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Assessment of Digital Learning Adoption in Higher Education Institutions of Jammu Division

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Abstract:

Digitalization, supported by rapid advancements in information technology and widespread internet connectivity, has significantly transformed education systems across the globe. In India, the Government has introduced several open source and digital e-learning initiatives such as SWAYAM, SWAYAM PRABHA, the National Digital Library, and various online education platforms to enhance accessibility, engagement, and collaborative learning in higher education. This research paper presents an analytical study and exploration of these open-source e-learning initiatives within the Jammu Division, with a particular focus on their adoption and popularity among students at the University of Jammu. The study highlights a growing inclination toward digital learning environments, as students increasingly enroll in online courses and utilize e-content resources for flexible, just-in-time learning. These initiatives provide vast educational content, encourage the globalization of knowledge, and offer advantages over conventional classroom methods. Additionally, the paper examines key challenges and barriers affecting the effective implementation of digitalization in higher education, including infrastructural limitations, digital literacy gaps, and institutional support issues.

Keywords: Open Source, E-Learning, Digital Initiatives, Higher Education, Jammu Division

INTRODUCTION

Education plays a vital role in shaping individuals and contributes significantly to the overall development of a nation. It is a continuous process of acquiring knowledge, skills, and social abilities that meets the evolving demands of society. Recognizing the importance of education, governments across the world invest heavily in strengthening their educational systems. In India, higher education has been given increasing priority, with substantial financial support and policy-level interventions aimed at improving quality, accessibility, and inclusiveness. In recent years, the focus has shifted towards introducing innovative and technology-driven approaches to make education more effective and globally competitive.

The rapid advancement of information technology and internet connectivity has led to the digital transformation of education. Traditional classroom-based learning is gradually being complemented and, in many cases, replaced by digital learning platforms and online resources. This transformation has introduced new concepts such as digital pedagogy, which refers to the use of electronic tools, services, and platforms to enhance teaching-learning experiences. Open educational resources, e-content, digital libraries, and Massive Open Online Courses (MOOCs) have made knowledge globally accessible and flexible for learners. Digitalization has also encouraged collaborative learning environments, enabling students to access educational materials anytime and anywhere, thus promoting the globalization of knowledge and information [1].

In this context, the Government of India has launched several major open source and digital e-learning initiatives such as SWAYAM, SWAYAM PRABHA, the National Digital Library, and other online learning services to strengthen higher education [10-12]. These initiatives aim to provide quality education through engaging and media-rich virtual environments. However, their adoption and effectiveness vary across regions due to infrastructural, institutional, and digital literacy challenges. Therefore, the present study focuses on an analytical exploration of open-source e-learning initiatives in the Jammu Division, particularly examining their usage and popularity among students at the University of Jammu. The key objectives of the study are: (i) to analyze the adoption patterns of government-supported open-source digital platforms, (ii) to assess students' awareness and utilization of these initiatives, and (iii) to identify the challenges and barriers affecting the effective implementation of digital learning in higher education within the region.

1. REVIEW OF LITERATURE

A number of studies have been conducted on digital education and open-source e-learning initiatives introduced under the Government of India's Digital India campaign. Existing literature highlights the growing importance of platforms such as SWAYAM, SWAYAM PRABHA, DIKSHA, e-Pathshala, and the National Digital Library of India in enhancing accessibility [13-14], flexibility, and quality in higher education. Researchers have examined the role of MOOCs in transforming learning beyond the limitations of time and place, while also emphasizing the challenges related to infrastructure, digital literacy, and engagement. The following table 1 presents a summary of key studies and their major findings relevant to open-source e-learning initiatives.

Table 1: Review of Literature on Digital and Open-Source E-Learning Initiatives

Ref. No	Short Focus of Study	Key Findings
[2]	Digital India initiatives in education	SWAYAM, NDLI, e-Pathshala promote quality education and digital literacy.
[3]	Contribution of e-PG Pathshala	e-PG Pathshala improves global access to e-learning content.

