

Exploring the scenario of digitize pedagogy and advanced tools in higher educational teaching-learning practices

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Abstract: In the current era, technology-based education is omnipresent in the world, especially in the COVID-19 pandemic. Development in innovative teaching-learning pedagogy includes attentions to numerous tools, techniques, software, mode, content, and other educational resources use in higher educational teaching-learning practices. The design of innovative pedagogy help to improve the quality of learning facilitated psychological theories includes behaviorism, cognitivism, and situated learning. The digitalize pedagogy and advanced tools include video conferencing applications, e-resources, MOOCs, advanced classroom tools. Finally, digitized pedagogical approaches in higher education teaching-learning practices, the role of new educational pedagogy, and advanced tools play a remarkable role in the education system.

Keywords: Online teaching learning, E-content, advanced tools, Innovative pedagogy, Video conferencing

I. INTRODUCTION

Coronavirus pandemic collapsed the whole educational system in lockdown period and challenge entire educational researcher and system of the globe. The digitized technology and advanced tools facilitated online teaching-learning in the whole world (Mishra et al., 2020). Approximately three billion children and adolescents are not in school, college, university, institution due to the SARS-CoV-2 pandemic (Bates et al., 2020). Digitize pedagogy and advanced tools in higher educational teaching-learning practices influential Bloom's Taxonomy to achieve educational goals (Arievitch, 2020). This technology based education measured student outcomes and help to describe their goals by developing their thinking skills assessed into six categories (Stanny, 2016). The current educational system includes modern techniques which often use to educate students and make them to clear, skilled enhanced, and understandable. Now a day use of internet-based technology and tools too more useful to educate the student in simple ways (Crook & Nixon, 2021). The modern tools and technology are more adequate for students and teachers due to their more open, flexible learning technologies and ease of access and utility. The advanced innovative tools and techniques enhance the whole education system, which plays a significant role in development and nation-building (Zachos et al., 2018).

Over the past two decades, there has been a sustained and continuous development in teaching-learning practices. The affordable online teaching-learning provides a forum to teachers, and students by engaging themselves in authentic, fruitful knowledgeable, and healthy interaction (Lock & Redmond, 2021). Video Conferencing Platforms are turn out to be part of routine teaching-learning practice includes google meet, Microsoft teams, zoom meet, WebEx teams, and GoToMeeting, etc. This video conferencing software plays a remarkable role in the online teaching-learning practice in the COVID-19 pandemic (Carrillo & Flores, 2020). E-content is the backbone of digitalize teaching-learning practices such as e-book, e-library, mobile applications, etc. E-content development is a revolutionary step in educational research (Ajegbomogun et al., 2017). MOOCs (massive open online courses) are modern e-learning resourcefulness for widespread in the whole world. These courses are skilled enhanced and free of charge which removed the barrier and boundaries that came across traditional teaching-learning practices (Hew & Cheung, 2014). All aspects of digitize pedagogy and advanced tools in higher educational are illustrated in figure no. 1.

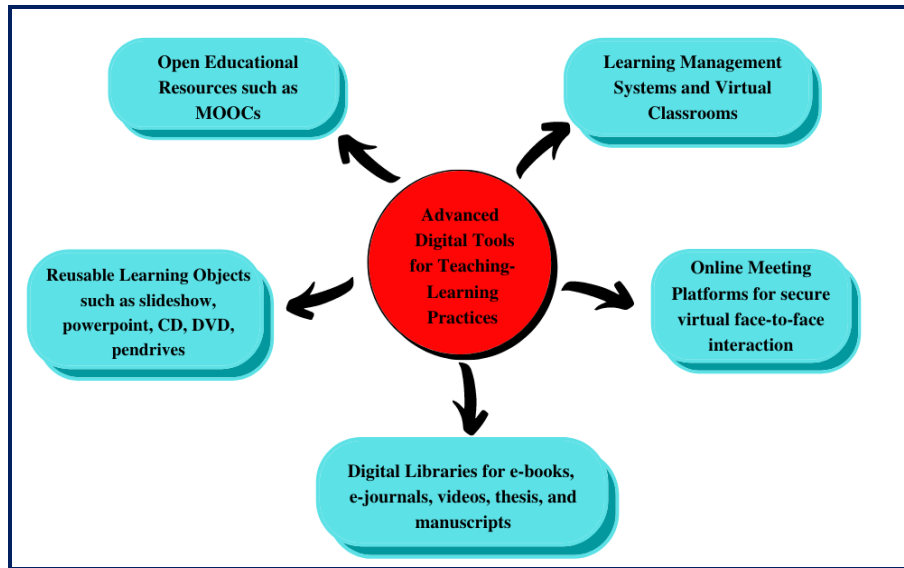


Figure 1: Outline of digitize pedagogy and advanced tools in higher educational

II. ADVANCED E-LEARNING TOOLS

E-learning is a tool designed to reduce the educational limits by availing all educational materials and providing teacher-student interaction facilities anytime, anywhere. The smarter and better delivery of educational outcomes and knowledge than face-to-face learning is an alternative goal of e-learning. These tools are network-based platforms accessible with smartphones, tablets, or desktops. There are numerous e-learning tools that deliver different kinds of courses known as the Learning Management System (LMS). LMS provides smart software and advanced tools that are used to empower the teaching-learning environment by transforming the traditional classroom into digital classrooms with innovative teaching methodologies while balancing a student-centric approach. The system facilitates various academic procedures such as identifying tests, sharing any video, audio, or text contents, providing and evaluating academic tasks, etc. (Fadil and Khaldi, 2020).

