contributed to preparing these courses (Mondal & Halder, 2020).

SWAYAM course provides video lectures, readings that have been exceptionally prepared and can be printed or downloaded, quizzes and tests for self-assessment, and an online discussion forum for questions

SWAYAM PRABHA

SWAYAM PRABHA aims to deliver 32 top-notch educational channels nationwide via DTH (Direct to Home) 24 hours daily. The student will have the flexibility to select when to learn new material, which will be repeated six days a week for a minimum of four hours daily. Curricula in higher education include a range of subjects in the following areas: engineering, technology, performing arts, social sciences and humanities, science, music, law, medicine, and agriculture (Mondal & Halder, 2020).

National Programme on Technology Enhanced Learning (NPTEL)

"In 2003, the Indian Institute of Science in Bangalore and seven other Indian Institutes of Technology (Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati, and Roorkee) launched the National Programme on Technology Enhanced Learning" (NPTEL). NPTEL provides 235 web-based courses in mechanical engineering, computer science and engineering, electrical engineering, electronics and communication engineering, and civil engineering. Since March 2014, NPTEL has awarded certificates to individuals who successfully finish the online courses.

National Digital Library of India (NDLI)

These initiatives edge the appropriate material, federated and filtered searching. Learners can easily access the proper resources in a minimum amount of time. Leading vernacular languages, including Bengali, Hindi, and others, are supported via the NDLI interface, which may hold material in any language. All academic levels—including researchers and lifelong learners—as well as all disciplines, popular access devices, and learners with disabilities, are intended to receive support from it (Gawande, 2020).

National Academic Depository (NAD)

The Ministry of Human Resources Development, Government of India (MHRD) launched the National Academic Depository (NAD) as a way to make it easier to digitally issue, save, access, and verify academic awards that academic institutions issue. NAD is an original, creative, and forward-thinking project centred around the "Digital India" idea that aims to empower educational records digitally. The goal of NAD is to bring the concept of providing every Indian with a digital academic certificate to reality. The youth of India are impacted by this and are given access to Digital, Online, Trusted, and Verifiable Certificates that may be accessed securely at all times. NAD pledges to eliminate the challenges or inefficiencies associated with gathering, preserving, and presenting actual paper certificates (Gawande, 2020).

Virtual Labs

IIT Delhi is the coordinating institution for this initiative, a cooperative operation that includes twelve collaborating institutes. It represents a paradigm change in Education using ICT. We are using this kind of effort in distant experiments for the first time. The Virtual Labs effort produced over 100 Virtual Labs with over 700 web-enabled experiments designed for remote operation and observation.

Talk to a Teacher

"Talk to a Teacher" was developed by IIT Bombay as a project of the MHRD-funded National Mission on Education through ICT. It provides free access to a select number of graduate and postgraduate courses taught by respected IIT Bombay faculty members and researchers. It is the use of the cooperative tool. More than 80,000 instructors have received Education through this program, which involves synchronous delivery of courses from IIT Mumbai and IIT Kharagpur (Gawande, 2020).

E-ShodhSindhu

The goal of the government program is to give academic institutions access to high-quality online resources, such as accurate, full-text, and bibliographic databases, at a reduced subscription cost.

E-Yantra

The purpose of "e-Yantra," a robotics integration tool for engineering education, is to captivate students with compelling real-world applications of computer science, engineering, and mathematics principles. We successfully proved the robotic platform development during the project's phase. There are presently 100 colleges using E-Yantra (Gawande, 2020).

Campus Connectivity

Under NMEICT, we established one gigabit per second of campus connectivity and twenty 512 Kbps broadband connections to colleges.". As of now, 600 universities are connected by 1 Gbps optical fibre, and 22026 colleges have 10 Mbps broadband. As part of the PMO's "Digital India" initiative, the MHRD has recently been permitted to install Wi-Fi on university campuses with a 1 Gbps bandwidth.

E-KALPA

e-Kalpa is another MHRD/NMEICT effort used in India to develop a digital learning environment for design. This project combines the development of e-learning modules with online learning software.