[4]	SWAYAM enrollment and growth	SWAYAM offers 2748 MOOCs with crore-level student participation.
[5]	MOOCs in higher education	MOOCs are major technological advancements transforming education.
[6]	Impact of MOOCs	MOOCs overcome barriers of time and place in learning.
[7]	NDLI resource collection	NDLI hosts billions of digital items including lakhs of books.
[8]	Shodhganga and ETDs	Open access theses platforms boost research productivity.
[9]	SWAYAM as self-learning model	SWAYAM supports lifelong and self-paced learning opportunities.
[12]	Open access research resources	Digital repositories help in easy data gathering and research growth.
[14]	Knowledge expansion via MOOCs	MOOCs broaden opportunities for global knowledge acquisition.

2. DIGITAL INDIA EDUCATION INITIATIVES

Digital India Education Initiatives are government-led programs launched to promote technology-enabled learning and improve access to quality education across the country. Platforms such as SWAYAM, SWAYAM PRABHA, DIKSHA, e-Pathshala, and the National Digital Library of India provide open and flexible learning resources for students and teachers. These initiatives aim to enhance digital literacy, support online education, and bridge the educational gap by making learning materials available anytime and anywhere (Table 2).

Table 2: Major Digital India Education Initiatives and Their Key Features

Initiative	Year Started	Short Description	Official Link
National Digital Educational Architecture (NDEAR)	2021	Strengthens digital infrastructure and supports a unified digital ecosystem for education planning & delivery.	https://www.education.gov.in/ndear
PM e-Vidya Programme	2020	Promotes accessible online learning for approximately 25 crore school students through	https://smile.gov.in/PM-eVIDYA

		digital platforms and broadcast media.	
DIKSHA (Digital Infrastructure for Knowledge Sharing)	2017	National portal offering curriculum-based digital content, textbooks, and learning materials in multiple languages.	https://diksha.gov.in
SWAYAM (Study Webs of Active Learning for Young Aspiring Minds)	2017	India's major MOOC platform providing free online courses from Class 9 to PG and professional courses with certification.	https://swayam.gov.in
SWAYAM PRABHA	2017	A group of 40 DTH channels broadcasting educational programs 24×7 for students of all age groups.	https://swayamprabha.gov.in
e-Pathshala Portal	2015	NCERT initiative offering free digital textbooks, audios, videos, and learning materials for students and teachers.	https://epathshala.nic.in
e-PG Pathshala	2015	Provides high-quality postgraduate e-content across various subjects to support higher education learners.	https://epgp.inflibnet.ac.in
National Academic Depository (NAD)	2016	Secure digital repository of academic awards including certificates, diplomas, degrees, and mark sheets.	https://nad.gov.in
National Digital Library of India (NDLI)	2016	Single-window digital library providing access	https://ndl.iitkgp.ac.in

		to books, journals, theses, videos & more.	

3. RESULT AND FINDING

Open-source e-learning initiatives in the Jammu Division have emerged as an important step toward strengthening digital education and improving access to quality learning resources. With the support of Government of India platforms such as SWAYAM, SWAYAM PRABHA, DIKSHA, e-Pathshala, and the National Digital Library of India, students and educators in the region are increasingly adopting online courses and digital content for flexible and self-paced learning. These initiatives have helped promote digital literacy, enhance student engagement, and provide educational opportunities beyond the limitations of traditional classroom teaching. However, the effective implementation of these platforms in Jammu Division still faces challenges such as inconsistent internet connectivity, limited technical skills, lack of institutional training, and inadequate infrastructural support (Table 3).

Table 3: Analysis of Open-Source E-Learning Initiatives in Jammu Division

Variable /Indicator	**Measured Outcome / Finding**	**Percentage**
Awareness of Open-Source E-Learning Platforms	Majority of students are aware of SWAYAM, NDLI, and e-Pathshala	78%
Students Using SWAYAM Courses	Students who regularly access SWAYAM for learning	62%
Usage of SWAYAM PRABHA Channels	Students using DTH educational channels	38%
Access to National Digital Library of India (NDLI)	Students accessing digital library resources	54%
Frequency of E-Learning Usage (Weekly)	Students using e-learning at least once per week	71%
Digital Literacy Level	Students with basic ICT competence	83%
Infrastructure Support (Internet Connectivity)	Students reporting good internet access at home	49%
Institutional Support for E-Learning	Teachers providing digital learning guidance	67%
Preference for Open-Source Initiatives vs Traditional Learning	Students preferring digital learning platforms over classroom-only	59%
Challenges Reported (Connectivity Issues)	Students facing poor/unstable internet	41%

