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Efficacy of Digital Initiatives in Higher Education System

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Abstract

Technology has become an integral part of education system. Now technology becomes a crucial component of teaching-learning process. Digital initiatives are the remarkable step towards achieving the goals related to education system. It helps in meeting the future needs of the teachers, students and administrators (stakeholders). By imparting digital initiative or ICT applications in the education system, India will be able to achieve the goal of modernization of society by modernizing the institutes. Digital changes are the revolutionary step for bringing an auspicious development in higher education institutes. For the present study, objectives are:i) to study the digital initiatives used by the students of University of Jammu, ii) to study the efficacy of digital initiatives used by the students of University of Jammu, and iii) to obtain suggestions from students of University of Jammu for improvement of digital components. Data were collected from 200 post graduate students of University of Jammu to identify the various digital initiatives undertaken by them and also study the efficacy of these digital initiatives which is initiated by the Government of India at higher education level. These digital initiatives include SWAYAM, SWAYAM Prabha, National Digital Library of India (NDLI), online education, e-PG Pathshala, e-Shodhganga, National Academic Depository (NAD), ICT Labs etc. This study also focused on the various problems that students faced while using such digital initiatives in their education process.

Keywords: *Digital Initiatives, Digitalisation, Higher Education, Efficacy.*

Introduction

Education is the tool in the hand of people that helps in moulding the intellectual level of anyone and improves the overall personality of the individual. It is a process of embedding student with intellectual, moral and social aspects. It is fundamental aspect for getting full potential of human being, promoting equitable society, developing responsible citizen for a nation who helps in promoting the national development and make a prosperous nation. In India, education system is always in a top priority. Government of India works at his best to achieve the goals and objectives of the education system. The 21st century education system demands a new aspect, revision and revamping the whole structure of education in order to build the India's traditions and value system in a sustainable way (Goyal,

2024). Each level of education that is primary level, secondary level and higher level needs a blow of modernity with new means, methods and ways of teaching-learning process.

In higher education, improvement is required for overall development of students. There is a huge gap between the learning outcomes and what is required in modern era. In the era of science and technology, it becomes very important to equip the institutes with technology in order to cope with the fast-changing world, dictated by the advancement of the technology (Cohen et al., 2022). Government's efforts of improving higher education are in great speed. New and relevant courses are developed. New innovative ideas are implemented in making education effective in nature. These innovative ideas are mostly accompanied by the digitally means. New technology interventions have been used for improving the teaching-learning process like assessing the outcomes of education, helping the teacher for their lesson plans, better assessment and evaluation, proper management, planning, administration, attendance, admission process etc.

The use of technology in education is referred to as the digital transformation of education. With the aid of technology, the traditional system of education has gradually and very smoothly transformed into a digital one (Raja & Nagasur bramani, 2018). Technology has become an integral part of education system. Initially seen as an addition to education, but now technology becomes a crucial component of it. However, the transition from a traditional to a digital education system was not easy. It had taken decades to build a suitable system, which inspires users and trains employees to accept the new up-gradation. In 1930, the British Broadcasting Corporation (BBC) broadcast the first educational and cultural programme through broadcasting radio and All India Radio in 1937 broadcasted first educational programmes for pupils in school (Sarmah & Lama, 2017). Moreover, the introduction of television and its adoption as an informational medium led to the emergence of educational television for students of secondary school in 1961. In 1984, computer education was started with the vision of Computer Literacy and Studies in School (CLASS). Instead of these initial initiatives, Information and Library Network Centre (INFLIBNET) in 1991 and National Mission on Education through Information and Communication Technology (NMEICT) in 2009 were considered as a major initiative in the field of digitalization of the education (India Report Digital Education, 2021). After this, there is an exponential development of technology in the field of education has been seen in India. The emergence of Educational Satellite (Edusat), a dedicated satellite for education, contributed to the rise of telecasts with the interactive feature of EDUSAT transmissions. With the passage of time, popularity of technology in education increased. Role and responsibility of teacher have also changed from traditional teacher to technology oriented (Grover & Naik, 2021).

Digital initiatives are the remarkable step towards achieving the goals of modernisation of education system. It helps in meeting the future needs of the teachers, students and administrators (stake holders).