E-VIDWA

The goals of VIDWAN are to Assemble research and academic biographies of researchers, professors, and academics employed by eminent research and educational institutions in India and elsewhere; Select peer reviewers to assess research proposals and articles; and Provide resources so that scientists may network and exchange information (Mondal & Halder, 2020).

E-PG Pathshala

Under the 'National Mission on Education through ICT', 'MHRD' launched this initiative. UGC was in charge of carrying out this project. They primarily concentrated on the curriculum and essential elements of the educational system. Curriculum-based, interactive, high-quality e-content in 70 subjects, including the arts, fine arts, social sciences, humanities, linguistics and language, and natural and mathematical sciences, has been created by subject matter experts from Indian universities and research and development centres across the country (Gawande, 2020).

Objective 2: Problems regarding the implementation of digital initiatives

The problems encountered include limited digital resources and tools, poor internet connectivity in rural institutions, and a lack of proper policy guidelines, rules and regulations when implementing digital initiatives (Acharya et al., 2021). There is a lack of adequate policy guidelines, rules, and regulations for implementing digital initiatives in higher Education, and there are no guidelines for intellectual property rights for producing digital information content (Akhan et al.,2023). Inconsistent electricity is a crucial barrier to digital initiatives; insufficient instruction and knowledge on efficient use of technology among

students, faculty, and support staff hinders the effective implementation of digital initiatives (*Satya Nand Pandey*, 2014). Some teachers and students are not interested in change.

The researcher discovered many issues after reviewing the numerous research studies. Several studies noted innumerable problems with adopting digital initiatives in higher Education. Researchers conclude the abovementioned issues, including a lack of acceptable legislative guidelines and regulations, insufficient funding, inappropriate infrastructure unsuitable for digital projects, and a lack of awareness and understanding.

Objective 3: Suggestions for the solutions of problems regarding digital initiatives

The study identifies potential approaches for offering thorough details regarding digital efforts. Academics, researchers, and students must be more aware of this (Aggarwal, 2023). Requirement sustainable funding for the successful implementation of digital initiatives in higher educational institutions in India (Acharya et al., 2021). Design robust and Scalable Learning Management Systems (LMS) customised to successfully implement digital initiatives in higher educational institutions. More digital literacy programs are needed, especially in rural areas, for effective implementation of digital initiatives in higher educational institutions (Acharya et al., 2021). Regular training and workshop programme arrangements can develop students, faculty members and administrators' awareness of digital tools and devices (Stork, 2018).Many teachers need support to utilising digital teaching practices (Melnyk et al., 2023).

After reviewing the many research studies, the researcher suggests solutions to the problems regarding implementing digital initiatives in higher education institutions in India. Practical implementations of digital initiatives need sustainable funding design and robust and Scalable Learning Management Systems (LMS). Regular training and workshops programmed arrangement can develop awareness among students, faculty members and administrators and provision of adequate internet infrastructure, especially in rural areas.

7.0. Practical Implications

This paper helps understand the concept and current state of digital efforts and problems and solutions regarding implementing digital initiatives in higher education institutions.Educational institutions should prioritise high-speed internet, contemporary computer laboratories, and cutting-edge digital learning platforms. This review paperprovides direction on how to develop digital infrastructure in institutions.

8.0. CONCLUSION

To create more accessible and high-quality "higher education," as well as better tools for certifying and rating educational institutions, the Department of Higher Education is implementing thirty Digital Initiatives at various higher education institutions. This analytical study has offered a thorough analysis of the digital activities in Indian higher education institutions, highlighting important issues and suggesting workable

solutions. Digital reforms demonstrate how India and its states have recognised the opportunities and difficulties of the twenty-first century, the power of information, technology, and creativity, and the drastic changes taking place in the country (Gawande, 2020). Insufficient instruction and knowledge of the efficient use of technology among students, faculty, and support staff hinder the successful implementation of digital initiatives. How we handle these issues in the future will be fascinating. Additionally, these initiatives provide insight to the students prepare for the workforce by assisting them to acquire employable digital competencies and skills.Furthermore, professional development and teacher training initiatives are essential to utilising digital tools in the classroom.