2.1 Virtual Classrooms: Moodle and Google classroom

Virtual classrooms refer to an online cloud-based platform where students are engaged with the educational materials provided by respective teachers or mentors using available electronic devices like smartphones or desktops (Hiltz, 1995). Moodle and Google classroom are two of the popular LMS developed for providing time-flexible learning options to students with their suitable pace and place without any interruption to their course. Even these virtual tools allow uploading course content, quizzes, and other curriculum activities with protecting that data, they didn't allow face-to-face interactions. But they can be used for both face-to-face learning environments and fully virtual environments (Vasanth and Sumathi, 2020).

2.2 Moodle

It is an open-source LMS available with its mobile extension of a web-based platform. The system is robust, free to use, and developed with sound pedagogical principles for boosting the global educational environment. Moodle is not only featured for mobile-friendly courses but also allows some offline facilities. The learner can communicate with other participants, see his due activities and assignment status, download course sessions, attempt quizzes, and know their grades. The participants can get notifications of each and every update and upload on their smartphones. Although, Moodle has many interesting features, it takes time to understand and get user-friendly (Moodle, n.d; ALIER et al., 2007).

2.3 Google Classroom

It is also a robust open-source learning platform launched by Google. Google Classroom is said to be the best platform for virtual teaching-learning processes and workflow as it provides a single access point for assigned tasks and discussion threads. Teachers can easily identify and evaluate tests, assignment submission records, and consequently the grades of students as well as store all material over Google Drive. It is a free, mobile-friendly, user-friendly, flexible, and strictly cloud-based platform (Iftakhar, 2016).

Table 1. Comparison of Moodle and Google Classroom (Vasanth and Sumathi, 2020)

Moodle	Google Classroom
Not user-friendly for beginner course creators and enrolling students, need training for designing courses and enrolling teachers and students.	User-friendly for both teachers and learners.
1000+ add-ons for improving and expanding the functionality of the resources.	Only 10 add-ons are available.
Open-source platform and has paid plans for more users than a particular limit.	Institutional registration is mandatory for the education package. The free version has some limitations.
Device-dependent software can create complexities if used in smartphones. However friendly in tablets, desktops, or laptops.	Device-independent platform and can be easily handled on smartphones or mobiles.
Bigger and designed with many options for workflow thus can be used by only experienced or trained users.	Designed in a simple way and suitable for any user.

III. ONLINE MEETING PLATFORMS

The digitalized classroom should also possess student-teacher face-to-face interaction and to fulfill this need video conferencing software such as Google meet, JioMeet, Zoom, and Microsoft teams provide a secure and user-friendly platform for students and teachers. This type of virtual teaching is location-independent as well as device-independent and thus can be suitable for any smartphone and desktop. JioMeet is launched by Reliance Jio which is an absolutely free platform for video conferencing (Kapadia et al., 2020).

Table 2. Comparison of features of online meeting platforms (Kundu, 2020)

Features	Google meet	Microsoft teams	Zoom	JioMeet
Free call duration	60 Minutes	60 Minutes	40 Minutes	Unlimited
Time limit	24 Hrs	24 Hrs	24 Hrs	24 Hrs
Paid plans starting amount	\$10 per month	\$12.5 per month	\$14.99 per month	Free
Security details for video call	Encryption	Encryption	End-to-end encryption	Encryption
Participant limit	250	1000	1000	250

Although these digitized and virtual classrooms have simplified the way of education by mitigating the issues of distance, the students and teachers have to overcome several invisible or inaccessible technological challenges and connectivity issues. The students may also be faced with issues regarding the quality of virtual teaching or the quality of course material (Jagathkar, 2020).

IV. E-CONTENT

Electronic content is digital content that is delivered via network-based electronic devices such as smartphones and desktops. A variety of E-content is available online for aiding higher education. E-content mitigates all challenges related to pace, place,

expense, and real-time learning as it is user-friendly, cost-effective, and remains unaffected by time as well as distance (Shenkar and Muralidhar, 2014).

4.1 Open Educational Resources (OER)

Massive Open Online Courses (MOOCs) is the biggest e-learning tool that provides free or paid virtual sources for thousands of higher academic students simultaneously. MOOC is a valuable tool for distance and higher education systems. This two-way learning tool offers various academic courses with a proper schedule, study material, knowledge documents, special-purpose tools, video lectures with assignments, quizzes, and their proper evaluation process. There are different MOOC platforms launched by various worldwide providers such as Coursera, Udemy, edX, Udacity, Khan Academy, and many more (Staubitz et al., 2015). The government of India (GOI) and the Ministry of Human Resource and Development (MHRD) collectively have taken a step forward to digitize the Indian higher education system by launching free e-learning platforms for students with video content, quizzes, and certificates (Chaudhary, 2020).