By imparting digital initiative or ICT applications in the education system, India will be able to achieve the goal of modernization of society by modernizing the institutes. Digital changes are the revolutionary step for bringing an auspicious development in higher education institutes. The Ministry of Human Resource Development (MHRD) has launched a number of programmes to help students and teachers overcome the difficulties of remote learning. Platforms like e-PG Pathshala, SWAYAM, Swayam Prabha, e-Shodhganga, National Digital Library of India, National Academic Depository, e-Shodhsindhu, GIAN, the National Repository of Open Educational Resources (NROER) etc. are some of the digital initiatives that are started by the govt. of India for providing instructional materials and pertinent training to teachers and students across the nation. ICT tools like radio and television help the government reach more target groups

To optimize educational attainment, educational institutions should look beyond the conventional confines of classroom instruction by combining modern technology with all pedagogical approaches (Marie & Nagaraju, 2024). For the successful implementation of digital initiatives, awareness of ICT tools and resources (Bordoloi et al, 2024) is important for the proper utilization of technology in teaching-learning process (Mokhtari, 2023). Knowledge related to use of smartphone and computers, use of digital platform, awareness about online platforms and resources among students and teachers are prerequisite for proper implementation of digital initiative in general classrooms.

Digital Education and Its Evolving Trends across the World

Due to the surge of the pandemic in 2020, nearly 1.6 billion children were impacted by the temporary closure of schools in 194 countries as of early April 2020, according to UNESCO. Through the use of Information and Communication Technology (ICT), digital education has advanced rapidly and, as a result, revolutionized traditional educational systems worldwide. In response to the global acceleration of digital transformation, many nations and international organizations have implemented digital education reform policies, elevating digital education to the level of national strategy and encouraging its development and reform. Numerous reports, policy frameworks, and strategies have been released by both developed and developing countries, with a primary focus on the proper implementation of the digital components in education system.

In 2019, the German federal government formally introduced the Digital Agreement for Schools. In August 2021, the Chinese Ministry of Education designated Shanghai as a pilot zone for digital education transformation. The Digital Education Action Plan (2021–2027), published by the EU, identifies major concerns related to digital education that need to be promoted at the EU level. In September 2020, UNESCO and UNICEF jointly released a report on digital connectivity in education.

Australia's National Curriculum encourages all students to learn digital literacy and technology, ensuring on-going involvement from Foundation to Year 8 or 10. The Digital Literacy Capability

emphasizes that digital literacy is an essential skill that should be taught across all learning areas, in alignment with the Australian Technologies Learning Area Curriculum, which recognizes technology education as a vital part of students' development (ACARA, 2022).

In recent years, Finland has made significant investments in digital infrastructure for education, including cloud computing, online learning platforms, and high-speed internet connectivity, as digital transformation has gained importance in the country (UN, 2021). China, Singapore, and Macao were the top three countries in 2018 for the digital reading literacy achievement of 15-year-olds, with Hong Kong ranking fourth (OECD, 2019).

South Korea has introduced new initiatives such as the 2022 Revised National Curriculum, the Digital-Based Educational Innovation Plan, and AI digital textbooks to transform pedagogical approaches and equip teachers and students with the necessary 21st-century skills amid the 4th Industrial Revolution. According to a prominent report, "64% of schools in the UK are integrated with technology" (EdTech Assessment Tool, 2022). In the IMD World Competitiveness Digital Ranking 2022 Report, the UK ranked 16th in 2022, up from 10th in 2018, with an overall score of 86.45 (IMD, 2022). With the advancement of science and technology, nearly all countries are investing in the digitalization of education at both the school and higher education levels to optimize the utilization of human resources in all fields and contributing to the overall development of human capital in a more inclusive and sustainable manner. By integrating digital tools into the learning process, countries aim to equip students with the skills necessary to thrive in an increasingly digital and interconnected world, ensuring that the workforce of the future is well-prepared to meet the demands of the global economy.