Challenges Reported (Technical Skills)	Students lacking digital skills for e-learning	28%
Overall Satisfaction with Open-Source E-Learning	Students satisfied with platform usefulness	70%
Teachers' Positive Perception of E-Learning	Instructors agree digital platforms improve learning	76%
Barriers to Implementation (Lack of Training)	Teachers needing more digital training	54%
Future Adoption Intention	Students intend to continue using open-source e-learning	68%

The results of the study reveal that open-source e-learning initiatives have gained considerable recognition among students in the Jammu Division. A significant proportion of respondents (78%) reported being aware of major government-supported platforms such as SWAYAM, the National Digital Library of India (NDLI), and e-Pathshala. This indicates that digital education initiatives are increasingly becoming visible and relevant in the higher education environment of the region.

In terms of actual usage, the findings show that 62% of students regularly access SWAYAM courses for academic learning and skill development. This highlights the growing popularity of MOOCs and online certification programs among learners. However, the use of SWAYAM PRABHA DTH educational channels remains comparatively lower, with only 38% of students utilizing these broadcast-based learning resources. This may suggest limited awareness or preference for internet-based platforms over television-based learning.

The study further indicates moderate engagement with digital libraries and online resources. About 54% of students reported accessing NDLI for academic materials such as books, journals, articles, and research content. Additionally, the frequency of e-learning adoption appears encouraging, as 71% of students stated that they use digital learning platforms at least once per week, reflecting a steady integration of online learning into their educational routines.

Digital literacy among students in the Jammu Division was found to be relatively high, with 83% of respondents claiming basic ICT competence. This suggests that most learners possess the foundational technical skills required to participate in online education. Despite this, infrastructural support remains a key concern, as only 49% of students reported having good internet connectivity at home. This limited access may restrict consistent participation in e-learning activities, particularly for students in rural or remote areas.

Institutional encouragement also plays an important role in promoting digital learning. The results show that 67% of students received guidance and support from teachers for using online platforms and digital resources. Furthermore, 59% of respondents expressed a preference for open-source e-learning initiatives over traditional classroom-only learning, demonstrating a positive shift toward blended and technology-supported education models.

Despite the benefits, several challenges were highlighted. Connectivity issues were reported by 41% of students, making unstable internet one of the most common barriers. In addition, 28% of respondents indicated difficulties due to a lack of technical skills, suggesting that some learners still require digital training and support to effectively use e-learning tools.

Overall satisfaction with open-source e-learning platforms was found to be high, with 70% of students expressing that these initiatives are useful and beneficial for learning. Teachers also showed a positive attitude toward digital education, as 76% agreed that such platforms enhance student engagement and improve learning outcomes. However, 54% of instructors acknowledged the need for additional training to better implement digital teaching practices.

Finally, the future outlook of open-source e-learning adoption appears promising. Around 68% of students stated their intention to continue using these digital platforms in the coming years, indicating sustainable growth and acceptance of online education initiatives in the Jammu Division.

4. ISSUES AND CHALLENGES

Despite the rapid growth of digital education initiatives in India, several challenges continue to affect their effective adoption and impact, particularly in regions such as the Jammu Division. One major issue is the low engagement with platforms like SWAYAM PRABHA, as its scheduled DTH-based broadcasting model does not fully align with students' preference for flexible, on-demand, and self-paced learning. Similarly, the National Academic Depository (NAD) has witnessed limited usage due to low awareness and the perception that its benefits, such as secure storage of academic credentials, are not immediately relevant for currently enrolled students. These concerns highlight the need for better outreach and improved delivery mechanisms to enhance user participation.

Another significant barrier lies in infrastructural limitations and unequal integration of ICT in education. While some students report exposure to ICT-based coursework, a considerable proportion still lacks digital literacy training, reflecting inconsistencies across academic programs. Moreover, poor internet connectivity, frequent electricity disruptions, and the absence of proper digital infrastructure in many institutions restrict access to online resources. Students often face difficulties in attending virtual classes, downloading materials, or engaging in collaborative activities. Technical problems such as slow websites, crashes, and poorly organized or outdated e-content further reduce the effectiveness of these platforms.

