



Digitalization of higher education in India: Positive aspects and challenges

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Abstract

Digitalization has significantly transformed the facilitation of learning in higher education. It has established a novel approach to learning and providing education to persons with diverse requirements. Digitalization has created opportunities for individuals who previously lacked access to education. This chapter analyzes the digitalization of higher education in India. The chapter is based on a comprehensive evaluation of available research studies addressing many facets of educational digitalization. The chapter provides an overview of five phases of digitalization that enhance education, focusing on the beneficial elements of digitalization in higher education. Significant attention is afforded to the obstacles encountered by educators and learners in the process of digitalizing higher education in India.

Keywords: Digitalization, Higher Education, Online Instruction, Educators, Learning.

Introduction

The digitalization of higher education has garnered significant interest worldwide because of its potential to bring about positive transformations in the lives of internet users. Transformations in the provision of education, the creation and distribution of content, the interactions between teachers and students, and the shaping of learning experiences (Viberg *et al.*). The emergence of technology has led to an increasing integration of learning that is self-paced, enabling learners to acquire the knowledge they seek with reduced constraints of time and cost (Woolfitt1-49). The digitalization of higher education can be analyzed through the lens of processes and the various aspects involved in providing quality education to diverse groups of learners. The process may encompass virtual counseling sessions, guidance regarding programs and courses available at different institutions, online engagement during sessions, administration of online quizzes, assignments, and examinations, as well as diverse methods of ongoing and final evaluation of learners' performance. A different viewpoint on the digitalization of higher education involves providing quality education to diverse groups of learners in a continuous and flexible way (Tømte). Furthermore, digitalization allows educational institutions to utilize administrative solutions, extensive storage for research data, learning management systems, digital libraries, and facilitate both synchronous and asynchronous learning modes (Andryukhina116-147).

The availability of self-paced learning and free educational programs has proven to be a significant advantage for individuals seeking to resume their education after a hiatus. Digitalization connects educators and learners by leveraging technology and scientific principles, creating a shared platform for interaction. Knowledge can be shared effortlessly, free from any physical or mental constraints that might obstruct the learning journey.

Literature Review

In July 2015, the esteemed Prime Minister of India, Shri Narendra Modi, launched the Digital India initiative, aimed at enhancing digital literacy and ensuring internet access for all citizens, in order to keep pace with the rapidly evolving

global economies. The focus on digitalization highlights the integration of digital technology, computer software, the internet, and ICT-enabled tools to enhance traditional work practices. This pertains to the shift of the entire economy towards a digital framework. The advancement of technology has significantly changed the methods of imparting knowledge to students (Goswami 78-79). The digital transformation in higher education focuses on utilizing new and innovative data, processes, and technologies in digital formats to ensure accessibility for a broader audience. Online classes, emails, videos, PPTs, and smart classes exemplify digital education, facilitating connections among students from any location at any time (Russow 1-11). The advent of digitalization provides opportunities for learners who previously faced barriers to access. Individuals in remote areas, who may have been disconnected, can now utilize ICT-enabled tools to engage with online content. This also enables individuals to pursue further education, which is essential for enhancing their skills and advancing in their careers (Telukdarie 716-729).

Objective of the Study

The present chapter focuses on analyzing the digitalization of higher education within the Indian context. This is an effort to analyze the significant transformations in higher education resulting from the influence of digitalization. Numerous methods facilitate digitalization, and several prevalent practices within higher education have been examined. Another significant goal is to thoroughly examine the positive elements of digitalization alongside its challenges within the realm of higher education.

Methodological Approaches

The exploratory study has been conducted to examine the digitalization of higher education within the Indian context. The alterations resulting from digitalization have been meticulously analyzed through the data gathered from secondary sources. The study builds upon several prior articles published in reputable journals, while also incorporating online news articles to provide a comprehensive understanding of the digitalization of higher education. The study has systematically examined the

various forms of digitalization and how it has assisted at every stage of learning, from gathering information to the final assessment of students' performance. The literature survey has enabled the acquisition of systematic data regarding the digitalization of higher education in India, focusing on the facilitation of education, delivery methods, and assessment of learning outcomes. The literature survey has also assisted in identifying the constructive aspects of digitalization in higher education, as well as the challenges that may arise in the successful execution of learning.

Findings of The Study

The study encompasses extensive insights into the importance and flexibility of Digitalization within the education sector over recent years. The findings encompass the methods currently employed to promote higher education, the constructive elements that facilitate learning, and the challenges encountered during the transition to digital education.