Review of Related Literature

The rapid advancement of technology has brought about a revolution in education, and this is also true in India (Chakrawarty & Pallai, 2024). Luvy, (2018); Madhale, (2018) examined the digital India program has been started with the aim of changing the nation into a digitally enabled society. In the study of Jhangiajh et al., (2020), number of applications such as digital locker, SWAYAM, e-scholarship, digital libraries and internet facilities become much popularized in our country. Setiawanet al., (2020); Khan, (2021); Olayemiet al., (2021) studied on the perceptions of students towards online learning. Most of the students show positive attitude towards online learning method of education. Bano & Vasantha, (2020) conducted a study and found that several initiatives started by Government of India under 'Digital India' and 'Make in India' in education system that includes SWAYAM courses, e-pathshala, SWAYAM PRABHA, e-vidhya and National Digital Library of India (NDLI) that bridge the gap of employability skills, to improve the quality of education and also promote the digital literacy and socio-economic development. SWAYAM is a method of "online and self-learning," which means it offers opportunities for lifetime learning (Paul et al., 2018). Tajik & Vahedi, (2021) studied

on e-learning education through SWAYAM courses and found out that enrolment under such courses is increased day by day. Maharaj, (2018) write a report that highlighted the contribution of e-PG Pathshalain the advancement of e-learning and also investigated the knowledge, application, and impressions of the E-PG Pathshala programme among students. The education sector is witnessing increased use of information communication technologies in teaching, learning, and administration processes (Nivetha & Radha, 2024). NDLI is anticipated to bring about a paradigm shift in the education movement. The current state of electronic thesis and dissertations at Indian university libraries and Shodhganga was highlighted by Das & Saikia, (2014). They believed that open access platforms for electronic thesis and dissertations will boost the rate of research, make it easier to gather necessary data and knowledge, and benefit all academic groups.

Many developing nations, like India, are better positioned to disregard the outdated models that were previously used in developed nations like the USA and take advantage of the most recent developments, like the hybrid model, the inclusion of novel and unusual subjects, gamification, peer-to-peer learning, and profile mapping. Future of the nation will be dominated by automation, artificial intelligence, and advanced technologies. To live and prosper, the next generation of employees and citizens will need to be proficient in a wide variety of technology (Gabriel et al., 2022). Therefore, there is an obvious need for excellent technology integration in schools to assist mould and develop the necessary abilities (UNESCO, 2020). Active online learning approaches, Moodle/H5P activities, AI (OECD, 2020; Vander Vlies, 2020; Xie et al., 2020), AI-assisted Learning Management Systems (LMS), and virtual reality training all improve the courses (Gonzalez et al., 2025). By using these tools, teachers can create learning environments that are tailored to each student's needs (Bower, 2019), increasing student engagement and efficacy (Almaiahet al., 2020; Radianti et al., 2020; Zhou, 2020). Preparing teachers to take advantage of the complexities of contemporary educational technologies is important (Zawacki-Richter et al., 2019). With the support of live lectures, office hours, and group collaboration, video conferencing platforms like Zoom and Google Meet have become indispensable for in-the-moment interactions (Bower, 2019). An online approach recognizes how digital engagement is changing and how it may be used to create immersive learning environments. According to Simonson et al. (2019), online education prioritizes structured material distribution over interactive learning processes. Bond et al. (2021) also explained the significance of pupil engagement in blended and online learning, with a focus on meaningful interaction and active learning techniques.

Dhas, (2017); Fouzdar & Behera, (2017) Gupta & Sharma, (2018); Konwar, (2017); Periasamy, (2019); Sharma, (2018); Thakkar & Joshi, (2017) were studied the attitude of students toward e-learning. These students were belonging to the different fields of education like engineering, arts,

B.Ed. and sciences. Their study has found that most of the students showed positive attitude towards e-learning. In the study of Verma & Nigam, (2024) showed that thecritical success factors play a major role in shaping positive attitudes of students towards e-learning. Singh, (2021); Subediet al., (2020); Unger & Meiran (2020) studied the impact of e-learning on the teaching-learning process. They found that while using electronic media, students as well as teachers faced various problems related to e-learning. They all showed positive attitude towards e-learning and ICT integrated classrooms (Setua & Yadav, 2024) but problems like slow internet facility, lack of knowledge regarding use of online media, absenteeism of student from online classes, lack of interaction, problem of electricity, unavailability of subject matter, online evaluation, health issues like headache, non-seriousness of the students etc were prevailing during online classes. These problems make online education ineffective in nature. Harini & Verghese, (2021); Pandey & Kiran, (2021); Srivastava & Dave, (2021) studied the various challenges and acceptance level of online learning by students. Internet services, lack of concentration, technophobia, misuse of platform, abuse and cyber bullying were affected the online learning process**.**

Objectives of the Study

1. To study the various digital initiatives used by the students of University of Jammu.
2. To study the efficacy of digital initiatives used by the students of University of Jammu.
3. To obtain suggestions from students of University of Jammu for improvement of digital components.