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Details of the AI usage are given below:

1.Grammarly

2.Quillbot

3.

REFERENCES

1. Acharya, A., Subedi, S., Gyawali, N., Poudyal, N., Lamichhane, G., Bastola, G., Aryal, B., Bhattarai, B. R., Adhikari, B., Marahatha, R., Bhatta, M., Paudel, M., & Parajuli, N.

(2021). Digital learning Initiatives, Challenges and Achievement in Higher Education in Nepal Amidst COVID-19. *International Journal of Asian Education*, *2*(3). https://doi.org/10.46966/ijae.v2i3.224

2. Agarwal, R. K. (2021). Digital Education in India: Scope and Challenges. *International Journal of Advanced Research in Commerce, Management & Social Science*, *4*(2), 99–104.
3. Aggarwal, S., & Chimni, N. (2023). Use And Status of Higher Educational Digital Initiatives In University: A Webometric Analysis. *Journal of Indian Library Association*, *59*(2), 1–14.
4. Ahmad, S. (2020). Digital Initiatives for Access and Quality in Higher Education: An Overview. *Prabandhan: Indian Journal of Management*, *13*(1), Article 1. https://doi.org/10.17010/pijom/2020/v13i1/149944
5. Akhan, J. A., Nahar, N., Dey, A., &NathSaha, D. H. (2023). *Digital Initiatives in Higher Education in India*.
6. Singh, A. (2019). ICT initiatives in School Education of India. *Indian Journal of Educational technology*, *1*(1), 38-49.
7. Bengs, A., MacDonald, C., Cassar, M., Yeratziotis, A., Geratziotis, G., Prosen, M., Cilia, J., Granberg, A., Papadopoulos, G. A., & Ličen, S. (2023). *Teaching Online: Digital Initiatives in Digital Education and Mobile Learning*. 2794–2804. https://doi.org/10.21125/inted.2023.0771
8. Dang, L. P. H. (2023). Exploring the Relationship Between Digital Initiatives, Dynamic Capabilities and Market Performance: A Conceptual Framework. In R. Sharma, A. Shishodia, & A. Gupta (Eds.), *Fostering Sustainable Development in the Age of*

Technologies (pp. 113–128). Emerald Publishing Limited. https://doi.org/10.1108/978-1-83753-060-120231010

9. *Department of Higher Education | Government of India, Ministry of Education*. (2017). Retrieved July 18, 2024, from https://www.education.gov.in/ict-initiatives
10. *Digital ICT Initiatives_MHRD.pdf*. (2021). Retrieved July 18, 2024, from https://gndec.ac.in/sites/default/files/Digital%20ICT%20Initiatives_MHRD.pdf
11. Fernández, A., Gómez, B., Binjaku, K., &Meçe, E. K. (2023). Digital transformation initiatives in higher education institutions: A multivocal literature review. *Education and Information Technologies*, *28*(10), 12351–12382. https://doi.org/10.1007/s10639-022-11544-0
12. Furjan, M. T., Tomičić-Pupek, K., & Pihir, I. (2020). Understanding Digital Transformation Initiatives: Case Studies Analysis. *Business Systems Research Journal*, *11*(1), 125–141. https://doi.org/10.2478/bsrj-2020-0009
13. Gawande, S. (2023). *Digital Initiatives for Higher Education in India: A Technological Revolution*.
14. Gollner, A., Köster, M., Nicklin, P., Trieselmann, T., Klein, E., Vlach, J., Heine, C., Grundl, M., Ramharter, J., Wyatt, D., Chaturvedi, M., Ciulli, A., Carter, K., Müller, S., Bischoff, D., Ettmayer, P., Haaksma, E., Mack, J., McConnell, D., & Montel, F. (2022). opnMe.com: A digital initiative for sharing tools with the biomedical research community. *Nature Reviews Drug Discovery*, *21*. https://doi.org/10.1038/d41573-022-00071-9