Five stages of digital education in higher learning The five key phases outline the journey of a student in pursuing higher education within the context of digitalization and ICT-enabled learning.

a. Online Counseling

The primary concern for students pursuing higher education is the need for adequate guidance and counseling. Guidance assists students in revealing concealed opportunities and offers essential direction to excel in the specific field they are passionate about. The higher educational institute provides a range of counseling programs through multiple online platforms such as Zoom, Google Meet, and Microsoft Teams, assisting individuals in selecting from the diverse career options available. The counselor offers comprehensive insights into the available courses and their relevance for enhancing career prospects. This virtual counseling aids individuals in determining their areas of interest for future academic and career objectives (McKenzie 284-288).

b. Orientation of Students

The subsequent phase of digital learning involves the orientation of students within an educational institution. The advancement in technology and artificial intelligence has significantly transformed the onboarding process for students. The government of India has implemented the New Education Policy (NEP), emphasizing the importance of digital and technological education (Grosbeck 565-581). Contemporary higher educational institutions are increasingly prioritizing the implementation of virtual induction and orientation programs for newcomers. This phased approach enhances their foundational understanding of the journey ahead, thereby facilitating the processes for both students and educational institutions. A well-structured application for institutes encompasses comprehensive information regarding its operations, the courses available, the chat process, attendance tracking, academic standards, safety regulations, and the feedback and evaluation system. This technological support enhances clarity and transparency concerning the orientation program. The advancement of digitalization has fostered a novel academic landscape, featuring online campus tours facilitated by mobile applications. This virtual orientation is designed to familiarize students with the institution and outline the subsequent steps necessary for their learning journey (Mah 285-305).

c. E-learning and Teaching

The subsequent phase in the evolution of digital learning within higher education is E-learning. Embracing change will facilitate adaptation to emerging technologies and innovations within the education sector. The approach to teaching has undergone significant transformation due to the introduction of electronic tools and a variety of online platforms that offer wireless access. Through an analysis of student needs across various levels, numerous organizations and government institutions have initiated specialized courses that cater to individual interests in specific areas. Certified courses are available that maintain strong relevance to various academic disciplines. Smart classes have been introduced, fully equipped with technology and online libraries that facilitate easy access to digital content. Numerous universities at this point in time have transitioned to blended learning, webinars, MOOCs (Massive Open Online Courses), and fully online instruction utilizing applications and platforms such as Zoom, Google Meet, Microsoft Teams, and others. Blended learning demonstrates significant effectiveness by educating students through both online platforms and traditional face-to-face instruction. Online education proves to be highly effective in extending access to those areas where traditional educational institutions are unable to reach; the rural population significantly benefits from this approach. Remote education enables learners to acquire knowledge from diverse sources, regardless of their location. The students' comprehension of power concerning the specific topic also enhances when it is taught through the use of artificial intelligence, augmented reality, and digital tools. Online learning enhances the convenience and accessibility of education for educators and learners alike (Arkorful 29-42).

d. Content Sharing

The subsequent phase in the evolution of digitalized learning within higher education involves the dissemination of content. Lectures are insufficient without the inclusion of pertinent reference and practice materials for the learners. Institutions are disseminating study materials via their Learning Management System, email, study groups, and various other channels to enhance both pre and post-class learning experiences. The practice assignments are shared between the educator and learners in an online format, removing the constraints associated with traditional pen and paper tasks (Price 222-227). Higher educational institutions provide an online library that students can conveniently access at any time and from any location. Digital education has facilitated a more streamlined and coherent exchange of ideas between students and teachers.

e. Feedback System

Feedback and evaluation hold a significant position within an educational framework. In the absence of an appropriate evaluation system, it becomes impossible to assess the performance of learners effectively. Previous examinations were administered in a traditional format with oversight from an invigilator. The digital transformation in education has led to the emergence of diverse new methods for administering examinations online. The establishment of online exam portals aims to deliver a user-friendly software and application designed to minimize the time and effort needed for conducting examinations and tests. MERCER

mettl and EMPOWER Test Prep serve as examples of web-based online assessment portals. These platforms are comprehensive, cloud-based software solutions that facilitate the creation, proctoring, and reporting of exams conducted online (Alessio146-161). Online portals maintain comprehensive oversight during proctoring, providing a 360-degree view, utilizing students' unique identification numbers, and assisting invigilators in monitoring every activity of the student. The advent of digitalization has significantly transformed the methods of conducting assessments, enabling a robust two-way feedback mechanism within the contemporary digital framework (Franki).