Research Questions of the Study

1. What are the various digital initiatives used by the students of University of Jammu?
2. What is the efficacy of digital initiatives used by the students of University of Jammu?
3. How do the students perceive the digital initiatives?

Research Methodology

The present research was descriptive in nature. In the present study, the population was comprised from all the 36 departments of the University of Jammu. For the collection of relevant data, sample was selected from 20 departments out of 36 departments of University of Jammu by using simple random sampling technique. After that, 10 students were randomly selected from each of the 20 selected departments. Thus, 200 (10 x 20) post graduate students were included in the sample. In the present study, the investigators employed an interview schedule for collecting relevant data from participants. The interview schedule (consists of 45 items) was designed to collect in-depth insights related to various digital initiatives, their efficacy and effectiveness in the process of learning among

students of University of Jammu. Items covered a wide range of topic related to prominent digital platforms and resources such as SWAYAM (providing free online courses from Indian universities), Swayam Prabha (40 DTH channels offering educational content), online education platforms like YouTube, WhatsApp, Google Meet, Google Classroom, Zoom, Telegram, and Skype, as well as platforms like e-PG Pathshala (offering postgraduate courses), the Shodhganga portal (repository of Indian theses), the NAD portal (for digitizing academic credentials), NDLI (National Digital Library of India), and also addressing the various challenges such as technical issues, accessibility barriers, and gaps in content delivery that students faced while using these digital initiatives. After collection of required data and the same has been analysed with the help of percentage. There were some open ended items requiring description, were scored and analysed accordingly.

Main Findings

In the present, it was found that the students showed positive attitude towards digital initiatives in higher education system. They were very comfortable to use various technologies in their learning process. During pandemic, these initiatives were proved as a boon in education system and also saved the academic achievements of the student by continuously providing facilities that were helpful for completing their academic session. Students used different platforms for their learning process. This approach is helpful in obtaining maximum learning outcomes.

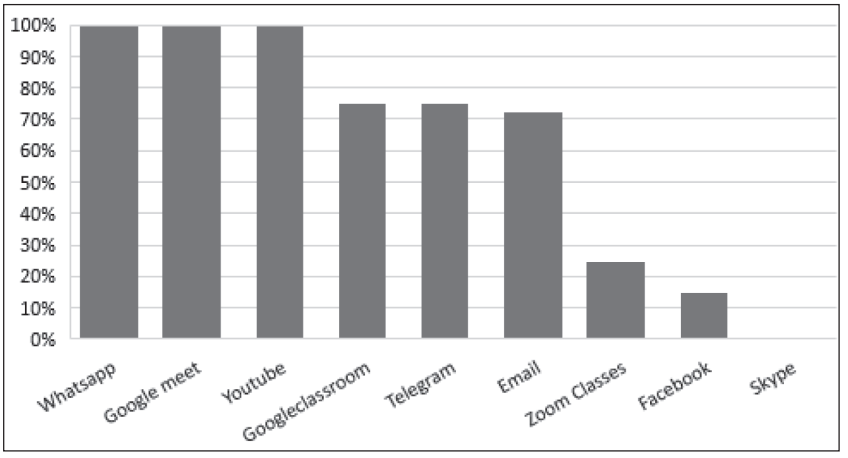


Fig. 1. Percentage of Online Applications used by the students

The figure 1 shows that out of 200 respondents, 75% used google classroom, 72.5% used email, 0% used skype, 100% used Youtube, Whatsapp and Google meet, 25%used zoom classes, 15% used

Facebook and 75% used telegram for their online education during pandemic. Data indicates that WhatsApp, YouTube, and Google Meet had a 100% usage rate among the respondents highlights their crucial role in facilitating online learning during the pandemic. This data also reveals that majority of students adapted to a variety of online tools to support their education, with each platform offering different functionalities—whether for communication, content sharing, or virtual meetings. The wide use of these applications reflects the growing importance of digital platforms in the education sector, especially in times of crisis when traditional classroom learning was not possible. According to the study of Nivetha & Radha (2024), use of Instagram, WhatsApp, and YouTube is higher than that of well-known social networking sites like Facebook and Twitter.