4.2 SWAYAM

Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) portal is a type of MOOC, launched under the 'Digital India' campaign by GOI and accredited by various statutory organizations such as UGC and AICTE. All courses offered by SWAYAM do not possess any entrance exam for enrollment and are free of cost. The high-quality courses are designed and delivered by faculties of IITs, IISERs, GUs, IIMs, etc., and accessible with any smart device. SWAYAM PRABHA provides numerous TV channels for different subjects and brings all high-quality contents of SWAYAM in highlight without internet using satellite for ordinary people (Blast, 2019).

Table 3. Courses offered by SWAYAM MOOC (Swayam Central, n.d.).

Programme	Courses
UGC-SWAYAM	Non-technological PG courses
NPTEL-SWAYAM	Technological UG and PG courses
CEC-SWAYAM	Non-technological UG courses
IGNOU-SWAYAM	Diploma, certification courses
NCERT/NIOS-SWAYAM	9 th and 10 th grade courses

4.3 e-PG Pathshala

It is an online portal initiated by National Mission on Education through ICT (NME-ICT), funded by MHRD and GOI, and executed by the UGC. This one of the best e-learning platforms in India that provides high-quality e-text and video contents with illustrations. All PG e-content is designed by subject experts and faculties of UGC granted universities. The academic documents or study material provided by Pathshala are downloadable for offline reading (Maharaj, 2018). This portal has three platforms, which are e-Adhyayan for e-books, e-MOOCs for online courses, and e-Pathya for offline content delivery (e-PGPathshala, n.d.).

4.4 Shodhganga

Shodhganga is an open-access digital repository of Indian electronic theses and dissertations (ETDs) launched and maintained by the INFLIBNET Centre. The reservoir not only allows to access and deposit ETDs but also shows the potential of indexing and disseminating. This is India's central repository, where theses are stored from various PhDs across numerous disciplines. This has led to various kinds of problems from lack of visibility for Indian research to duplication, repetition, and even plagiarism in some cases (Sankar et al., 2015).

4.5 Virtual Labs

Virtual lab portal performs actual lab experiments remotely similar to real-world experiments. This platform provides remote-access-labs based on computer activity for students for interactive screen experiments (Kundu, 2020).

4.6 National Programme on Technology Enhanced Learning (NPTEL)

NPTEL is an initiative taken by IIT institutes to provide engineering, science, social sciences, and humanities-related courses. The portal provides quality courses with certificates (Kundu, 2020).

5 Reusable Learning Objects (RLO)

Reusable learning objects help to build a smart class for making the teaching-learning process more simple and qualitative by providing better education via presentations, videos, and animations. Moreover, the use of digitized learning activities in class increases the learner's interest as well as engagement in the course (Palanisamy et al., 2020).

5.1 CD/DVD

The audio-video tapes, infographics, and animations are easily grasping and student engaging contents, which can be stored in computer hardware such as CD/DVDs or pen drives for their reuse. This hardware are used for teaching all levels of students for engaging students and increasing their grasping power. The content can be delivered in the form of videos, graphics, infographics, and animations for making lessons more interesting. The content can be accessed without the internet using computer desktop or projector screens.

5.2 Slideshow Presentation

PowerPoint presentations are suitable for both face-to-face and online interaction. Powerpoint is used by teachers for enhancing lessons or asking students to deliver reports in slideshow format. This facilitates both verbal and pictorial models of learning. Nowadays these are commonly used instead of the 'chalk and talk' method of teaching for both face-to-face and virtual teaching-learning activities (Almar'beh et. al., 2015).

6 Digital Libraries

The digital resources of books and journals are also available online by GOI, MHRD for aiding higher education systems.

6.1 e-Shodhsindhu

e-Shodhsindhu is a move of GOI towards building India's National Electronic Library with e-journals and e-books. This tool provides access to e-contents like e-books, peer-reviewed e-journals, e-journal archives, factual databases with their bibliographies and citations for higher education. e-ShodhSindhu is the biggest Consortium in India, which covers University Libraries and 157 universities in India and provides subscription-based scholarly information to all educational institutions (INFLIBNET, 2016; Gupta, 2017).

6.2 NDLI

National Digital Library of India is launched under NME-ICT for providing e-content such as e-books, videos, thesis, and manuscripts to students, teachers, and professionals (Kundu, 2020). This library is a secure source of articles, which can be easily accessed from anywhere, at any time, and provides full-text search of even endangered documents due to physical decay (Bhat et al., 2017).

V. CONCLUSION AND FUTURE PERSPECTIVE

The digitize technology and advanced tools application in higher education helps to Liberalization, Privatization, and Globalization of the educational system. These tools and techniques help to exchange programs of academic activities among the countries. These technology applications in higher education help to improve the quality of the education and nation-building process. Because the entire education system of India is dependent on online mode. The online teaching-learning pedagogy is a revolutionary step in the educational system, the educational system in the COVID-19 pandemic sustained due to digitizing pedagogy and advanced tools. Digitize tools and innovative technology are the future of the entire educational system.

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