Positive elements of digital transformation in tertiary education

Access to Remote Learning-

The primary advantage of digitalization in higher education is that participants can access it from any location at any time. The participants are able to maintain connectivity and access the online learning materials from a distance. Students can easily select and download it at any time from the relevant sources, which has made the acquisition of knowledge more convenient for them and encourages their pursuit of higher education (Azubuike). In the past, delivering education in remote areas faced significant challenges due to limited technology and the absence of necessary resources. The Government of India is currently emphasizing digitalization across various sectors, and the education sector is actively embracing digital technology, leading to advancements in education within rural areas. Students from rural areas now have the opportunity to pursue their education and complete higher studies at a minimal cost, which is highly advantageous. The advent of online study materials, virtual classes, and digital payment methods has transformed the educational landscape from traditional classrooms to a digital platform. This will ultimately enhance the education and employment rates within the overall economy (Amin 362-378).

Combination of Real-Time and Self-Paced Learning-

The entire process of digital transformation in education is being implemented gradually; it is not the outcome of efforts concentrated in a single day. Transitioning from traditional teaching methods using PPTs and projectors to fully utilizing digital platforms has significantly improved student connectivity. The new approach of hybrid learning has been implemented, allowing participants to join in person or virtually from any location that suits them. Instructors can effectively deliver their lectures to both groups using various available platforms such as Zoom, Google Meet, Google Hangout, WebEx, and others (Chaeruman 1 5). These applications provide both a tangible and digital experience of the classroom, equipped with various features that enable students to address their questions and establish their virtual presence. Alongside live classes and synchronized learning, there is a notable rise in asynchronized learning methods. Educators utilize recorded audio, video, and podcast materials from their lectures, allowing participants to engage with the content at their convenience and according to their available time. Coursera, edX, LinkedIn Learning, Swayam, and others are platforms providing certified courses from top instructors. These education platforms are highly regarded; they provide

significant assistance to participants, such as working professionals, who struggle to find time amidst their demanding schedules. It offers the opportunity to learn without any constraints on time. Numerous prestigious institutions, such as IIMs and IITs, are providing their courses on these platforms to enhance the skills of the nation's young and talented individuals (Szeto).

Independent study

The allocation of time is a crucial factor in the process of acquiring knowledge and education. Participation in a specific learning program simultaneously can pose challenges for various individuals. In the past, participants were required to pursue higher education according to the guidelines and timelines set by the instructor; classes were held in a designated physical location at specific times. Nevertheless, the digital age offers increased flexibility in learning schedules (Tan 250-262). The advent of online classes and self-paced courses has effectively addressed numerous constraints associated with traditional education concerning time and location. Numerous courses are adopting recorded teaching sessions, along with videos and podcasts. This approach offers participants the convenience to pursue higher education according to their own time flexibility. This approach alleviates the responsibilities of educators, allowing them to focus on communicating the process and requirements of the session rather than constantly monitoring participants' activities (Revyth2341-2355).

Engagement of Students-

Engaging students and involving them in academic activities has historically posed challenges for educators in a physical classroom environment. Students often perceive the learning process as repetitive due to the consistent methods employed. The transformation of the higher education sector into a digital format has significantly highlighted the importance of engaging an increasing number of students in a creative and captivating manner. This generation's educators are prioritizing interactive study content through various methods. They are utilizing polls during Zoom meetings, exchanging ideas via Google Forms, sharing situational and experimental teachings, and recording engaging online videos and podcasts. Additionally, they are addressing participants' queries promptly and gathering feedback on the overall learning experience. This practice fully engages students and encourages them to perform and learn at their best (Ventanyen).

Evaluation of student performance

The evaluation and grading process of student performance has been streamlined by the virtual world. The overall outcomes from the learning can be systematically summarized through an online manifesto. Online examinations are now practical with the use of different systems and applications such as Mercer Mettl and LMS, which facilitate real-time virtual testing. Additionally, proctoring is implemented to ensure thorough monitoring of participants' adherence to fair practices (Hsia, L. H. 55-71). Digital courses and webinars today provide instant E-certificates to participants, enhancing their engagement levels. Timely quizzes, questionnaires, and polls are highly effective in evaluating the overall performance of participants. This immediate assessment and certification

process assists students in achieving their subsequent academic and professional objectives (Hamann 107-110).