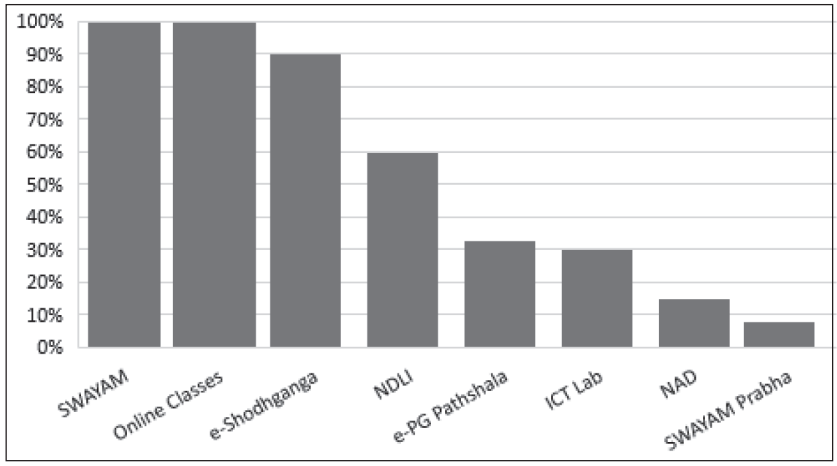


Fig. 2. Percentage of Digital Initiatives Used by the Students

The figure 2 shows that out of 200 respondents, 100% used SWAYAM platform, 100% used online classes for their education during pandemic, 90% used e-Shodhganga, 60% used NDLI, 33% used e-PG Pathshala, 30% used ICT labs in their course work, 15% used NAD and 8% used SWAYAM Prabha DTH channel. Students used SWAYAM online courses and e-Shodhganga widely. It has been found that the SWAYAM platform is quite famous among students of the University of Jammu and there is a 100% enrolment of students under Swayam courses. e-Shodhganga was also widely used by the students for their research work in their post-Graduate programme. This means that students are interested in using different digital platforms for their learning process.

Table 1 Efficacy of the Digital Initiatives in Higher Education

Efficacy of Digital Initiatives	Percentage
Provide a variety of courses	94%
Provide a best teaching-learning resource	81%
Provide a certificate after completion of course through SWAYAM platform	100%
Availability of open choice courses	72.5%
Availability of thesis and research work	88%
Covering all the subjects	85%
E-content prepared by the experts	74%
Easy to find topic	37.5%
Cover wide range of subject matter	50%
Use of easy language	47.5%
Systematic arrangement of the e-content	49%
Increase creativity	55%
Increase competency	75%
Accessible from anywhere and anytime	85%

There are a number of the advantages of the digital initiatives but some of them are depicted in the table 1 showing the efficacy of digital initiatives in the Higher education. It has been found that due to number of the benefits associated with the online educational platforms, students are willing to continue their education through online medium. These platforms have an advantage of variety of e-content, easily availability of it, can be access from anywhere and anytime, providing a best learning experiences, covering all the subjects either technical or non-technical, increase competency, creativity and intellectual capacity of the students.

Table 2 Problems Faced by the Students while Using Digital Initiative

Problems Related to Digital Initiatives	Percentage
Lack of proper infrastructure	90%
Websites are not working properly	87.5%
E-content is not systematic arranged	78%
Proper internet facility is not available in university campus	72%
Far flung areas have electricity problem	60%
Lack of motivation	75%
Lack of interest	65%
Too lengthy subject material	72.5%
Lack of proper gadgets that supports these education portals	65%
Registration problem	85%

Lack of face-to-face interaction with teacher	90%
Health issues	92.5%
Ineffective presentations in video lecture	82.5%
Time mismanagement	87.5%
Lack of awareness	83%

Table 2 shows the number of the problems faced by the students while using digital initiatives. Majority of the students faced problems related to the working of the websites, registration under some portals, lack of infrastructure, ineffective video lectures, lack of face-to-face interaction, lengthy subject material etc. At individual level, students also faced problems like lack of motivation, lack of awareness, time mismanagement, health issues, lack of interest etc. These are some challenges that act as a reluctant and hindrance in the way of 100% implementation of these initiatives in the education system.