15. Green, K. C. (2013). Massive Open Online Courses (MOOCs) and Other Digital Initiatives. *Journal of Collective Bargaining in the Academy*, *8.* https://doi.org/10.58188/1941-8043.1299
16. Gurram, S. (2008). *Digital library initiatives in India: A proposal for open distance learning*.
17. Jerome, D. V. B. (2023). *Digital India A Progress towards Sustainable Development Goals (SDGs)*. kitab writing publication.
18. Jöhnk, J., Oesterle, S., Ollig, P., & Riedel, L.-N. (2020, February 9). The Complexity of Digital Transformation – Conceptualizing Multiple Concurrent Initiatives. *WI2020 Zentrale Tracks*. 15th International Conference on Wirtschaftsinformatik (WI), Potsdam, Germany. https://doi.org/10.30844/wi_2020_j8-joehnk
19. Kraus, P., Kappl, J., & Schlegel, D. (2024). To invest or not to invest in digital initiatives? An exploratory examination of procedures, evaluation criteria and barriers. *Digital Transformation and Society*. https://doi.org/10.1108/DTS-02-2024-0004
20. Melnyk, M., Blyznyukov, A., &Cieślik, J. (2023). The impact of digital education initiatives. *SocioEconomic Challenges*, *7*(3), 1–9. https://doi.org/10.61093/sec.7(3).1-9.2023
21. Mondal, A., & Halder, A. (2020). Digital Initiatives in Higher Education in India. *Journal of Educational Research and Extension*, *57*(4), 36–41.
22. Olofsson, A. D., Fransson, G., & Lindberg, J. O. (2020). A study of the use of digital technology and its conditions with a view to understanding what 'adequate digital competence' may mean in a national policy initiative. *Educational Studies*, *46*(6), 727–743. https://doi.org/10.1080/03055698.2019.1651694

23. Pandey, S. N. (2014). *A Study of Digital Library Architecture and Problems Of Digital Initiatives In Indian Libraries*. *3*(2).

24. Piccoli, G., Rodriguez, J., & Grover, V. (2020). *Strategic Initiatives and Digital Resources: Construct Definition and Future Research Directions*.

25. *Review of national policy initiatives in support of digital and AI-driven innovation* (OECD Science, Technology and Industry Policy Papers 79; OECD Science, Technology and Industry Policy Papers, Vol. 79). (2019). https://doi.org/10.1787/15491174-en

26. Spears, B. A. (2013). A review of initiatives using technology to promote cyber-safety and digital citizenship. *The Impact of Technology on Relationships in Educational Settings*, 188–203.

27. Stork, M. G. (2018). Implementing a Digital Learning Initiative: A Case Study in K-12 Classrooms. *Journal of Formative Design in Learning*, *2*(1), 36–48. https://doi.org/10.1007/s41686-017-0013-1

28. Tunga, S. K. (2023). *Digital Initiatives in Higher Education: Strategies Role of Academic Libraries and LIS Professionals*. International Conference on Recent Trends in Information Management: Issues and Challenges (ICRTIM 2023).

29. Valentino, M. (2020). *Digital Initiatives Report 2019-2020*.Scholar Works Reports

30. Venkatesh, V., & Sykes, T. A. (2013). Digital Divide Initiative Success in Developing Countries: A Longitudinal Field Study in a Village in India. *Information Systems Research*, *24*(2), 239–260. https://doi.org/10.1287/isre.1110.0409

31. Wang, X., Li, Y., Tian, L., & Hou, Y. (2023). Government digital initiatives and firm digital innovation: Evidence from China. *Technovation*, *119*, 102545. https://doi.org/10.1016/j.technovation.2022.102545

32. Williams, D. (2021). *Co-Governance in Digital Transformation Initiatives: The Roles of Digital Culture and Employee Experience*. Hawaii International Conference on System Sciences. https://doi.org/10.24251/HICSS.2021.704

33. Williams, D. J. (2023). Digital Initiatives in Academic Libraries: Challenges and Opportunities. *Portal: Libraries and the Academy*, *23*(2), 387–398. https://doi.org/10.1353/pla.2023.0015

34. Zorich, D. M. (2003). *A survey of digital cultural heritage initiatives and their sustainability concerns*. Council on Library and Information Resources.