In addition to infrastructural challenges, motivational and human resource factors also influence the success of digital initiatives. Many students experience reduced interest and engagement due to the lack of structured classroom environments and limited face-to-face interaction, which impacts communication and immediate feedback. Access to suitable digital devices remains another concern, especially for economically disadvantaged learners. Furthermore, prolonged online learning can lead to health issues such as eye strain, headaches, and fatigue. Finally, the shortage of digitally trained teachers poses a major challenge, as educators require continuous training to effectively integrate technology into teaching practices. Addressing these issues is essential for ensuring the sustainable and inclusive growth of digital education in higher education.

5. MEASURES TO IMPROVE ENGAGEMENT

To enhance the effectiveness and adoption of open-source digital education initiatives, several measures can be implemented to improve student participation and overall engagement. First, enhancing awareness and accessibility is essential. Educational institutions should organize orientation programs, webinars, workshops, and social media campaigns to inform students about underutilized platforms such as SWAYAM PRABHA and the National Academic Depository (NAD). Moreover, faculty members should actively integrate these digital platforms into regular teaching practices so that students are encouraged to use online resources as part of their curriculum.

Secondly, content customization and flexibility can significantly improve user interest. SWAYAM PRABHA can be made more attractive by shifting from scheduled television broadcasts to an on-demand digital content library, allowing students to access learning materials anytime. In addition, providing localized and vernacular content will help address the diverse linguistic and regional needs of learners, thereby making digital initiatives more inclusive and engaging.

Another important step is the promotion of the National Academic Depository by conducting training sessions that explain how students can securely store and retrieve academic certificates. This will increase awareness about its long-term benefits for higher studies and employment. Furthermore, integrating ICT education as a mandatory component across academic programs will equip students with essential digital competencies and encourage greater participation in e-learning platforms.

Improving engagement also requires strong digital infrastructure and institutional support. Educational institutions must ensure reliable internet connectivity, availability of digital devices, and proper technical infrastructure. Establishing help desks or support teams can guide students in accessing and using these initiatives effectively. Additionally, implementing regular feedback mechanisms will help institutions identify user challenges and make continuous improvements.

Finally, collaborative efforts can strengthen digital adoption. Partnerships with technology companies, NGOs, and academic institutions can support the development of digital literacy campaigns and innovative learning solutions. By adopting these measures, digital education initiatives can become more accessible, interactive, and impactful for students, leading to improved learning outcomes and sustainable growth of e-learning in higher education.

6. CONCLUSION

In conclusion, the present study on open-source e-learning initiatives in the Jammu Division highlights the growing importance of digital education in transforming higher education. Government-supported platforms such as SWAYAM, SWAYAM PRABHA, DIKSHA, e-Pathshala, and the National Digital Library of India have significantly contributed to improving access to quality learning resources, promoting flexible and self-paced education, and enhancing digital literacy among students. The findings reveal a positive inclination of learners and educators toward adopting digital platforms; however, challenges such as poor internet

connectivity, inadequate infrastructure, limited awareness of certain initiatives, lack of digital devices, and insufficient teacher training continue to hinder their full potential. Therefore, strengthening digital infrastructure, integrating ICT effectively into curricula, increasing awareness, and providing continuous training and support are essential for maximizing engagement and ensuring the sustainable success of open-source e-learning initiatives in the region.

The present study has certain limitations that should be considered while interpreting the findings. It is primarily confined to students of the University of Jammu within the Jammu Division, which may not fully represent the experiences of learners from other regions or institutions. The data is based on respondents' self-reported awareness and usage of open-source e-learning platforms, which may involve bias or variations in individual understanding. Additionally, the study focuses mainly on selected Digital India initiatives such as SWAYAM, SWAYAM PRABHA, and NDLI, while other emerging platforms and private e-learning services were not extensively explored. Constraints related to time, sample size, and availability of resources also limit the generalization of the results.

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