Table 3 Suggestions for Strengthening the Digital Initiatives that Started in the Field of Education System

Suggestions	Percentage
Providing proper infrastructure	85%
Providing internet facility with good speed	82.5%
Face to face interaction	85%
Update the portal	90%
Systematic arrangement of the e-content	77.5%
Aware the students	82.5%
Coordination between students, teachers and stakeholders	71%
Role of teacher in popularising these digital initiatives	75%

The above table 3 shows the various suggestions given by the students for improving the working of the digital initiatives. Lack of infrastructure is one of the major issues. There should be an installation of proper equipment and infrastructure that supports such initiatives. Internet is the only way to connect with such platforms. There should be a good internet facility that supports the good connectivity. Such online platforms should be updated time to time. There should be a seminar programmes, awareness campaigns, workshop etc. for popularising such initiatives among students.

Discussion of the Results

On the basis of the findings of the present study, students have adopted the digital components for carrying out their learning process in efficient way. Govt. of India has started a number of digital initiatives. Students showed a positive response towards SWAYAM, Shodhganga portal, online

education and National Digital Library. Moreover, SWAYAM portal is very popular among students. But there are problems related to equipment, infrastructure, lack of interest, lack of awareness towards digital initiatives (Barik, 2022), lack of motivation, internet facility (Verma & Verma, 2022) effect the cent percent implementation of the digital education. The government has invested substantial financial resources in the development of various digital platforms aimed at enhancing education and providing accessible learning opportunities for students (Olayemi et al*.,* 2021). However, despite these efforts, a significant challenge persists: many students are not fully aware of these initiatives or how to utilize them effectively (Sk & Sain, 2024). This lack of awareness limits the potential impact of the government's investments, resulting in all the efforts become vain. As a consequence, the intended benefits of these digital platforms, such as improved access to educational content and enhanced learning experiences (Kumar & Shobana, 2024), are not being fully realized, undermining the success of these initiatives (Gupta, 2023 and Tunga, 2023). The study also revealed that students have little knowledge related to the working of different educational sites like e-PG Pathshala, National Digital Library, SWAYAM Prabha and National Academic Depository. The present study also revealed the lack of infrastructure (Madhavi, 2024) that support computer lab, SWAYAM Prabha set up, smart classrooms effect the digitalization of education in the higher education institute. All types of educational institutes should popularize the digital platforms through seminars, workshops and orientation courses (Das, 2023; Unger & Meiran, 2020), so that students get knowledge related to these digital platforms and they are able to avail their facilities optimally (Gawande, 2020; Zawacki-Richter et al., 2019). In the study of Verma and Nigam (2024), it has found that students who receive active university support in the area of e-learning are more likely to have a favourable attitude about it.

Implications of Research Findings in the field of Education

1. Technology offers students quick access to knowledge, rapid learning, and enjoyable opportunities to put what they have learned into practice.
2. It allows them to gain insight into difficult concepts and explore new topics.
3. It is possible to employ technology in order to create individualized learning strategies for each learner.
4. Teachers can use technology to boost productivity, apply practical digital tools to promote student learning opportunities, and boost engagement and support from students
5. Technology can also help schools save money on physical teaching aids, improve the effectiveness of their educational initiatives, and maximize teacher productivity.

Conclusion

Over the years, technology has become increasingly noticeable in every industry and the impact of digital initiatives on educational institutes has made a remarkable revolution in the advancement of education system. Now-a-days, students are adopting various methods to improve their academic records and they also looking for easier way to study. Digital initiatives that are started for the advancement of the education system has shifted the paradigm from traditional way of education to online and blended mode of education. Different technological tools like computers, smartphones

and internet facilities are used for teaching-learning process. All the efforts in education system worked for the betterment and advancement of the education. The information gathered by the study have the potential to work for the advancement of the technology in the field of education. The present study also provides the ground for the future research that enable the policymakers, administrators, teachers and students to optimum utilize the digital initiatives and also overcome the different challenges that hinders the cent percent implementation of the digital initiatives in the institutes.

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