Obstacles in the digital transformation of higher education

Each new innovation and technological advancement brings its own set of challenges. The digital transformation within the education sector demonstrates significant benefits and alters teaching methodologies; however, it also disrupts the consistency of higher education in various aspects, Ensuring the sustained engagement of participants While online classrooms are becoming increasingly common and demonstrate effectiveness due to advancements in technology, they also present challenges for instructors in capturing the attention and participation of students during virtual sessions. The absence of personal and physical connection with the learners is making it challenging for the teacher to maintain their attention beyond a certain threshold. The instructor cannot ascertain during the virtual classes how many students are engaged and demonstrating interest in the current topic of discussion. The engagement ratio of the student is significantly lower when compared to the delivery of sessions conducted in a physical classroom setting. Additionally, there are instances where students attempt to evade interaction and exhibit unusual levels of participation, which hinders faculty from effectively engaging participants beyond a certain threshold. The asynchronous or recorded mode of teaching often results in diminished continuous interest and participation among learners. The flexibility of time can negatively impact the consistency of the teachings (Malinen 228-238). Figure 3 illustrates the challenges associated with the digitalization of higher education (Source: Developed by Authors).

Influence on the standard of instruction

The digital approach to education cannot fully replace traditional classroom instruction. It can serve as a conduit to access areas where traditional classroom instruction is inaccessible. The impact of digital teachings on the quality of education has been significant and profound. The engagement and participation of the students are quite minimal, and there is a lack of a standardized measurement system that would inform the instructor about the level of student involvement (Markova 685-691). It has been observed that many instructors struggle with technology, making it challenging for them to deliver their best quality through online platforms, a stark contrast to their outstanding classroom teaching.

Communication gaps

Face-to-face communication is generally more reliable than digital communication methods. The digital transformation of higher education reveals significant gaps in communication and information exchange between educators and participants. Many educators have frequently noted that the level of understanding among learners varies significantly, leading to discrepancies between what is intended to be communicated and what is actually comprehended. This distortion in communication is further exacerbated by the absence of genuine presence, making it challenging to address the issue effectively. The technology presents certain drawbacks; it is often noted that issues such as audio and video quality, speaker functionality, internet bandwidth limitations, and a lack of resources can hinder

effective communication among individuals engaged in academic endeavors (Richter 1-11).

Variability in the learning process

Students occasionally struggle to maintain continuity with the courses available, as personal circumstances may compel them to withdraw midway, leading to inconsistencies in their learning (Lee 448-454). Flexible learning hours present several challenges; participants often fail to engage fully during the designated time, resulting in a limited understanding of the material. The transmission of information and guidance by educators also differs between online and offline formats. At times, the transmission of knowledge from the instructor may be hindered by the challenges associated with online learning environments. The scheduling of digital sessions occasionally occurs in the gaps, which impacts the consistency of the planned lectures. In digital education, learners exhibit reduced attention levels when compared to traditional classroom instruction (Scutelnicu *et al.* 274-292).

Implications of the chapter for study

The current chapter can provide a clear understanding of the digitalization of higher education within the Indian context. This provides insight into digitalization, its processes, and the ways in which it can enhance the education sector across various stages of learning and the delivery of quality education. It presents both the beneficial elements and the obstacles associated with the digital transformation of higher education.

This can assist educators, such as instructors, educational institutions, evaluators, and other supportive staff, in comprehending the various stages at which digitalization can be integrated to enhance educational programs and courses. It is beneficial for educators to gain insight into the capabilities of digital and ICT-enabled tools for enhancing content delivery and refining teaching methods.

The study provides valuable insights for learners in examining the potential of digital tools and their role in facilitating knowledge creation and sharing, all while minimizing barriers to learning. It is important to consider the positive elements while engaging in any course, and challenges can be reduced by implementing suitable strategies.

Research implication of the study

This study offers a comprehensive examination of the digital transformation occurring within higher education in India. The chapter examines the shift in the education sector from traditional offline methods to online formats, which has become the prevailing standard in contemporary times. The phases of digital higher education are outlined, beginning with online counseling and culminating in the effective online evaluation and feedback of students. The study emphasizes the positive elements of digitalization in higher education, showcasing its role in enhancing convenience, flexibility, and accessibility for individuals, regardless of age, time, or geographical limitations. Conversely, certain challenges have been analyzed that impact the overall quality of knowledge exchange between educators and students. The digital transformation in higher education cannot substitute the experience provided in traditional classroom teaching; however, it can effectively enhance it by adding significant value.

Conclusion

The study has been conducted utilizing secondary research data sourced from various online platforms. New data can be collected directly from primary sources, reflecting the perspectives of both educators and learners. A more comprehensive investigation can be conducted to explore the various aspects of digitalization. The influence of digitalization in higher education can be examined through the lens of enhancing employability and skill development for learners. The investigation has been conducted within the framework of higher education in India. Future studies may benefit from considering a broader context of other geographical regions.

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